JULY/AUGUST 2019

ENGINEERING INC.

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AWARD-WINNING BUSINESS MAGAZINE • PUBLISHED BY COMPANIES

USAID ADMINISTRATOR MARK GREEN

Expanding international collaboration with engineers

Defending the Impact of Cyberattacks

Member Firm Innovations in Flood Mitigation

RETTEW's 50 Years of Community Support

ACEC
American Council of Engineering Companies

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2019 FALL CONFERENCE

October 13-16, 2019

Sheraton Grand Chicago

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DEPARTMENTS

COVER: GARY LANDSMAN

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ACEC's award-winning bi-monthly magazine *Engineering Inc.* provides expert analysis on all issues affecting the overall business of engineering. Other highlights include in-depth interviews with major policy makers whose decisions impact bottom lines; updates on critical advocacy issues and industry news, best practice management trends and marketplace projections, along with member firm innovations and announcements.

New Survey Yields Valuable Member Feedback

Results of the just-released 2019 ACEC Membership Survey reveal a strong and loyal core of members who find significant value in their ACEC membership, approve of the Council's overall direction and believe the Council is making positive gains to improve programs and services.

The survey also underscores areas where the Council needs to improve. The good news is that we are already taking steps to address them.

Conducted in March, the survey provides vital information that can be put to immediate use in reinforcing our mission, enhancing communications with members and increasing the value of membership.

The results also provide a foundational understanding of ACEC membership, which has been so valuable in the development of the soon-to-be completed new strategic plan *(see page 40)*.

We are encouraged by the exclusive *Engineering Inc*. interview with U.S. Agency for International Development Administrator Mark Green, who emphasized his goal to increase collaboration with engineers on new global development opportunities *(see page 12)*.

Also included is a special report on why protection against a crippling cyberattack involves not only the latest technology but also the careful analysis of your risk management portfolio to assure cybersecurity coverages are adequate *(see page 22)*.

The warm days of summer are finally upon us and so is vacation season. No matter what your plans, here's hoping for a safe, enjoyable and memorable summer season for all.

Mitchel W. Simpler
ACEC Chairman

Linda Bauer Darr
ACEC President & CEO

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Increasing Demand, New Technology Prompting Surge in Battery Storage Market

By Gerry Donohue

In March, Florida Power & Light (FPL) announced that it will build the world's largest solar-powered battery system. When it comes online in 2021, the FPL Manatee Energy Storage Center will provide 409 megawatts (MW) of electricity. Chances are, though, by the time you read this article, another energy company will have announced plans to build an even bigger storage battery. Maybe more than one.

"It seems like every few months we hear of plans for the next world's biggest battery," says Joe Fox, director, power market at Ulteig Power. "This is a very exciting time to be in this sector."

Fueled by increasing demand from utilities, independent power producers, companies looking to cut energy costs and rapidly developing technology that is reducing battery storage costs at a remarkable pace, the battery storage market segment is on a major upswing.

In 2018, U.S. energy storage deployments totaled 311 MW, up 44 percent from the year earlier, according to the U.S. Energy Storage Monitor Year-in-Review, a report by Wood Mackenzie Power & Renewables. Wood Mackenzie forecasts that annual U.S. energy storage deployments will reach 4.4 gigawatts by 2024.

"The market is exploding," says Mike Voll, global sector lead for smart technologies at Stantec. "We expect the global segment to continue to grow at double-digit levels over the coming years."

Bloomberg New Energy Finance projects in its New Energy Outlook that by 2050, 50 percent of all global power generation will come from wind and solar

RIDING THE RENEWABLE WAVE

Three factors are driving the growth of the battery storage market.

First, battery storage has a symbiotic relationship with the rapidly expanding renewable energy market.

According to the U.S. Energy Information Administration (EIA) non-hydroelectric renewable energy sources, including solar and wind, will be the fastest growing source of U.S. electricity generation for at least the next two years. EIA forecasts that utility-scale solar generation will grow by 10 percent in 2019 and 17 percent in 2020, with wind generation growing by 12 percent and 14 percent, respectively.

Looking longer term, Bloomberg New Energy Finance (BloombergNEF) projects in its New Energy Outlook that by 2050, 50 percent of all global power generation will come from wind and solar. Hydro, nuclear and other renewables will account for an additional 21 percent. Natural gas, coal and oil will account for only 29 percent of electricity production, down from 63 percent today.

As a result, BloombergNEF's Seb Henbest says in the report, "We see $548 billion being invested in battery capacity by 2050, two-thirds of that at the grid level and one-third installed behind-the-meter by households and businesses."

Second, the price of lithium-ion batteries, which have accounted for most battery storage systems installed since 2015, has fallen precipitously.

"With manufacturers producing lithium-ion batteries at scale for electric vehicles and other applications, they have pushed the price point down to where the business case for larger-scale storage projects is easier to pencil out," says Fox.

A BloombergNEF analysis reported that the benchmark levelized cost of energy (LCOE) for lithium-ion batteries has decreased by 35 percent since the first half of 2018. LCOE measures the all-in expense of producing a megawatt-hour (MWh) of electricity from a new project, including the costs of development, construction and equipment, financing, feedstock, operation and maintenance.

"Batteries co-located with solar and wind projects are starting to compete, in many markets and without subsidy, with coal-and gas-fired generation for the provision of 'dispatchable power' that can be delivered whenever the grid needs," according to the analysis.

"There are numerous applications for utilities," says Fox. "They may be looking to modernize their grid or improve grid reliability, or they can use storage to defer the need to upgrade infrastructure."

Third, the regulatory landscape is rapidly changing in favor of energy storage.

In 2018, the Federal Energy Regulatory Commission issued two orders that will promote the increased use of storage in the transmission grid. Order 841 removes barriers to energy storage

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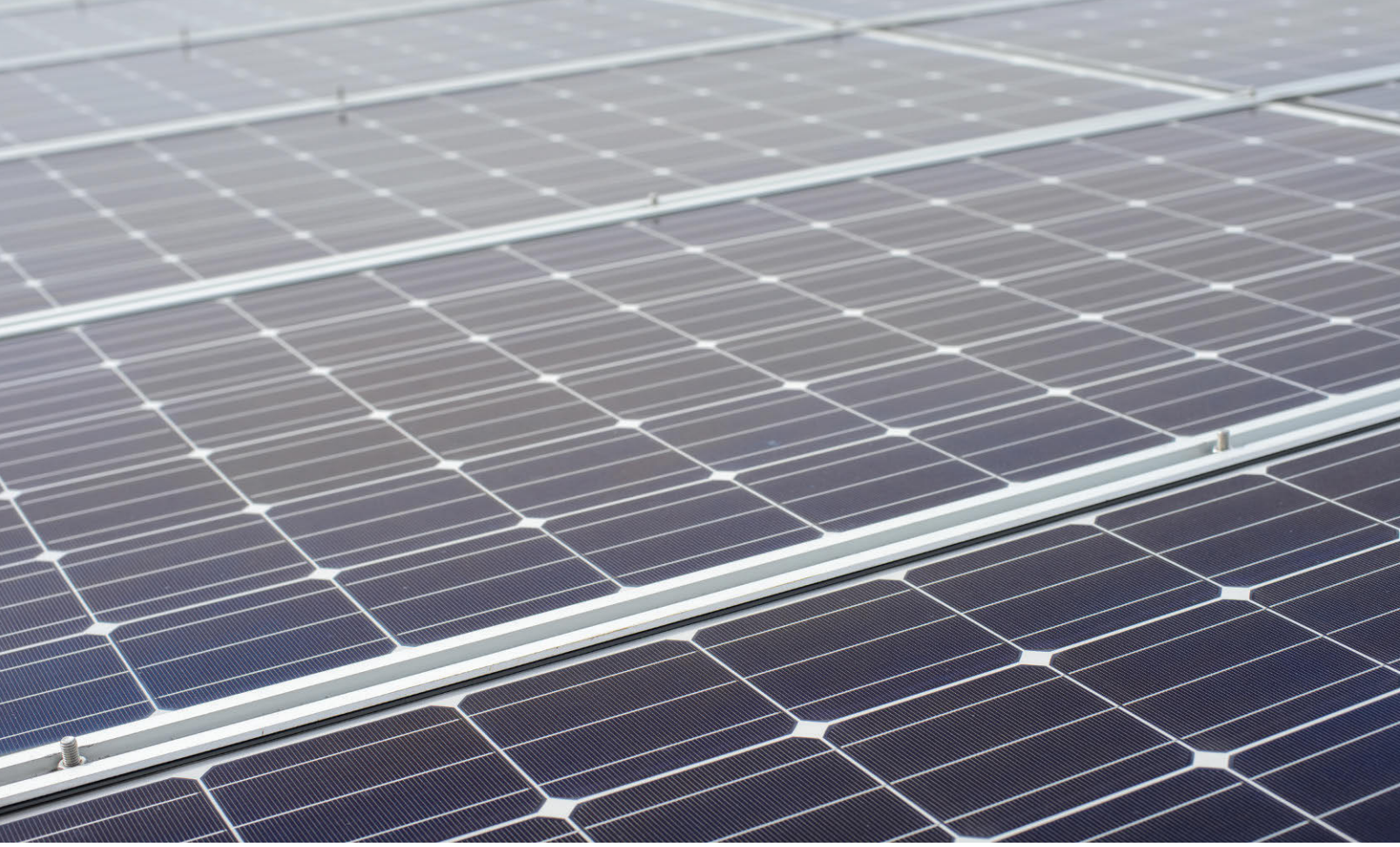


resources on the grid and recognizes storage as a resource, and Order 845 adjusts the definition of a generating facility to include electricity storage.

Additionally, several states have implemented policies supporting storage, including Maryland, which is the first state to provide tax credits for storage deployments, and Massachusetts, which has mandated the installation of 200 MWh of storage by 2020.

"Once market and regulatory frameworks are optimized for the inclusion of storage and various stakeholders are able to leverage the technology for their respective needs, the market will be primed for further accelerated growth," says Fox.

Wood Mackenzie forecasts that annual U.S. energy storage deployments will reach 4.4 gigawatts by 2024

A BRIGHT FUTURE

Lithium-ion batteries rule the energy storage market right now. "It looks like it will be the dominant technology for the next several years," Fox says.

Two factors will support that dominance. Prices will continue to fall as economies of scale keep improving and manufacturers continue refining the technology.

"Presently, what we are seeing are advances in the levels of sophistication and capabilities for different storage technology, such as power density and duration of lithium-ion batteries," says Fox. "For the next few years, we will see the optimization and improvement of existing technology rather than brand new technology."

But Voll says, "Solid-state batteries are the future."

Solid-state batteries can achieve higher energy densities because they can tolerate higher temperatures. They are also expected to allow for faster recharging and have a longer cycle life.

Additionally, because the liquid electrolytes in most lithium-ion batteries can allow dendrites to form, which can lead to shorts and thermal runaway, solid-state batteries are considered safer. As a result, they need less cooling and require fewer safety systems, so more compact battery designs are possible.

"There are different opinions on how long it will take to get to scale with solid-state batteries," says Voll. "Panasonic, which is behind the Tesla battery, tends to be very conservative, and they say we are 20 years away. I tend to think it is closer to five to seven years before they roll out."

Both Fox and Voll say the future looks bright for engineering firms serving the battery storage market.

"It is a rapidly evolving sector," says Voll. "Clients need help navigating the policies, technical challenges and commercial opportunities."

"Many clients in the markets we serve are looking to leverage storage," adds Fox. "They are looking to understand how best to use it, and we have the expertise to help answer those questions." ■

***Gerry Donohue** is ACEC's senior communications writer. He can be reached at gdonohue@acec.org.*

House Boosts Transportation Accounts in Annual Spending Bill

The appropriations bill for the U.S. Department of Transportation (DOT) approved by the House of Representatives in June would increase investment levels for most federal transportation infrastructure programs for the coming fiscal year.

The bill meets the Fixing America's Surface Transportation Act (FAST) funding levels for highway programs at $46.4 billion from the Highway Trust Fund and adds an additional $1.5 billion from the General Fund for surface transportation block grants, railway-highway crossing safety improvement and charging infrastructure along alternative fuel corridors.

A total of $13.5 billion is directed to Federal Transit Administration programs, fully funding FAST Act commitments and providing $2.3 billion for Capital Investment Grants, equal to the authorized level, and $750 million for transit infrastructure grants.

Rail programs are funded at $3 billion, including $350 million for Consolidated Rail Infrastructure and Safety Improvements—$95 million above the 2019 enacted level—$350 million for Federal-State Partnership for State of Good Repair, and $2 billion for Amtrak, including $700 million for the Northeast Corridor.

In response to recent administration actions to withdraw nearly $1 billion in federal grants to the California High Speed Rail project, the bill includes a provision preventing the DOT from canceling the other $2.5 billion grant agreement or demanding repayment of funds expended by California. It would also ensure that any de-obligated funds originally intended for the project could not be spent elsewhere pending the outcome of litigation, and that those funds could only be used for other high-speed rail projects.

For aviation programs, the bill maintains Airport Improvement Program spending from the Airport & Airways Trust Fund at $3.35 billion and adds $500 million in competitive airport grant funding from the General Fund. It also provides $3 billion for FAA Facilities & Equipment, consistent with current levels.

The Senate Appropriations Committee has been waiting to release its draft bills for FY 2020 pending negotiations with the White House on overall budget limits. Additional legislative action on the budget is expected later this summer.

Disaster Relief Package Provides Billions for Infrastructure Resiliency and Repair

On June 6, President Trump signed into law the Additional Supplemental Appropriations for Disaster Relief Act of 2019 (H.R. 2157), a $19.1 billion disaster relief package, more than half of which will fund infrastructure and related work in regions hit by hurricanes, floods and other natural disasters.

Infrastructure-related funding includes:

- $3.3 billion to the U.S. Army Corps of Engineers to repair and build flood and hurricane-protection projects.
- $2.7 billion to the Department of Defense to repair and reconstruct military bases hit by hurricanes in Florida and North Carolina and damaged by flooding in Nebraska.
- $1.6 billion to the Federal Highway Administration to reimburse states and territories for post-storm repairs.
- $2.7 billion to the Department of Housing and Urban Development for community development disaster relief block grants.
- $349 million to the Environmental Protection Agency to improve water system resiliency.

In addition, the legislation extends the National Flood Insurance Program to Sept. 30, 2019.

ACEC and Coalition Partners Urge Action on Infrastructure Legislation, Increase in Gas Tax

ACEC, along with a coalition of more than 40 national business and labor groups, sent a letter to President Trump and congressional leaders urging them to resume action on infrastructure legislation this year.

"Americans have suffered under the weight of our aging, failing infrastructure for far too long," the letter states.

The letter goes on to list the ways in which infrastructure legislation could boost productivity, make communities safer and ensure economic success.

"That is why business and labor groups have come together and proposed a funding solution: raising the federal gas tax," the letter says. "Democrats and Republicans in blue, red and purple states across the country have already taken this action, increasing their state gas taxes to finance their share of much-needed infrastructure improvement.

"Infrastructure, especially our nation's roads, bridges and transit systems, is a shared responsibility between the states and the federal government. States are doing their part. It is time elected leaders in Washington do the same."

ACEC Advocating Movement on Tax Extenders

The House and Senate are taking steps toward extending several expired tax provisions although final resolution remains unclear.

In May, the Senate Finance Committee established several task forces to examine the provisions commonly known as the tax extenders. ACEC submitted comments supporting a multiyear extension of the Section 179D energy-efficient commercial buildings tax deduction and the Section 45 production tax credit for renewable resources. These provisions were part of the legislative agenda during the ACEC Annual Convention and fly-in.

The House Ways and Means Committee acted in June, approving legislation that would reinstate the expired tax extenders for 2018 through 2020 and extend provisions expiring later this year. The bill would also expand the earned income tax credit for low-income working individuals.

In order to offset the cost of the legislation, the Ways and Means bill would accelerate a reduction in the estate tax exemption from the end of 2025 to the end of 2022. Final action on the tax extenders is not expected until later in the year and could be combined with budget legislation.

ISSUES ON THE MOVE	WHAT'S NEXT
Transportation Appropriations	Senate action expected in September
Tax Extenders	House floor action in September, Senate committee action in the fall

FHWA Finalizes Guidance on New 'Safe Harbor' Indirect Cost Rate Policy for New and Small Firms

The Federal Highway Administration (FHWA) is expanding and making permanent a "safe harbor" indirect cost rate policy for state departments of transportation.

The agency had conducted a three-year pilot study of a safe harbor rate in 10 states. Based on the positive results reported, the program will be made available to every state. The basic concept is to allow new, small and Disadvantaged Business Enterprise firms without a compliant Federal Acquisition Regulation (FAR) overhead rate to voluntarily use an artificially low rate while they develop a cost history and adequate accounting systems.

The policy is designed to enable more firms to compete for work and eventually transition to a FAR-compliant rate. It also allows DOTs to allocate limited audit resources to more complex, higher-risk contracts.

The FHWA notice is not a change in the underlying regulations; it is policy guidance issued to state DOTs. A safe harbor indirect cost rate policy would be one component of a DOT's risk-based oversight process. Agencies using the safe harbor indirect cost rate would be required to develop written policies establishing the program and oversight procedures designed to provide reasonable assurance of consultant compliance with the federal cost principles in accordance with 23 CFR 172.11(c).

While the pilot program set the safe harbor rate at 110 percent, the final guidance gives states discretion to set their own rate.

FHWA acknowledged and responded to the input that ACEC provided on the initial proposal. FHWA accepted the Council's recommendation that a safe harbor rate could be available for field-based contracts. The guidance also repeatedly makes clear that acceptance and use of a safe harbor rate is voluntary for firms, a point that ACEC strongly emphasized, and that agencies must also still comply with all federal, state and local laws and regulations on federally funded projects.

For More News

For legislative news, visit ACEC's *Last Word blog* at www.acec.org.

Sustainable Fiscal Solutions Highlight Infrastructure Importance

By Erin McLaughlin

UNDEFINED UNDEFINED / ISTOCK / GETTY IMAGES

Tackling long-term economic and fiscal sustainability in the United States is not a simple task. With the benefits and drawbacks of the Tax Cuts and Jobs Act of 2017 becoming evident and the problem of a $22 trillion and growing national deficit looming, economists and think tanks in Washington, D.C., are searching for ways to address these problems through policy action on infrastructure and the built environment.

As part of that search to address these challenges to the nation's economy, the nonpartisan Peter G. Peterson Foundation brought together seven leading policy organizations for the 2019 Fiscal Summit: Building America's Future held in June in Washington, D.C. The organizations represented a diverse political spectrum ranging from conservative (American Enterprise Institute, Manhattan Institute), moderate (American Action Forum, Bipartisan Policy Center, Progressive Policy Institute) and liberal (Economic Policy Institute, Center for American Progress). A report from the summit, "Solutions Initiative 2019: Charting a Sustainable Future," as well as discussions from the event, show consensus on economic and policy recommendations that may significantly impact infrastructure. These include:

Implementation of a federal carbon tax. Six of the seven institutions specifically call for a carbon tax, with five providing quantitative details (see chart: Think Tank Recommendations for a Federal Carbon Tax). As the Bipartisan Policy Center (BPC) notes, a carbon tax would "internalize the negative externalities associated with carbon and spur innovation in sustainable green or renewable energy technologies." Most of the other institutions calling for the tax also recommend dedicating prospective revenues to research and development around technologies to fight climate change, as well as initiatives toward clean energy infrastructure and resilient design and construction.

Raising the federal gasoline tax. A gas tax increase is proposed by several think tanks. The conservative American Enterprise Institute details a 15-cents-per-gallon increase in 2020 with future increases indexed to construction prices. The BPC also calls for a one-time increase of $0.334 per gallon, which would subsequently be indexed to inflation, but notes that raising the gasoline tax is not a sufficient long-term solution. "With rising fuel efficiency and electric vehicle ownership, gas tax increases cannot sustainably meet expected long-term infrastructure needs. New, innovative funding mechanisms are necessary to support these needs down the road," according to the BPC. The Progressive Policy Institute notes this same problem and calls for replacing fuel taxes with a vehicle-miles-traveled tax.

Budgeting ahead for disaster recovery spending. With the increase in disasters over the last decade, there is a call for a more institutionalized way of funding recovery packages. The BPC suggests using dedicated revenues from the proposed carbon tax to fund relief and recovery efforts. The Economic Policy Institute concurs—noting that current one-time disaster relief packages are not sensible as funds will "surely be needed as natural disasters become more common because of global climate change."

Think Tank Recommendations for a Federal Carbon Tax

Organization	Base Year/2020 Carbon Tax Proposal	Annual Increases to Carbon Tax After Base Year
American Action Forum	$20 per metric ton	Chained consumer price index for all urban consumers plus 5%
American Enterprise Institute	$25 per metric ton	Inflation plus 2%
Bipartisan Policy Center	$25 per ton	2% per year (inflation-adjusted)
Economic Policy Institute	$80 per ton	Rising to $120 per ton over time
Progressive Policy Institute	$30 per ton	Inflation plus 5%

SOURCE: PETER G. PETERSON FOUNDATION

'18-Hour Cities' Gain Commercial Real Estate Attention

For some time, real estate investors have touted the benefits and stability of developing projects in 24-hour cities, but the new buzzword in commercial real estate circles is "18-hour cities."

What are 18-hour cities? They are neither 24-hour cities, nor are they 9-to-5 cities that empty of life when the workday ends. Although there is not an official list, most experts agree that in the United States, the 24-hour cities are the real estate markets of Boston, Chicago, Los Angeles, New York, San Francisco and Washington, D.C. Other cities often considered 24-hour? Miami and Philadelphia.

The 18-hour city has many of the same attributes of a 24-hour city without the density or around-the-clock vibrancy. These include urban amenities, access to mass transit and walkable neighborhoods, along with suburban qualities such as good schools and green space. Additional qualities—and what is largely attracting residents, including older millennials—are a lower cost of living and doing business within diverse and growing economies.

As with 24-hour cities, no official list exists, but the top 18-hour cities seeing growth and success are featured on the map below. "Emerging Trends in Real Estate 2019," by PwC and the Urban Land Institute, notes that 17 of the top 20 growing real estate markets fall into this 18-hour category. "The projected average annual population growth over the next five years in the 17 markets is 1.3 percent compared with 0.7 percent for the United States as a whole," according to the report.

Because these 18-hour cities have become increasingly diversified economically—compared to established 24-hour cities that remain space-constrained and prohibitively expensive for many developers—their attractiveness to commercial and residential real estate developers is expected to continue.

Commercial & Residential Real Estate

Health Care & Science+Technology

Intermodal & Logistics

Economic Outlook

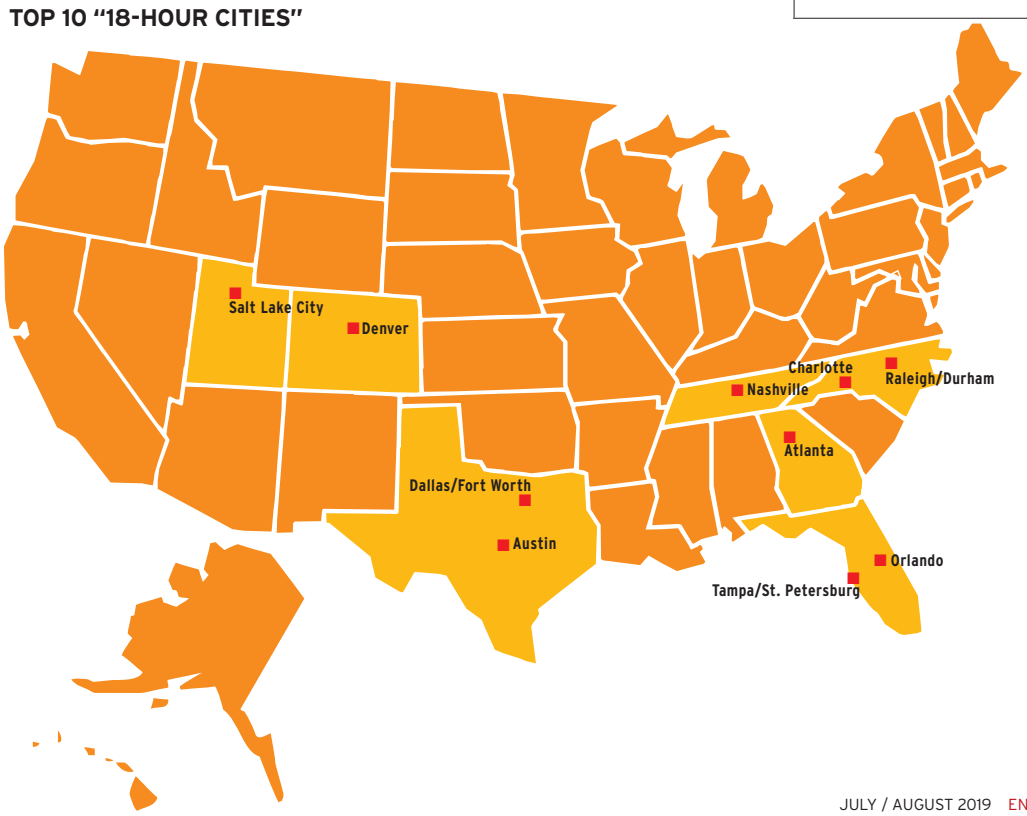
Energy & Utilities

Public-Private Partnerships (P3s)

The Private Side is a regular department of *Engineering Inc.*, focusing on the private-sector markets listed above, and information and insights on public-private partnerships and economic data relevant to the industry. For more on these topics, subscribe to ACEC's bimonthly *Private Industry Briefs*: **https://programs.acec.org/industrybrief/**.

Erin McLaughlin *is ACEC's senior director of private market resources. She can be reached at* ***emclaughlin@acec.org****.*

TOP 10 "18-HOUR CITIES"



From a Global Perspective

The engagement of engineers in fulfilling agency international goals

GARY LANDSMAN

Mark Green was sworn in as the 18th administrator for the U.S. Agency for International Development (USAID) in August 2017. Before joining USAID, he served as president of the International Republican Institute, a nonpartisan, nonprofit organization dedicated to advancing democracy and human liberty around the world. Green is also a former ambassador to Tanzania and a four-term former congressman from Wisconsin.

In this exclusive interview with ACEC's *Engineering Inc.*, Green shares his vision for the international development agency, his goal to increase USAID collaboration with the private sector and how that will open new markets for engineers.

ACEC: Your mantra in office has been "the purpose of foreign aid is to end the need for its existence." How has your experience prior to your leadership at USAID—including in the House of Representatives as well as U.S. ambassador to Tanzania and board member on the Millennium Challenge Corp.—shaped your views on development and how USAID contributes to achieving America's global development objectives?

USAID Administrator Mark Green: On Sept. 11, 2001, while serving the good people of northeast Wisconsin in Congress, I painfully learned just how small the world had become. After 9/11, I was part of the team that crafted key development initiatives such as the President's Emergency Plan for AIDS Relief and the Millennium Challenge Corp. (MCC), programs that have transformed U.S. development assistance and brought about remarkable changes in many parts of the world. Later, while serving President Bush and the American people as ambassador to Tanzania, I saw firsthand how those same tools actually worked in the field and what we could do to make them even better.

My work with the Consensus for Development Reform and the International Republican Institute and my time on the board of the MCC drove home the importance of monitoring, evaluation and focusing on measurable outcomes.

My more than 30 years of development experience—from working in classrooms in Kenya, to walking hospital wards in Tanzania, to observing polling places in Jordan and Burma—have shown me that the American people and our lead development agency, USAID, can be an irreplaceable force for good in the world.

But no matter where I went, no matter what I saw, I was always struck by the strength of human dignity and the innate desire of every human being, every family and every community to want to provide for themselves and to build a brighter future.

What our approach is all about is trying to help our partners get there. Everything that we do is fostering this notion of self-reliance. I believe in what we do. I wish it were not necessary. I think we all feel that way. The purpose of foreign assistance is to end the need for its existence. Now, I suspect we will have a lot to do for quite some time to come, but we will always be pushing in that direction.

ACEC: USAID recently unveiled a new private sector engagement policy. Can you talk about the goals of this initiative, and how can U.S. engineering firms that currently support USAID missions, as well as firms interested in entering this market, engage with and support the effort?

Green: Last December, I launched USAID's first-ever private sector engagement policy. Its premise is that private enterprise is the single most powerful force for lifting lives, strengthening communities and accelerating self-reliance. The policy is an agencywide call to action to work hand in hand with the private sector to design and deliver our development and humanitarian programs across all sectors, and to harness our resources to open markets and other opportunities for U.S. businesses.

Through the policy, we are committing to assessing and pursuing market-based approaches to achieve more sustainable development and humanitarian outcomes. This new approach is a significant step in reforming how we conceive, design and deliver our development investments and humanitarian assistance—that is, how we build the USAID of tomorrow.

"USAID is excited about the possibilities that increasing our collaboration with the private sector can bring to our work across all areas, including collaboration with U.S. engineering firms in our programs."

Working with the private sector and the market-based approaches it leverages builds the requisite skills, resources, knowledge, local institutions and incentives that enable country systems and markets to be self-sustaining. One of our commitments is to invest more through U.S. small businesses, both in Washington, D.C., and our overseas missions. We are always interested in attracting new partners, including small engineering and design companies across the country.

USAID is excited about the possibilities that increasing our collaboration with the private sector can bring to our work across all areas, including

Administrator Mark Green (center) discusses the location of ongoing USAID projects with ACEC President/CEO Linda Bauer Darr (left) and former ACEC Chair Manish Kothari.

GARY LANDSMAN

collaboration with U.S. engineering firms in our programs. We are particularly committed to working with U.S. small businesses as evidenced by our steadily increasing utilization of small business, as well as by USAID's emphasis on broadening our partner base. We are confident that our approach will help us serve even better both our beneficiaries and the U.S. taxpayers who make it all possible. We strongly encourage U.S. small engineering firms, and others interested in collaborating with us, to track the USAID Business Forecast for upcoming partnership opportunities, including set-asides for small businesses.

ACEC: With the passage of the BUILD Act paving the way for a new U.S. International Development Finance Corp., bringing the Overseas Private Investment Corp. together with USAID's Development Credit Authority Program, how do you see USAID's mission changing or improving with these enhanced tools coming online?

Green: Through the new Development Finance Corp. (DFC), USAID will have access to more financing tools and a deeper bench of finance expertise than was available under the Development Credit Authority (DCA) program. With a broader toolkit and new authorities, we will be able to engage private sector enterprises more easily and efficiently and be a more flexible and nimble partner in co-designing projects that serve both development and commercial objectives.

To make sure our missions take advantage of these tools and expertise, we need to create very strong institutional linkages between USAID and the DFC. Our DCA team has been working very hard with our colleagues from the Overseas Private Investment Corp. to develop these linkages and have them in place before the DFC comes into being on Oct. 1, 2019.

ACEC: Infrastructure is foundational to the success of USAID's humanitarian, social and economic missions in the developing world—clean drinking water, road networks to connect communities, sustainable energy, as well as other essentials such as schools and hospitals. Where do you see the greatest needs in terms of how the built environment intersects with the agency's key missions? And how can USAID enhance and leverage its infrastructure spending through increased engagement with U.S. engineering and construction firms?

Green: Throughout USAID's history, our partnerships with U.S. engineering firms have allowed us to plan, design and build infrastructure critical to recovering from disasters and promoting long-term development, while simultaneously building the capacity of host country governments and the local engineering and construction firms to maintain infrastructure services and expand upon USAID's direct investments. USAID continues to see a large need for investment in the health, education and water sectors, where advances in sustainable local infrastructure remain essential to promoting self-reliance.

As USAID works with partner governments, the donor community and private investors to address the global

infrastructure gap, we anticipate that U.S. engineering and construction firms will play an increasingly important role in the planning and preparation of infrastructure investment opportunities that will leverage commercial financing to further sectoral development goals and advance self-reliance. As the world becomes increasingly urbanized, we will also rely on U.S. engineering firms to help us navigate the complexity of the design and construction of urban infrastructure systems.

ALEX DEHELEAN, USAID

Administrator Mark Green is welcomed by community leaders in rural Cote d'Ivoire while visiting a woman-owned savings and loan association.

ACEC: A key initiative of this administration's foreign policy in Asia has been the Free and Open Indo-Pacific Strategy, which President Trump laid out during his trip to Vietnam in 2017 and Vice President Pence elaborated on during his visit to Asia in November 2018. How does USAID fit within this strategic framework, and how is it contributing to achieving the strategy's objectives?

Green: In Asia, USAID plays a key role in advancing the U.S. government's Indo-Pacific Strategy (IPS). America's vision for a free and open Indo-Pacific region is one in which all nations are sovereign, strong and prosperous. Together with our U.S. government partners, and in coordination with like-minded donor partners including Australia, Japan and the Republic of Korea, USAID helps advance the IPS by strengthening governance in areas critical to achieving this vision—primarily in economic freedom, democratic citizen-responsive governance and the sustainable management of natural resources. By promoting open, transparent and rules-based governance across Asia, the IPS mitigates the influence of predatory players while unlocking an enterprise-driven future. Private capital, entrepreneurship, open markets and the rule of law are the forces that will improve lives, strengthen communities and accelerate self-reliance.

Our work in economic freedom helps to improve market competitiveness and level the playing field for legitimate players. We play a leading role in U.S. government initiatives that address Asia's substantial infrastructure gap, with a focus on making legal and regulatory frameworks conducive to private sector investment. These initiatives announced by Secretary of State Pompeo and other Cabinet officials at the Indo-Pacific Business Forum in July 2018 include the Infrastructure Transaction and Assistance Network, which enhances U.S. government efforts to advance sustainable infrastructure in the Indo-Pacific, and the Digital Connectivity and Cybersecurity Partnership, which improves free digital connectivity and expands opportunities for U.S. technology exports.

> "USAID continues to see a large need for investment in the health, education and water sectors, where advances in sustainable local infrastructure remain essential to promoting self-reliance."

Infrastructure development, which is key to economic growth in the Indo-Pacific, can have negative impacts on natural resources, which are critical for sustained economic growth. At the same time, irresponsible extraction of natural resources threatens food security, environmental and public health, inclusive economic growth and stability. USAID works with governments and civil society to strengthen their governance of natural resources, including vital energy sources. We promote transparent government policies, regulations and transactions that foster adherence to internationally accepted standards, including environmental safeguards, and mitigate the entry of malign authoritarian players. USAID plays a leading role in Asia EDGE (Enhancing Development and Growth through Energy), an interagency initiative also launched in July 2018 that is working to strengthen energy security and expand access to energy across the Indo-Pacific region and Central Asia.

With regard to citizen-responsive democratic governance, USAID plays a leading role in the Indo-Pacific Transparency Initiative, announced by Vice President Pence in November 2018 during the APEC CEO Summit. The interagency initiative promotes sound, just and responsive governance through efforts to counter corruption while encouraging strong oversight by civil society, responsible borrowing, honest practices in public procurement and contracting, and judicial sector and legal reform, among other aims essential to rule of law. ■

BY STACY COLLETT

NAVIGATING A AMID SIMILAR

New technology has the engineering industry at an inflection

The engineering profession continues to ride the wave of a robust economy, an abundance of projects in the pipeline and positive employment numbers.

"This has been a really significant time in our industry in that the public and private sectors are both booming at the same time," says 2019-2020 Executive Committee Chair-elect **Charles Gozdziewski**, chairman emeritus of Hardesty & Hanover. "I do not know if that has happened to this degree in the last 30 to 40 years."

At the same time, the industry finds itself at an inflection point that will have a profound impact on the profession. As technologies such as automation, machine learning and augmented reality permeate all sectors, private companies are taking over some state and local infrastructure projects. Furthermore, some of the fastest growing companies like ride-sharing service Uber do not have tangible assets. As a result, the traditional economic drivers are changing.

Charles Gozdziewski

How should engineering firms prepare for the future? And what leadership skills will be required to take today's firms to the next level of success?

Members of the 2019-2020 ACEC Executive Committee offer their views on how opportunities for the engineering industry far outweigh the challenges as well as the prospects that will drive the industry into the future.

BIG DATA, ANALYTICS AND AI

Since ExCom Senior Vice Chair **Jerry "Jay" Wolverton Jr.** began his career 35 years ago, the amount of data available at engineers' fingertips has completely changed the work environment. And that data will help transform future projects, he says.

Jerry "Jay" Wolverton Jr.

"Cities around the world are investing in connected infrastructure, and it is going to help us better manage urban assets, such as wastewater treatment plants, roads and public transit by monitoring things as they are being built and used, optimizing facilities and moving people about in the right ways," says Wolverton, president and CEO of Wolverton & Associates.

Vice Chair **W. Arthur Barrett** sees exciting opportunities to improve transportation services and road maintenance

DONG WEN JIE/GETTY IMAGES

NEW FUTURE CHALLENGES

point as the way business is conducted continuously evolves

through the use of big data, analytics and artificial intelligence along with traffic forecasting equipment, crowdsourcing apps, such as Waze, and other city management technologies.

"We can use big data not just for planning purposes, but for spur-of-the-moment and operational changes to our public transit services," says Barrett, senior vice president of Gannett Fleming.

Barrett believes the industry will also rely on these technologies to monitor road conditions as autonomous vehicles merge onto highway systems and repairs to signals and systems have to be made quickly to avoid accidents.

W. Arthur Barrett

On the analytics side, Barrett's firm is preparing for its future with a new "Geo Decisions" group, which expands its geospatial mapping practice to examine trends for sustainability and for moving people. The group studies where clients put new facilities, how facilities are maintained, their life expectancy and how the environment will change as a result of the facility.

AUTOMATION IN DESIGN AND CONSTRUCTION

Positioning firms for the future also includes automation—and how it can serve both firms and their clients.

"Automation has already taken over many repetitive jobs that are based on mass performance, and lot of people are scared about that," says Vice Chair **Kenneth Smith**, president and CEO of T. Baker Smith. "From an engineering profession standpoint, it is a great opportunity for engineers to provide those automated solutions to clients. As engineers, we are supposed to be the trusted adviser bringing innovative solutions to the table, not just designs. I see for the profession that it is raising the bar for us."

Kenneth Smith (left)

To prepare for the future, T. Baker Smith has established a 10-person innovative solutions group made up of programmers, electricians and GIS specialists who focus exclusively on bringing innovative solutions to their clients.

In the design and construction fields, Vice Chair **Keith London** is excited about trends in 3D, 4D, 5D and even 7D design, which have the potential to add long-term asset management planning into building design.

Keith London

"As our industry gets better at automation to help manage and operate our clients' assets over the next five to 10 years, you will see more and more of it," says London, who is president and CEO at Kennedy Jenks Consultants.

NEW TYPES OF CLIENTS AND FUNDING

It is not just the evolution and adoption of automation that firms are seeing more often—it is also opportunities to serve new clients and find new ways to fund projects.

HNTB has worked solely in the government transportation market for most of its 114 years. Now, the firm is working with companies such as Amazon and Apple—adding to a growing list of private industry customers.

"They come in and they are looking at moving 1,000 people to a community. They are designing their own infrastructure for their own campuses," says Vice Chair **Keith Jackson**, senior vice president of HNTB. "Or they are working with transit agencies to get transit to their facility—but they are building the infrastructure themselves. They are putting in a line and a station, and they will be giving that to the transit agency when they are done with it. That has been done on local roads forever, but bigger infrastructure, that is different."

Keith Jackson

The new partnerships with the private market also come with a new outlook on billing structures.

"The private market is less interested in what our design cost is because they do recognize we are an important but small piece of the overall project," Jackson says. "They are less concerned over our fee structure than they are over knowing that the date is certain that a project is completed."

Some ExCom members maintain that the industry has mixed reviews right now from firms that do large-scale publicly funded projects. Highways, bridges, tunnels and airport projects are not flowing at comparable levels to privately funded projects due to funding issues, but some ExCom members see change on the horizon.

"I believe there is the political will to finally invest in the infrastructure of the country," says Vice Chair **John Carrato**, president and CEO at Alfred Benesch & Co. "It sounds now like both parties are on board, so I am very hopeful that we will have some kind of capital plan for infrastructure investment in late 2019 or 2020."

John Carrato

While government funding typically falls short of what is needed, ExCom Treasurer **Stephanie Hachem** says cities and states are stepping up in the name of economic development.

"We are going to find success in the understanding and acknowledgement that infrastructure projects have a big impact on our ability to attract and sustain business, and we are seeing a shift in understanding," says Hachem, senior vice president at Kimley-Horn and Associates.

LEARNING OPPORTUNITIES

The rapidly changing engineering profession has fueled an entrepreneurial spirit in many engineering firms, according to NAECE President **Michael Smith**.

Stephanie Hachem

"New processes, new techniques, new teaming arrangements—that is exciting for engineering firm leaders," says Smith, executive director of ACEC/Utah. "The changing needs of the economy and their clients continue to drive the engineering industry to be creative."

Creativity will be required if traditionally public-serving firms want to cross the chasm to more plentiful and, perhaps, more lucrative private industry projects. The U.S. spends about a trillion dollars per year on construction projects. Federally funded projects account for $200 billion of the total, leaving $800 billion spent on industrial, institutional, academic and commercial projects, which are by and large private sector-funded, according to ExCom Chair **Mitchel Simpler**. He believes that both private- and public-serving firms have the opportunity to learn from each other and participate in different types of projects.

Michael Smith

"We have the ability for two related but different market sectors to learn from each other," says Simpler, managing partner of Jaros, Baum & Bolles. "The things we do in the private sector, which are in many cases a different way of approaching how

we get projects and contract for projects, is a way to inspire both sides so that we as an ACEC group can all benefit."

NEW LEADERSHIP SKILLS

Navigating the seismic shift in the engineering profession requires an important set of leadership skills if firms are to continue riding the wave of change. In today's environment, leaders must adapt to rapidly changing conditions, according to Barrett.

"Everything is changing—the way we interact with our staff, the generational differences with employees and clients and

Mitchel Simpler

evolving technologies," says Barrett. "A leader today has to be able to see what is coming down the road and position their firm to capitalize on these things."

"Today's engineering firm leaders need more than technical engineering expertise; they need a wider breadth of knowledge to successfully run their engineering business," Michael Smith says. "It is having a breadth of knowledge (beyond engineering): about political matters and things that affect their clients, firm items regarding risk, legal and HR issues. That is very different than it was decades ago. The value of an engineering consultant is that innovative thought process and the expertise and knowledge that they bring to the table, not just the plan-sets."

MENTORING AND EMPOWERING EMPLOYEES

Despite abundant times for the industry, firms still struggle with a long-time threat—recruiting and retaining top engineering talent. To be successful, it takes commitment from top leadership, according to Carrato.

"It is a very tough market right now. I believe you have to have a vision for your firm and share that vision through effective communication," says Carrato. "It is also essential, no matter how busy you are, to continue to invest in the professional development of your employees. It is leading by example, but also empowering your own employees. As a leader, you need to make sure that does not slip because you are too busy."

Engineering firm leaders also need to reinforce the purpose of the company and its clients.

"I believe that our people function, operate and thrive when their purposes are being achieved," London says. "Employees join an organization because they believe that a company's purpose fits with theirs. We have to continue reminding our employees about how all our purposes should align. As an industry, we are firms full of great purpose. People talk a lot about compensation, but I am a big believer that as long as they feel like they are being compensated fairly, then purpose will drive all other decisions about retention."

VISION FOR THE FUTURE

Engineering firm leaders also need to have a wide scope of vision, says Kenneth Smith. "You have got to be able to look out into the future," he says. According to Smith, fewer younger engineers are interested in the traditional ownership stake in the firm.

"Less folks are really interested in that model, so you have to look into the future and have a vision," he adds. "I am not even sure that calling ourselves an engineering firm is even what we need to do in the future. It is more of an innovative systems approach. Clients want us to bring new and better innovative systems to the table."

ACEC President and CEO Linda Bauer Darr says, "It is abundantly clear that new technologies are prompting an evolution in the way our Member Firms operate and apply best practices. It is gratifying to realize that the passion and expertise possessed by the new ExCom helps position the Council to effectively serve our members' interests during these fluctuating times."

RELATIONSHIP BUILDERS

Firm leaders must be relationship builders—both internally and externally, according to Wolverton.

"Internally, it is about culture. You want to have a good environment, challenging projects and people who have a sense of autonomy," says Wolverton. "Externally, engineers are really an extension of the staff of our clients. We serve as development managers or liaisons to government officials, or we advise on financing. Those clients want to work with that engineer who is willing to step up and take on so much more."

Linda Bauer Darr

Simpler believes that part of relationship-building is being a good listener. "You need to hear what people are telling you," he says. "You need feedback upward and downward, communication where staff and clients are both telling you the facts and what is happening so that you are able to make informed decisions. Leaders should also have empathy and not be a dictator or a narcissist."

Firm leaders need to be very savvy with the contract terms that they agree to in order to protect themselves from a liability standpoint, according to Hachem.

"Especially when we accept terms in a contract that have broad-form indemnification and duty to defend," says Hachem. "They must ensure they have tight reins on what is expected of them and what they are going to do under the contract, and that the contract has fair terms and conditions should something go awry."

CAUTION AHEAD

While the engineering industry for the most part has felt confidence and security with the economy, some are now asking, can this go on forever? Savvy firm leaders should prepare for any type of change in the economy, whether slight or dramatic.

"In the event that the economic bubble does burst, it would be wise to make sure there are some cash reserves, and some planning should be done prior to expectations going forward," Gozdziewski says. "It is very tough to implement business decisions during chaos, so you should have some steps in place prior to any downturn events." ■

***Stacy Collett** is a business and technology writer based in Chicago.*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BY CALVIN HENNICK

New Protection Against CYBER ATTACKS

Engineering firms must also adopt an effective risk management strategy to ensure against loss if an attack gets through

One engineering firm received what appeared to be an invoice from a subconsultant, along with instructions to forward payment to a new bank account. The firm's accountants paid the invoice—or, at least, they thought they had paid it, until they heard back weeks later from officials at the other company, who said they never received the money.

At another firm, an employee opened an email he thought was from his bank, instructing him to update his direct deposit information. But a couple of weeks later, he discovered that his next check never made its way into his account.

Both firms are clients of Mike Herlihy, executive vice president and partner at specialty insurance broker Ames & Gough, and an ACEC Risk Management Committee member. Unfortunately, both were victims of phishing attacks by cybercriminals.

"It appeared that the emails were coming from people they normally do business with, so they did not think anything about it," says Herlihy. "With that type of scam, the victim sends over the money, and then the criminals clean out the account and shut it down. You cannot trace them."

Fortunately for the firms, both had cybersecurity insurance policies to cover their losses; however, a mix of cybersecurity tools, policies and employee training could have prevented both incidents.

There is a growing awareness among engineering firms that a multipronged strategy is needed to protect companies from potentially disastrous cyberattacks—including both an aggressive cybersecurity posture to prevent hackers from penetrating networks and risk management measures that will limit the damage of successful attacks.

"It is not a matter of 'if,'" says Terry C. Nelson, vice president of risk management for Foth, and vice chair of the ACEC Risk Management Committee. "It is 'when.' You are going to have a problem, and you had better have a response to that problem figured out. Otherwise, once it hits you, the repercussions are going to be serious."

DANIEL BAJAR

THE THREATS FACING FIRMS

People are just realizing the danger posed by cybercriminals, according to Nelson. "In the last year to two years, people are really waking up to the fact that they are at risk," he says. "We look at the data from the attempts on our servers, and there are an awful lot of attempts on a daily basis. I believe it is happening to everybody in the industry."

Cyberattacks can be especially devastating for small and mid-sized businesses, which may lack the resources to bounce back after a large financial or data loss. "Most engineering firms are small or midmarket firms," Nelson says. "So that really hits home."

One of the most pressing cyber dangers facing engineering firms is ransomware—malicious software that locks down access to corporate data until a company pays a "ransom" to the hackers.

"We work on extremely large proposals, and their cost of preparation can be in the hundreds of thousands of dollars. A ransomware attack that locked down the proposal documents immediately before submission would present a significant risk," says John Buchheit, senior vice president and corporate risk officer at Gannett Fleming, and chair of ACEC's Risk Management Committee. "If we had a proposal due today at 4 p.m., and hackers locked down the proposal with ransomware, there would be more at stake in not meeting that deadline than in paying the ransom."

According to Buchheit, Gannett Fleming has experienced one minor ransomware incident that seized control of a single workstation, but files were restored from a backup server.

Social engineering attacks such as phishing or spear phishing are also prevalent—and potentially costly. "Phishing" occurs when an attacker attempts to trick targets into entering credentials such as usernames and passwords via a phony link; "spear phishing" attacks are similar but use personalization—such as the spoofing of a boss's or colleague's email address—to fool victims.

Nelson says that an employee at his firm was nearly tricked by an email that appeared to be from a manager, instructing the employee to purchase gift cards for a fundraiser and then share the codes on the cards. The scam was only caught because the company requires multiple people to sign off on such expenditures.

"We have even had attempts where attackers have mimicked the writing style of our CEO," Nelson says. "The level of sophistication of the phishing attacks is really mind-blowing."

According to the National Cybersecurity Alliance, **60 percent** of small and mid-sized companies will go out of business within six months of a successful hack

PUTTING SECURITY MEASURES IN PLACE

The phishing attacks that swindled Herlihy's clients out of thousands of dollars could have been prevented through technologies and procedures designed to boost cybersecurity.

Engineering firms must put in place cybersecurity tools such as firewalls, endpoint security solutions, and identity and access management tools. But processes are also important. For instance, a policy requiring callback verification for any changes to payment information can prevent firms from disbursing funds to fraudsters. And a policy requiring employees to change their passwords at set intervals can limit the amount of time that hackers are able to leverage stolen credentials.

"Cybersecurity plans need to be quite comprehensive," says Andrew Mendelson, chief risk management officer of the professional liability insurance company Berkley Design Professional, and an ACEC Risk Management Committee member. "The goal is to protect the confidentiality, integrity and availability of data and information. In order to do that, you have to address the people, policies, procedures and technology."

Mendelson calls password hygiene the "low-hanging fruit" of cybersecurity and says that firms should not only require employees to regularly change their passwords but should also implement stringent requirements for password complexity.

For example, firms should require a certain number and mix of letters, numbers and symbols. According to Mendelson, firms should also regularly (not less than daily) back up their data to limit the potential damage of a ransomware attack or other cyberattack.

"We look at the data from the attempts on our servers, and there are an awful lot of attempts on a daily basis. I believe it is happening to everybody in the industry."

TERRY C. NELSON
VICE PRESIDENT OF RISK MANAGEMENT FOTH
VICE CHAIR, ACEC RISK MANAGEMENT COMMITTEE

CYBERSECURITY: BY THE NUMBERS

1.95 billion
The total number of records containing personal and other sensitive data that were compromised between Jan. 1, 2017, and March 20, 2018.

191
The average number of days it takes for organizations to identify a data breach.

77 percent
The portion of IT professionals who say their organizations lack a formal cybersecurity incident response plan.

76 percent
The portion of organizations that say they would likely increase cybersecurity spending following a breach that causes significant damage.

64 percent
The portion of organizations who say they would *not* increase their cybersecurity budgets after an attack that does not cause harm.

75 percent
The portion of data breaches caused by external attackers.

25 percent
The portion of breaches caused by careless, negligent or malicious insiders with legitimate access to systems and data.

71 percent
The portion of U.S. enterprises that report suffering at least one data breach over the past few years.

56 percent
The portion of IT decision-makers who identify phishing attacks as their biggest current cybersecurity threat.

SOURCE: TECHBEACON

THE IMPORTANCE OF STAFF TRAINING

Because hackers rely so heavily on phishing and spear phishing to steal credentials and penetrate networks, it is essential that staffers be trained to distinguish legitimate emails from fraudulent ones—a skill that has grown more difficult as hackers have become more sophisticated. Whereas phishing emails were once littered with spelling errors and grammatical mistakes, they now sometimes contain official corporate logos and utilize detailed knowledge of organizational charts.

Effective training sessions will also cover other, often overlooked, aspects of cybersecurity. For example, hackers will sometimes set up unsecured Wi-Fi connections in public spaces like airports, and then use those connections to steal credentials and data from unsuspecting employees. Without cybersecurity training, some staffers may not know that such an attack is possible.

"It all starts with education," Nelson says. "That is one of the things we have really beefed up as an organization. We have cybersecurity as a module in our onboarding for our new employees, and we conduct training on an ongoing basis throughout the year. Everybody is exposed to all the tricks of the trade and the things they might be asked to do. It has proven to be one of the most effective tools we could put in place."

Nelson's firm conducts its own training sessions, but he notes that smaller firms can bring in outside consultants to educate staffers.

Herlihy says his company works with a consultant to put employees through cybersecurity training. The consultant even sends out (harmless) phishing emails to staffers to see whether they click on bogus links. "We were taught to hover over the sender's email address to see whether there might be something slightly different from the real email address," Herlihy says. "That training is critical."

"Nearly all businesses are at least asking to get quotes for cybersecurity insurance."

MIKE HERLIHY
EXECUTIVE VICE PRESIDENT AND PARTNER
AMES & GOUGH
MEMBER, ACEC RISK MANAGEMENT COMMITTEE

Buchheit says there is one central message to the anti-phishing training that staffers at his firm receive. "Whatever you do, do not click on the attachment," he says. "Instead, we tell people to forward the message to IT. They have the ability to figure out where it originated. They can extract metadata, then use that information to inform our filters and block future attempts."

COVERING AGAINST LOSSES

Only a few years ago, cybersecurity insurance policies were nearly unheard of. Some liability policies covered firms if they accidentally shared infected files with their clients, but stand-alone cybersecurity policies that cover a firm's own losses are relatively new.

Still, Herlihy estimates that 60 to 70 percent of his clients are opting for cybersecurity coverage. "Nearly all businesses are at least asking to get quotes for cybersecurity insurance," he says. "Certainly, when a company is up for renewal, we are advising them that they should be carrying it. Another factor driving the decision for engineering firms to purchase cybersecurity insurance is that some clients are insisting in their contracts that firms have standalone cyber insurance policies."

Nelson says his firm began carrying cybersecurity insurance three to four years ago. He recommends that firms not only buy coverage but also carefully evaluate different providers and their ability to help a company respond to a cyberattack.

"If you just buy a cyber policy, you can report back to your board that you have it, but there is a lot of due diligence you need to do to make sure the policy is meaningful," he says. "You are hiring a partner—more so than almost any other insurance—by way of someone who has a dedicated team that can respond to an event immediately, help you sort out how it happened, and remedy your system to get you back up and operating."

According to Herlihy, that type of partnership can help firms not only to respond to attacks but also to prevent them.

"Even if you do not have a claim for a loss, there is a lot of useful information [during the approval process] that helps people figure out how to design a program to protect themselves," he says. "You are getting a lot of upfront help, in hopes that you never have a claim. It is definitely money well spent." ■

A 13-POINT RISK MANAGEMENT CHECKLIST

When firms attempt to obtain cybersecurity insurance, they will likely be asked if they have put the following precautions in place:

1. Up-to-date, active firewall technology
2. Patch management
3. Multifactor login for privileged access
4. Remote access limited to VPN
5. Incident response plan
6. Media and website content controls
7. Require service providers to demonstrate adequate network security
8. Updated anti-virus software active on all computers and networks
9. Intrusion detection software
10. Data backup procedures
11. Procedure to test or audit network security controls
12. Disaster recovery plan or business continuity plan
13. A person or department responsible for information security

***Calvin Hennick** is a business, technology and travel writer based in Milton, Massachusetts.*

XUJIAN / GETTY IMAGES

2019 PLI Survey of ACEC Member Firms:

Still a Buyer's Market

BY MAUREEN CONLEY

MEMBER FIRMS REPORT INCREASED REVENUE; CLAIMS ALSO ON THE RISE

Continuing the trend revealed in past professional liability insurance (PLI) surveys, ACEC's 2019 PLI survey of Member Firms finds the market remains in favor of the buyer despite continued and emerging risks concurrent with the increase in revenue reported by Member Firms.

Business for design engineers is very robust, according to Jim Messmore, senior vice president at Hanson Professional Services, Inc., and former chair of the ACEC Risk Management Committee. "This year, basically all the disciplines are reporting very strong growth," he says. With the exception of a brief decline in 2016, Messmore says the majority of firms have reported revenue increases every year since 2010. Of the 333 firms that responded to the PLI survey, 77 percent report higher revenue than last year, with 67 percent seeing increases of 5 percent or more.

As a result, PLI remains readily available, and rates are flat. It is the first time Messmore remembers that everyone surveyed is carrying PLI—another sign of a robust industry.

"Even if carriers want rate increases, it is difficult due to the competition," says Mark Jackson, president of a/e ProNet and founding partner of JCJ Insurance.

Consistent and stable rates remain true, of course, unless a firm's loss experience or risk management practices require a higher rate, according to Kevin Collins, senior vice president and underwriting manager at Victor O. Schinnerer & Co.

Even though premiums usually rise when revenues grow, only 22 percent of Member Firms reported higher premiums.

"There is certainly ample capacity, but we are seeing carriers either pulling out or pulling back on their writing of PLI, while new ones continue to enter the market," says Al Rabasca, director of industry relations at AXA XL. "The challenge is many new carriers offer unrealistically, and in some cases, irresponsibly low premiums that could drive them out of the market."

CLAIMS COMPARISON

With more work comes more claims. The percentage of firms reporting more claims than the prior year is rising—from 17 percent in 2016 to 26 percent in 2017 and 30 percent in 2018. Communication and errors and omissions of a technical nature remain the largest factors in claims against design firms, at 59 percent and 56 percent, respectively. Third-party claims, project management, scope of services and contracts played a role in about one-third of the claims in 2018.

"As busy as everybody is, it is no wonder claims are generally increasing across the industry. Based on the volume of work, people could get stretched thin—there may be less focus on quality control because firms are trying to get things out the door," says Tim Haener, president and project manager at J-U-B Engineers, Inc.

Rabasca agrees, noting technical claims are rising, and while AXA XL does not yet have the data to fully identify the causes, it appears that a combination of the economy, availability of qualified professionals and poor quality control may be leading to this trend. He is also seeing increasing claims caused by inexperience or inappropriately supervised team members, both in the design and construction phases of the project. "Most of which could have been avoided or at least mitigated with properly trained professionals," says Rabasca.

Michael Dodd, general counsel at Shannon & Wilson, Inc., sees three common denominators in PLI claims: communication, observation and documentation.

"Designers should communicate what services are, and are not, included in very clear, precise language that a lay reader can understand," he says. "It is also critical to observe what is going on around you, not only in your work but from a health and safety standpoint."

Designers also should document everything they communicate and observe, according to Dodd. "You may have communicated something perfectly, but if it is not in writing, it did not happen, at least from a court's perspective," he says.

KPFF Consulting Engineers is experiencing slightly higher frequency and severity of claims, according to Jefferson Asher, managing principal. His main worry: senior-level employees being stretched too thin, which can lead to mistakes.

"I also see contractors and owners more interested now in getting into formal litigation battles, particularly on design-build projects," says Asher.

This project delivery method shifts much risk from owners to the design-build team and is becoming more popular. Referring to a recent $600 million lawsuit, Dodd believes such large projects have the potential to bankrupt a firm. "None of us, not even the largest firms, carry that much insurance," he says.

Among smaller and midmarket design firms, Jim Schwartz, U.S. A&E focus group leader and underwriter at Beazley, sees a hint of increases in frequency and severity of claims. "These are probably driven by higher limits being demanded by owners and clients," he says.

Furthermore, the limits required on state government projects in Virginia keep escalating and are generally non-negotiable, according to Jeffrey Lighthiser, president and CEO at Draper Aden Associates. "As a civil engineering firm, typically our role is pretty small compared with the cost of overall construction, yet we are being held to the same insurance limits as the architects," he says.

Project limits of $10 million per claim/$10 million aggregate are double from just four years ago, according to Lighthiser.

But Morgan West, president of PLAN and president and CEO at Dealey, Renton & Associates, observes that projects have increased in complexity and cost. "A hospital today, for example, is not what it was just a few years ago, and the limits have not really kept up," he says.

EVALUATING AND MANAGING RISK

When evaluating and managing risk, J-U-B uses a "go/no-go" checklist that includes three important risk control elements: whether it is a client J-U-B wants to work with, whether it is work J-U-B is competent in, and finally, the firm takes a serious look at the contract.

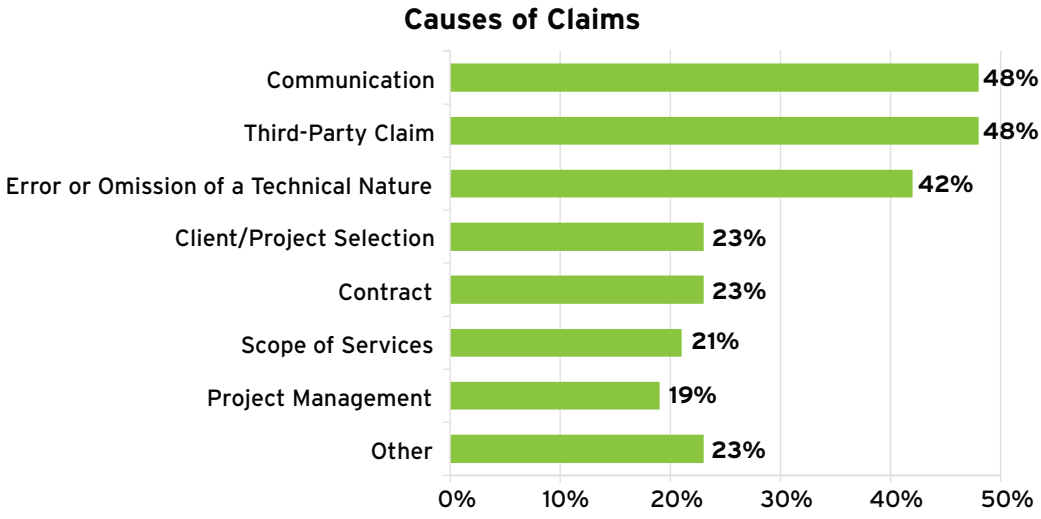
"If the contract is bad—uninsurable—that will stop us from moving forward," says Haener.

Many ACEC Member Firms follow similar strategies—49 percent frequently or sometimes turn down work, and the main factors are contract terms (69 percent), high risk (62 percent) and client history (53 percent).

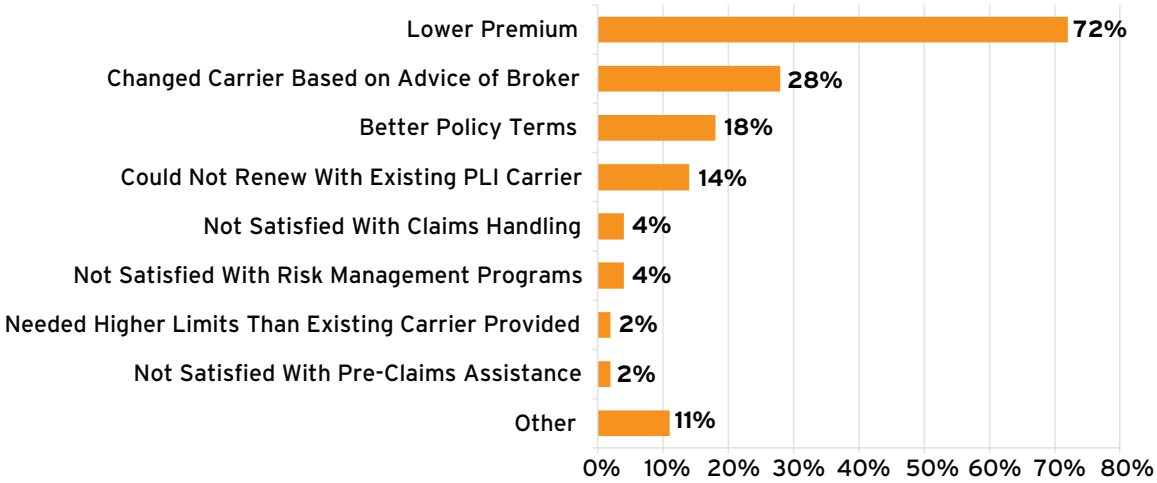
Even though it may go against his instincts to turn down work, Lighthiser will do so if there is a sense of increased risk with a potential client. "We evaluate the risk for every job, and sometimes we have to make challenging business decisions," he says. "But signing contracts with uninsurable language makes it difficult for other firms that do pay attention because if a claim arises, the only recourse might be to put that firm out of business."

KPFF also does not like to turn down work. However, when it does, which occurs infrequently, the reason is usually a record of problems with the client or contract terms so unreasonable they cannot be accepted, according to Asher. For every project, KPFF looks at whether the funding and schedule are sufficient, and whether the team has the necessary capabilities. "And we try to take a very sober approach when assessing that," says Asher.

"Contracts are an important means of managing risk but are becoming longer and more complicated, and owners are a little more unwilling than in past to make changes," says Joe Bunker, vice president and corporate secretary of Strand Associates, Inc. "We have not gotten involved in condos, schools, apartment buildings or geotech services,



Reasons Firms Changed PLI Carriers



which tend to be riskier," he says. "We have a risk management and business model that has worked for us for years, and we continue to follow it because it has been successful."

Another challenge facing engineering firms today is finding engineers to help with their workload, according to Jeff Connelly, program manager for the ACEC Business Insurance Trust and a broker at Greyling Insurance Brokerage, a division of Epic Insurance Brokers & Consultants. That concern about the shortage of engineers is shared by Collins, who urges firms to focus on the project management skills necessary to manage the growing workload.

Additionally, some firms are increasing training. Hanson is educating employees through its carrier's risk management program, while concurrently training project managers and staff to be sensitive to project risks and reinforce that Hanson's quality program is part of the company culture, according to Messmore. J-U-B is also investing in project management training for approximately one-quarter of its workforce, focusing on risk management, project planning and how to mitigate issues early before they develop into problems. In addition, J-U-B developed standard scope of work as well as project planning templates to ensure project managers do not miss anything and can better manage their teams, according to Haener.

Collins points out two notable survey findings about risk management: 21 percent of firms do not use their carrier's risk management programs, and 81 percent do not have in-house counsel or a full-time risk manager. Calling the use of risk management services a "key indicator" of firms with better claims history and profitability, Collins says, "Review of non-standard contracts and continuing education are best practices we see for designers."

CHOOSING A CARRIER

Overall, firms are happy with their PLI carriers—74 percent are at least somewhat satisfied with pre-claims assistance, 64 percent with claims handling and 72 percent with risk management programs. But perhaps the best indicator is that 92 percent of firms stayed with their existing carrier. Price was a driver for half of the 26 firms that changed carriers.

Firms should consider the carrier's reputation and the long-term value of its services when purchasing PLI because, at some point, you are likely to be sued, according to Collins.

"Firms that have claims learn quickly the importance of an experienced claims staff," says Jackson. "Many clients will pay a higher premium to go with a quality insurance company, as opposed to a carrier that is new to the A/E market or that does not have good claims service."

Strand values claims handling experience, the carrier's expertise and its relationship with the firm, according to Bunker. These factors are followed closely by the pool of defense attorneys available to the firm. Bunker adds that long-standing relationships with these attorneys are crucial in the pre-claims process. "If an issue evolves into a claim, it is important to be able to call the claim representative, have frank conversations and get the assistance we need," he says.

Clients that have good relationships with defense attorneys should make sure they can use the same defense attorneys if they switch carriers, Jackson says. And he encourages clients to stay

"Contracts are an important means of managing risk but are becoming longer and more complicated, and owners are a little more unwilling than in past to make changes."

JOE BUNKER
VICE PRESIDENT AND CORPORATE SECRETARY
STRAND ASSOCIATES, INC.

"Many clients will pay a higher premium to go with a quality insurance company, as opposed to a carrier that is new to the A/E market or that does not have good claims service."

MARK JACKSON, PRESIDENT
A/E PRONET
FOUNDING PARTNER, JCJ INSURANCE

with their carrier for at least three years.

"Firms may change carriers if they need to increase their limits and the current carrier would not or could not," says West. However, he adds that higher limits are typically available. West advises clients to look carefully at their options. "We give them as much information as we can as to what they can expect if they decide to make a change and what the relationship may be like if they move from a carrier they have had for some time," he says.

Several factors could influence a firm's decision to change PLI carriers, according to Connelly. These include fewer exclusions, more say in decisions about whether to settle through a favorable hammer clause and access to first dollar defense. He adds that firms may also change carriers if they are unsatisfied with a claim result or when they see rate increases resulting from a claim.

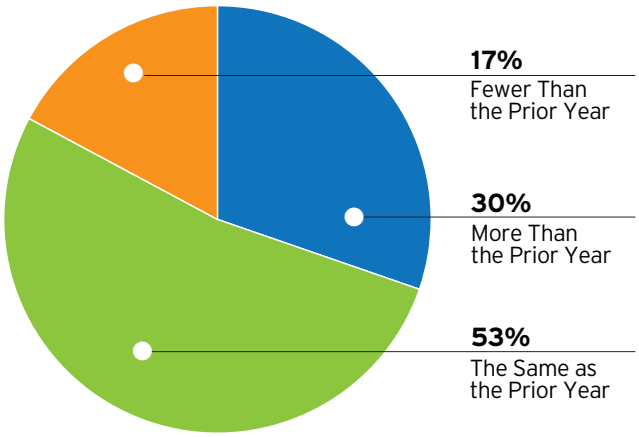
BROKER BENEFITS

One of the values specialist brokers offer is making sure a PLI carrier will be a good fit for the design firm, according to West. "Many PLI policies are similar, so it is up to the broker to analyze the options based on the risk tolerance, profile, types of projects and limits needed by a design firm," he says.

"Being specialized is very helpful for our clients," Connelly says. "While carriers do contract reviews, we prefer to do that ourselves. We have a better understanding of the client as we take on the responsibility to advise the firm on contracts." He adds that this relationship becomes especially valuable when firms begin shopping for PLI. "We have more knowledge of their claim history and the type of contracts used," he says, which enables Greyling to better advocate for the client.

"Oftentimes, we get new business because the firms are not getting great service from their current agent," says Jackson. JCJ Insurance offers contract review services and will provide in-house seminars even to smaller engineering firms.

Number of Claims Made Against Firms Compared With the Prior Year 2018



AREAS OF EMERGING RISK

When it comes to risk on the carrier side, carriers are watching for impacts from climate change. Schwartz notes that major weather events are typically followed by subrogation claims against designers arising from property damage. In other words, after the property insurer pays a loss, it may allege building design or drainage caused the problem. "It is reasonable to expect that to continue," Schwartz says.

Rabasca is concerned climate-change-related claims may impact the standard of care for design professionals. "When maps and codes have yet to catch up to the new reality, what are a design professional's obligations; are they expected to consider the risk of damages that can result from failure to take into account disasters caused by a changing climate; are they duty-bound to design for 'resiliency' even if codes and maps do not require it?" asks Rabasca. It is important to remember that compliance with code does not necessarily mean a design satisfies the standard of care. Accordingly, Rabasca recommends that "A/Es take steps to address potential climate change impacts on their projects and their liability by doing their homework, educating their clients, documenting their recommendations and asking clients to sign off on their ultimate decisions. If the client opts to ignore their recommendations, they should also request an indemnification," says Rabasca.

Electronic communications—which never disappear—remain a concern. "Even if you are successful in erasing it completely from your computer, someone else now has a copy," says Dodd. Another risk is the potential for data corruption. "The integrity of a document is no longer what used to be," he warns, as even password-protected files can be manipulated.

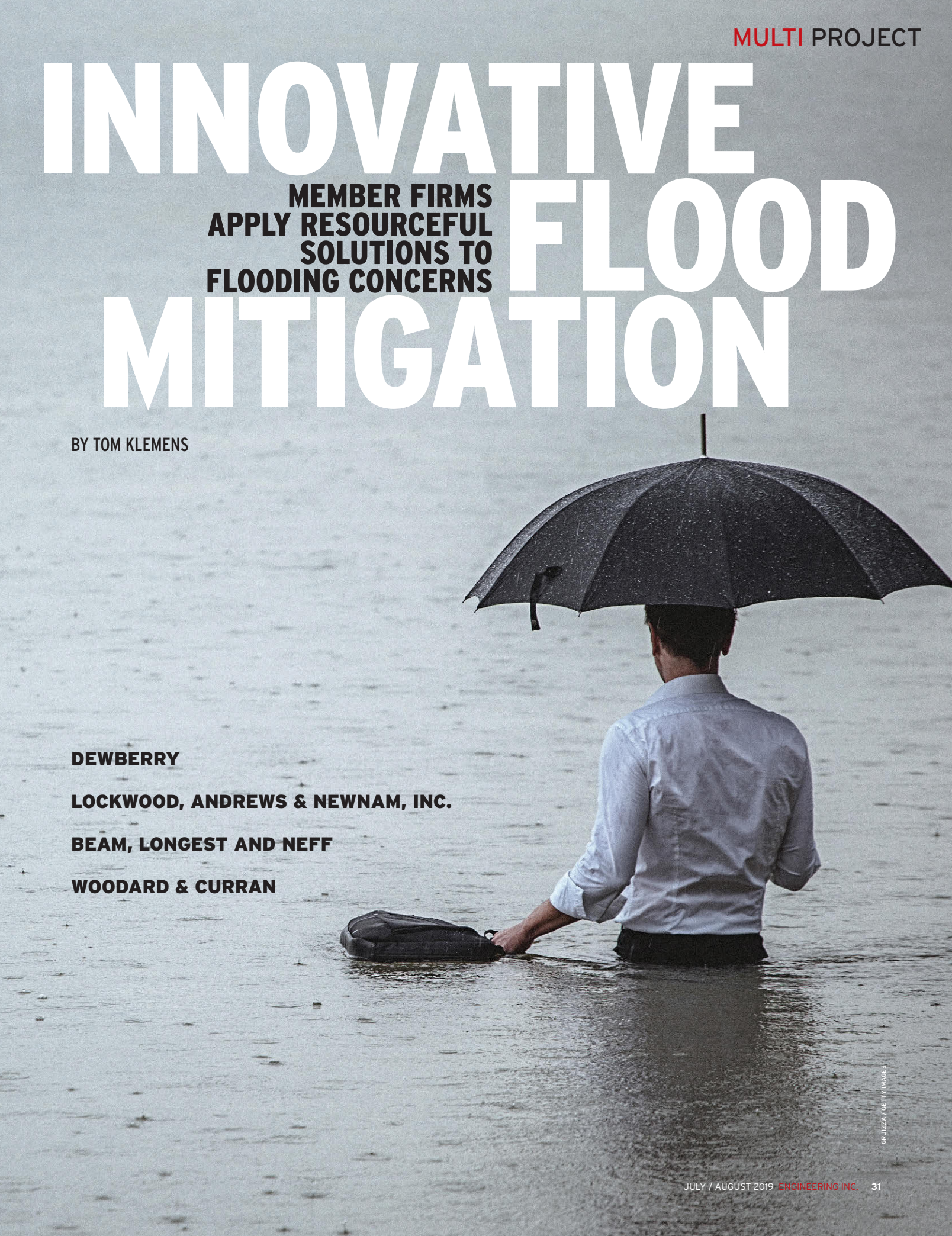
Schwartz is looking at how technology may shape future claims. Cybersecurity is an increasingly essential aspect of project design, and Schwartz is concerned about the impact on the standard of care from the need to hire cyber consultants. Especially as owners demand smarter, internet-connected buildings, Schwartz warns that if engineers do not design against the associated risks, or at least discuss them with project owners, they risk claims alleging they breached the standard of care. ■

***Maureen Conley** has more than 25 years of experience writing about science, engineering and government policy in Washington, D.C.*

INNOVATIVE FLOOD MITIGATION

MEMBER FIRMS APPLY RESOURCEFUL SOLUTIONS TO FLOODING CONCERNS

BY TOM KLEMENS



DEWBERRY

LOCKWOOD, ANDREWS & NEWNAM, INC.

BEAM, LONGEST AND NEFF

WOODARD & CURRAN

GRUIZZA / GETTY IMAGES

The conceptual plan for Red Hook's integrated flood protection system combines floodwall structures with raised roadways in order to avoid the need for deployable systems and maximize reliability.

DEWBERRY

Addressing Storm Surge

PROJECT: RED HOOK INTEGRATED FLOOD PROTECTION SYSTEM BROOKLYN, NEW YORK

FIRM: DEWBERRY NEW YORK

Established by the Dutch in 1636, the community of Red Hook is set on a low-lying peninsula in western Brooklyn, New York. Despite being one of the world's busiest freight ports in the mid-19th century, Red Hook experienced economic decline in the 20th century. In recent years, Red Hook continued to support trading activities and began to attract new residents and businesses.

During this resurgence, Red Hook suffered devastating flooding from Hurricane Sandy's storm surge in October 2012, leaving more than 75 percent of the community under water.

To address Red Hook's flood vulnerabilities, the New York City Economic Development Corp. (NYCEDC) partnered with the New York City Mayor's Office of Recovery and Resiliency (ORR) to identify measures to reduce flood risks in the community, from coastal storm surges to sea-level rise. NYCEDC hired Dewberry to direct a multidisciplinary team of consultants and conduct a feasibility study to evaluate existing and future flood risks, create conceptual design alternatives and develop a preferred alternative for an integrated flood protection system (IFPS).

Rahul Parab
Resiliency Group Director
Dewberry

Dewberry pioneered the creation of an integrated coastal and stormwater model that simulated the dynamics of a coastal storm surge and rainfall happening concurrently. The model included simultaneous hydrologic, hydraulic and hydrodynamic occurrences during a storm. It also provided a comprehensive understanding of existing flood risks that informed the development of the IFPS, which was tested against similar storm conditions within the integrated model.

Planning for the IFPS involved identifying various alignments for the flood protection system within the dense urban footprint.

"The challenge we had in this project was we had a set budget of $100 million," says Rahul Parab, resiliency group director for Dewberry. "We went through an extensive community engagement process to determine what would and would not work."

After reviewing each alternative for technical feasibility and obtaining feedback from the community, suitable locations and appropriate heights for the coastal flood risk reduction system were identified.

Engineering solutions combined floodwall structures with raised roadways to avoid the need for deployable systems, maximizing the reliability of the proposed system. The final plan included recommendations to raise Beard Street, which runs along the waterfront, and a street-level floodwall. A second floodwall, with a reinforced bulkhead, would be constructed at the Atlantic Basin. Drainage modifications would prevent the intrusion of a coastal storm surge into the combined sewer system.

"We are protecting to an elevation of 8 feet, which is close to today's 10-year coastal storm surge with a 1-foot sea level rise," says Parab. "The project components are designed in a way that will allow flexibility to extend in the future."

With the conceptual development project completed within budget and on schedule, the proposed IFPS solution was approved by NYCEDC and ORR in September 2017. The project currently is being designed.

From Water Hazards to Flood Control

PROJECT: EXPLORATION GREEN
CLEAR LAKE CITY, TEXAS

FIRM: LOCKWOOD, ANDREWS & NEWNAM, INC.
HOUSTON

A Houston golf course built more than 50 years ago is being transformed into Exploration Green, a new 200-acre community green space that also serves as a solution for flooding and drainage issues for the Clear Lake City Water Authority (CLCWA).

When recent storms demonstrated the effectiveness of the Exploration Green plan developed by CLCWA's engineering consultant, Lockwood, Andrews & Newnam, Inc., the project timeline was shortened from 15 years to five.

Currently surrounded by multiple residential subdivisions, the golf course was developed in the 1960s as part of a residential community on former ranch land. For years it was a popular community amenity, but use of the course dwindled over time. Local developers expressed interest in turning the golf course into a commercial property, but the community already was experiencing drainage issues due to increased runoff from the existing development. Residents approached CLCWA, which is responsible for providing water, sewage and drainage services in the area, for assistance. CLCWA purchased the golf course in 2011 with the plan to convert it into a series of detention ponds to improve stormwater management.

"The water authority is very aware of trying to anticipate that need for their residents," says Kelly Shipley, associate and team leader for Lockwood, Andrews & Newnam. "They have been planning this project for quite some time."

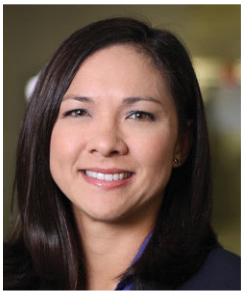
Stormwater retention was not required when these homes were built, but it has become increasingly important as the area has been built out. Acquiring the golf course gave CLCWA an opportunity to remedy this persistent problem.

Designed to handle a 100-year storm, the Exploration Green plan consists of five linked detention ponds with capacities ranging from 260 to 442 acre-feet. Each pond will have a 6-foot-deep permanent pool with the ability to detain significant amounts of stormwater from local streets, properties and waterways within the drainage area. As a flood threat eases, the ponds will slowly release detained stormwater, decreasing flooding.

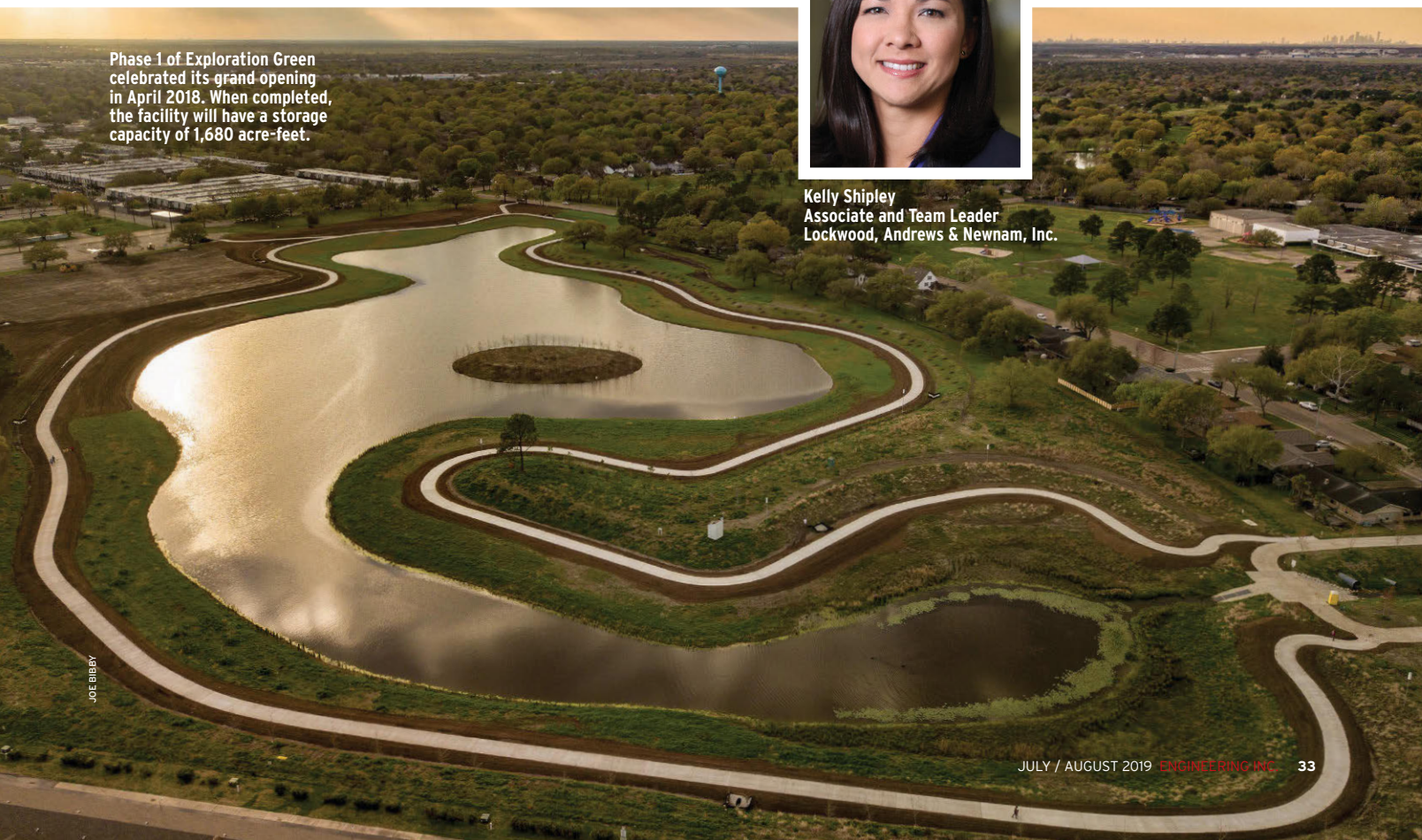
When completed in 2021, Exploration Green will have a storage capacity of 1,680 acre-feet. It will also include wetland preserves and 6 miles of hike-and-bike trails provided through the efforts of the Exploration Green Conservancy, a not-for-profit entity formed to oversee its conservation and recreational development.

Phase 1 opened in April 2018 and includes a W-shaped pond in the vicinity of the old clubhouse and driving range.

"The first pond was about halfway built when Harvey hit in August 2017, so we were able to utilize the detention during that event," says Shipley. "People were worried, especially in areas that previously flooded with Tropical Storm Allison. During Hurricane Harvey, either they did not flood or did not have as much water in the house as they did in those other situations. That really helped people see what this project could do."



Kelly Shipley
Associate and Team Leader
Lockwood, Andrews & Newnam, Inc.



Phase 1 of Exploration Green celebrated its grand opening in April 2018. When completed, the facility will have a storage capacity of 1,680 acre-feet.

JOE BIBBY

Expertise Yields Integrated Flood Protection

PROJECT: MCKINLEY POND PROJECT MUNCIE, INDIANA

FIRM: BEAM, LONGEST AND NEFF INDIANAPOLIS

The historic McKinley neighborhood is nestled in the northernmost crook of the White River as it winds through the center of Muncie, Indiana. Located downstream from where Muncie Creek empties into the White River, the area had long been vulnerable to severe flooding. But a new stormwater collection system, retention pond, pumping station and subsequent improvements protect residents against future flooding.

The oldest homes in this 40-acre neighborhood date back to 1895, which marked the beginning of 20 years of rapid growth. A levee constructed along the river after a flood in 1904 was no match for the Great Flood of 1913, which left the area under 22.6 feet of water, the highest river crest ever recorded in Muncie.

During the Great Depression, the river channel was dredged and widened as part of the Works Progress Administration. Storm sewers were installed and levee improvements took place, culminating in 1950 when the U.S. Army Corps of Engineers completed the new levee.

Even so, chronic stormwater overflow resulted in a cluster of homes falling into disrepair. The situation came to a head in 2011 when FEMA's certification of the old levee lapsed and the Indiana Department of Environmental Management (IDEM) mandated separating the area's combined sewers. The Muncie Sanitary District (MSD) had to act quickly.

MSD engaged the team of Beam, Longest and Neff, Christopher B. Burke Engineering and United Consulting—all ACEC Member Firms—to develop a solution. The team was tasked with addressing three key issues: separating the combined sewers in the area, per the IDEM mandate; updating the Elm Street levee and facilitating the removal of stormwater; and revitalizing the McKinley neighborhood.

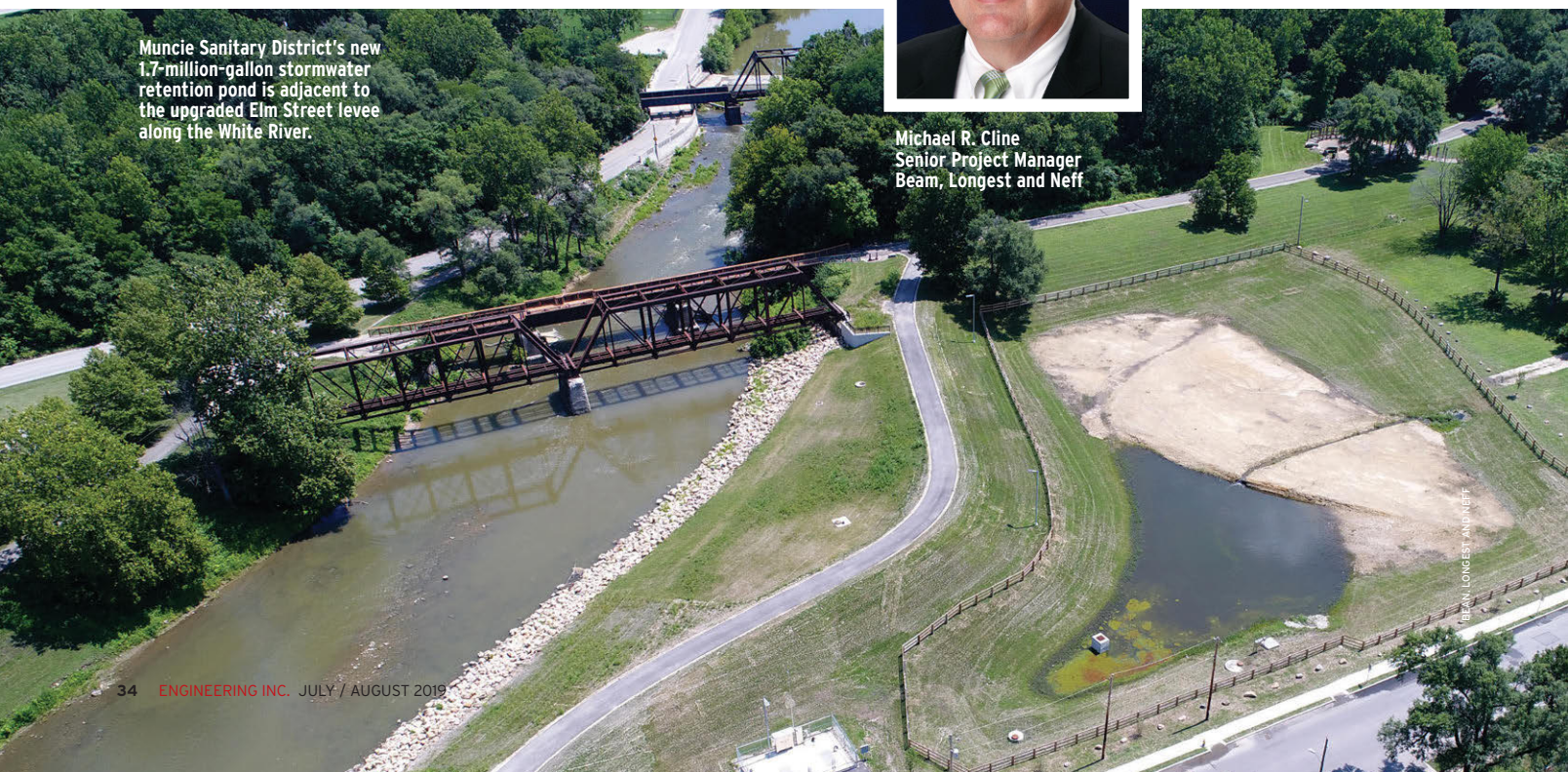
To accommodate the IDEM mandate, more than 40 storm sewer inlets in the neighborhood were disconnected and rerouted to a new 1.7-million-gallon stormwater retention pond. To modernize the levee and meet subsequent standards, the engineering team and MSD specified stormwater removal to withstand a 10-year storm event, even when the adjacent White River might be inaccessible during a 100-year flood event. To reach that goal, a 2,500-gallon-per-minute pumping station was installed to move pressurized floodwater captured behind the outdated levee through a 16-inch-diameter water force main through the new levee and into the river.

The retention pond was built on a low-lying area where more than two dozen dilapidated homes had been demolished. Engineers shaped the pond to fit the natural topography of the shallow bedrock. The pond design also included the reuse of excavated boulders and native tree plantings around the pond perimeter. Existing trails now extend into the levee area, providing connectivity and encouraging increased use of the green space as well as spurring neighborhood revitalization.

"It is already having an impact on the neighborhood," says Michael Cline, senior project manager for Beam, Longest and Neff. "Residents are doing more to keep their homes up, repainting and doing things they never would have done before. When we were standing outside inspecting the pumps, neighbors came over and said, 'This is just great; it is beautiful; it is wonderful.'"

Additional improvements in the McKinley neighborhood included curbs, sidewalks, fencing and preemptively installed signage to protect vehicles and pedestrians. The project was completed in 2018.

Michael R. Cline
Senior Project Manager
Beam, Longest and Neff



Muncie Sanitary District's new 1.7-million-gallon stormwater retention pond is adjacent to the upgraded Elm Street levee along the White River.

BEAM, LONGEST AND NEFF

The Upper Llagas Creek Flood Protection Project is employing a variety of strategies to preserve the established riparian ecology while at the same time reducing the potential for flooding.

Glenn Hermanson
Sr. Technical Practice Leader
Woodard & Curran

Preserving a Meandering Stream

PROJECT: UPPER LLAGAS CREEK FLOOD PROTECTION PROJECT SANTA CLARA COUNTY, CALIFORNIA

FIRM: WOODARD & CURRAN SACRAMENTO, CALIFORNIA

An innovative flood protection project in California's southern Santa Clara County is providing improvements to several Llagas Creek tributaries. Extending from the city of Morgan Hill in the north to Gilroy in the south, the project preserves the meandering quality of the streambed while also accommodating peak flows during storm events.

Historically, Llagas Creek and its tributaries flood during major storm events, affecting more than 1,000 homes, 500 businesses and 1,300 acres of agricultural land that sits within a 100-year floodplain. To provide critical flood protection to the surrounding area, the Santa Clara Valley Water District worked with Woodard & Curran to develop approximately 13.9 miles of stable stream channel that provides increased flow capacities, improved stormwater management, improved water quality and environmental habitat restoration.

The design reduced the project impact by widening the creek on only one side, allowing swaths of native riparian trees and habitats to remain. Woodard & Curran applied a modern geomorphologic analysis to the creek to determine a channel shape that would provide a more stable waterway not prone to incising or depositing sediment. To restore the creek habitat, existing topsoil and streambed material are being harvested and stored during the widening phase and will be placed back into the new channel during the latter phases of construction to support native revegetation plantings. By reusing the topsoil, the natural nutrients and native bacteria will help restore the creek to a natural state. Hundreds of instream complexities—such as logs, root wads, boulder clusters and turtle perches—will be constructed in the creek bed to provide habitats for endangered fish and other animals.

A high-flow bypass including a 2,100-foot-long tunnel has also been designed to convey high flood flows around downtown Morgan Hill, thus avoiding and minimizing impacts to the native creek channel, residences and businesses. Low flows will remain in the natural creek channel through downtown, thus preserving existing creek characteristics and vegetation.

"As the flow increases, the water level rises and begins to spill over a weir," says Glenn Hermanson, senior technical practice leader for Woodard & Curran. "That takes all the high flow out of the creek and puts it into a double box culvert, which then transitions into a tunnel under the hill." Adding the bypass effectively removed the city of Morgan Hill from the floodplain.

In addition, the project proposes to convert an existing rock quarry to wetlands and restore a remnant section of Llagas Creek to convey low flows for enhanced fish passage—both of which contribute to a healthier watershed and overall ecosystem.

The $172 million project is scheduled to start construction in 2019 and be completed by the fall of 2022, not including a three-year native plant establishment after construction. ■

__Tom Klemens__ is a freelance writer based near Chicago and a registered Professional Engineer in Illinois.

A HALF-CENTU

A charitable foundation is just one of the ways that RETTEW

BY CALVIN HENNICK

The RETTEW Charitable Foundation is less than a decade old. And yet, the firm it grew from—founded 50 years ago in Lancaster, Pennsylvania—has been promoting community service and charitable giving since the very beginning.

"We have always had a culture of giving back," says Mark Lauriello, president and CEO of RETTEW. "We have always believed that when we do well, we need to give back to the communities that support us. We believe we need to be good corporate citizens, and we have always had that belief."

Once a small family firm, RETTEW has grown considerably in the past few years, expanding to more than 350 employees across 11 offices in four states. The company was led by George "Hank" Rettew Jr. until his retirement in 2016, but earlier this year RETTEW became 100 percent employee-owned via an employee stock ownership plan. Throughout this growth and change, the firm's leaders and employees have sought to maintain the company's culture—one that emphasizes relationships as well as volunteer work and charitable giving.

RETTEW sponsored a night out at the Lancaster Barnstormers ballpark for the Boys and Girls Club.

RY OF CARING

helps employees stay involved in their communities

"From the founding of the firm, there was this family atmosphere and this ethic of giving back to our communities beyond the work we do as engineers," says Shawn Barron, director of marketing and communications, and chairman of RETTEW's employee philanthropy team. "Even though the company has evolved and we have moved away from family ownership, that is instilled in our culture: When you come to work here, it is an expectation that you will be involved in the community."

A NEW FOUNDATION

The company established the RETTEW Charitable Foundation in 2010 and began distributing grants two years later. To date, the foundation has given away $72,000 to over a dozen organizations, with a focus on nonprofits in three broad categories of interest: children and youth, community and the environment, and family stability.

The foundation is not interested in merely writing checks. Grant applications must come from organizations in which at least one of the firm's employees is personally involved, and must include some type of volunteer service by RETTEW employees.

"We want there to be hands-on employee involvement," says Barron. "It is a written expectation, right in the application. We ask, 'How would RETTEW and our employees be able to get involved in supporting this project?' Our employees get more connected to the charity through that volunteer component."

Leigh-Ann Fahnestock, corporate office manager for RETTEW and a member of the employee philanthropy team who has been with the firm for 32 years, sees the foundation as an extension of the long-standing culture of the company.

"It is really interesting to see the grant applications that come in because you get some insight into what employees are passionate about," she says.

Painting project for United Way Day of Caring.

RETTEW donated funds and helped elementary-school-age children build their first bike.

One grant application that stood out for Fahnestock came from Canine Partners for Life, an organization that trains service and companion dogs for people with physical and cognitive disabilities. An employee with a family member who is served by the nonprofit sponsored the application.

"We got to know that organization in a different way," Fahnestock says. "They named one of their new puppies after our CEO, and we watched the puppy grow into a dog. That was pretty rewarding."

An employee at RETTEW's Akron-Canton, Ohio, branch sponsored a grant for the National Court Appointed Special Advocate Association, a children's advocacy organization. Employees in the office worked during their lunches to pack duffle bags full of supplies purchased with the grant money.

"In some cases, people are giving back to organizations they are already involved with, and the foundation allows them to provide a little more funding or support than they can as an individual," says Jake Wilburn, regional vice president at RETTEW. "But also, when we are spending time together and doing a good thing as an office, people enjoy that."

COMMUNITY INVOLVEMENT

RETTEW's offices all participated in local community service initiatives before the formation of the foundation, and that has not changed—although there is now occasional overlap between the two. One year, the firm's Denver office helped obtain a $500 foundation grant to support work with Wish for Wheels, which provides a way for companies to buy and build new bikes for second graders at Title 1 elementary schools. But the Denver office works with the organization every year, with or without foundation support.

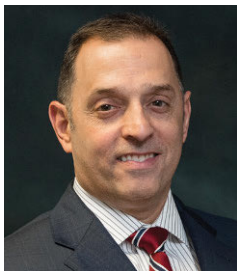
"We cannot do our work without partners like RETTEW," says Brad Appel, founder and executive director of Wish for Wheels. "We are grateful that RETTEW comes back every year, and we love them so much as a partner. It resonates as a community investment for them. By funding these bikes, they get to see a change in the community, they see a change in the kids and they see a change in themselves, as well. They get to know that they are changing a child's life by giving them this opportunity."

Wilburn says his office has painted buildings at a local chapter of the National Future Farmers of America camp, participated in the United Way Day of Caring, raised money for youth rugby programs and gathered donations for people in need during the holidays.

"I live 15 minutes away from the office, so I live and work in this community," Wilburn says. "It is important to me personally, and it is important to our staff to be engaged in our community."

Employees at the corporate headquarters have provided gifts and holiday meals to families in need, donated school supplies, raised funds for families with terminally ill children and participated in food drives, among other activities.

"It builds camaraderie amongst the staff," says Fahnestock. "It gives us the ability to interact with each other outside the work environment, and that builds stronger relationships. The stronger relationships are between employees, the more successful we are all going to be."



"We have always believed that when we do well, we need to give back to the communities that support us."

MARK LAURIELLO
PRESIDENT AND CEO
RETTEW

Lauriello echoes the idea that service projects bring benefits not just to the community, but also to RETTEW and its employees.

"It contributes to our brand in our local regions," he says. "We are

DEEP IMPACT

Over the past seven years, the RETTEW Charitable Foundation has awarded $72,000 in grants.

Year	Amount	Charitable Organization	Purpose
2012	$10,000	Schuylkill Headwaters Association	Tree planting
2012	$6,000	Canine Partners for Life	Pavilion and play yard construction
2014	$5,000	Various Charities	Holiday giving
2015	$7,500	Milagro House	Support for GED school
2015	$5,500	Church of the Brethren Youth Services	Funding for autism and language delays class
2015	$500	Ronald McDonald House Charities of Central PA	Video game system for playroom
2015	$500	Wish for Wheels	Bikes and helmets for children
2016	$5,000	Little Lehigh Chapter of Trout Unlimited	Creek restoration project
2016	$5,000	North Museum of Nature and Science	STEM Sisters program
2016	$3,500	Various Charities	Holiday giving
2017	$5,000	Lancaster Science Factory	Support for P.A.S.T.E. pre-K science program
2017	$5,000	Leg Up Farm	Support for Leading Change program
2017	$3,500	Various Charities	Holiday giving
2018	$3,500	CASA Board Volunteer Association	Backpacks full of necessities for children in need
2018	$2,500	Archie's Math	Funding for traveling math lab
2018	$4,000	Various Charities	Holiday giving

viewed as a very charitable company that steps up to the plate in terms of social responsibility, and employees appreciate knowing that their company is not just about the bottom line. That means a lot to people."

"It is important to me personally, and it is important to our staff to be engaged in our community."

JAKE WILBURN
REGIONAL VICE PRESIDENT
RETTEW

COMPANYWIDE GIVING CAMPAIGNS

Occasionally, RETTEW employees unite across regions to raise money for a single cause. According to Barron, the firm has organized this sort of companywide giving probably longer than anything else. However, the firm did not begin tracking donations until the company formed its foundation in 2010. Since that time, RETTEW employees have donated $67,000 to organizations such as the American Red Cross and the United Way. Most recently, RETTEW employees banded together to support the American Red Cross's work in the wake of Hurricane Harvey in 2017, raising $8,500.

Even in these large fundraising campaigns, RETTEW tries to involve employees in hands-on volunteer work. As part of the campaign for the American Red Cross, employees helped distribute smoke detectors to people living in low-income housing. "It is not just raising money," Barron says. "It is activities as well."

According to Fahnestock, the employee philanthropy team and RETTEW's senior leadership help decide when to launch a new giving campaign and which charities to support.

"We try to balance it with what offices are doing in their regions," Fahnestock says. "We look to the year ahead, and then we select what we think is going to be the best time of year to revisit it. We do not always necessarily do a corporate campaign, especially if there is already a lot of activity in individual offices."

While regional community service initiatives provide a bonding experience within individual offices, Fahnestock says, the companywide campaigns are an opportunity to unite the entire firm.

"We are spread out throughout all these different offices in all our different regions," she says. "Sometimes we do not get an opportunity to interact. It is great when we have a common goal, and we can work together to reach that goal and give back to the communities where we work." ■

RETTEW supports the Garden Spot Relay for Life annual walk and fundraiser.

__Calvin Hennick__ is a business, technology and travel writer based in Milton, Massachusetts.

ACEC 2019 Membership Survey

HIGHLIGHTS POSITIVES, AREAS NEEDING IMPROVEMENT

The recently released 2019 ACEC Membership Survey reveals a strong core of members who find significant value in their ACEC membership.

The survey of 777 Member Firm leaders, which was conducted between March 5-26, 2019, found that those surveyed approve of its overall direction and feel the Council is making positive gains. The survey results are being used as a foundation in development of the new strategic plan and will allow the Council to more effectively assess and respond to member needs, values, experiences and perceptions.

Results show 54 percent of respondents have C-level titles, 86 percent have a say in ACEC membership renewal, 81 percent have an ownership interest in their firms and 50 percent have been personally involved with ACEC for more than 10 years. Additionally, 87 percent are at least 45 years old, while only 2 percent are less than 35 years old.

"Too little replacement is happening of older engineers with new and younger engineers," says Andrea Pellegrino, principal for the Maia Marketing Group, which conducted the survey. "There is the beginning of a slow erosion, which is a real threat.

Respondents choose advocacy and education/professional development as the top two benefits ACEC provides for

MOST SIGNIFICANT INDUSTRY CHALLENGES
(OPEN-ENDED RESPONSES)

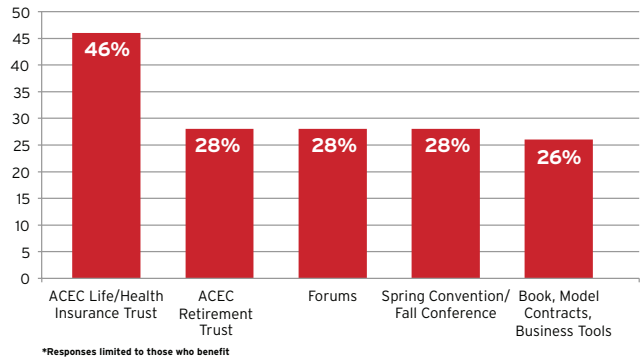
- Commoditization of engineering
- Economic uncertainty
- Finding, attracting, keeping qualified employees/ next generation
- Increased funding for infrastructure and public projects
- Regulations affecting the profession/industry

HOW TO IMPROVE EFFECTIVENESS

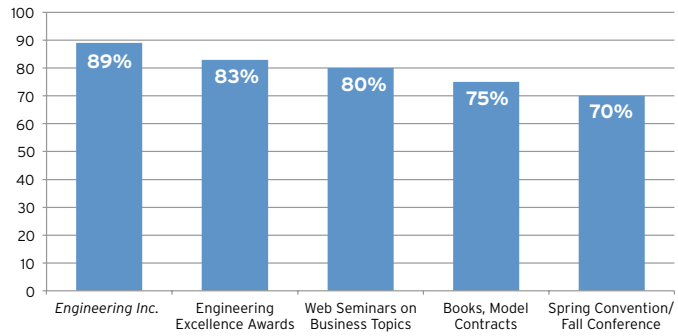
- Address needs of smaller firms
- Broaden range of priorities beyond infrastructure
- Involve more members in grassroots efforts
- Keep members AND public better informed
- Partner with state Member Organizations

SOURCE: 2019 ACEC MEMBERSHIP SURVEY

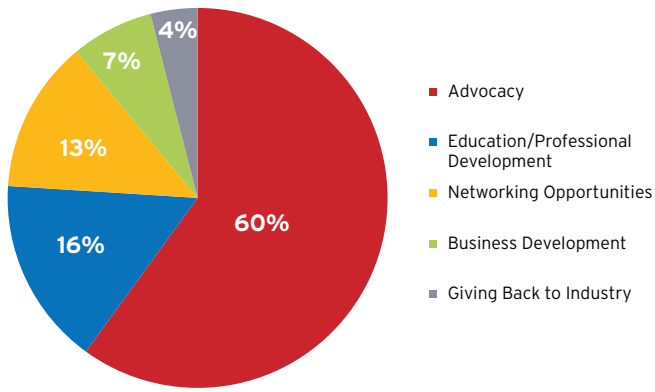
Top 5 Valued*



Top 5 Used



Most Valued Overall Benefits



a firm, with *Engineering Inc.* and the annual Engineering Excellence Awards as the top two most-used benefits.

The Life/Health Insurance Trust (46 percent) was clearly the most valued benefit, followed by a statistical dead heat between the ACEC Retirement Trust (28 percent); Forums (28 percent); the Spring Convention/Fall Conference (28 percent); and Books, Model Contracts and Business Tools (26 percent).

ACEC's advocacy efforts were strongly endorsed with nearly 2 in 3 respondents (62 percent) calling the program "extremely or very effective" while 25 percent rated them "somewhat" effective.

Respondents also pointed to their top advocacy preferences: increased funding for infrastructure (63 percent); protecting and expanding QBS (56 percent) and favorable tax treatment for engineers (41 percent).

"The real driver of membership at ACEC is advocacy," Pellegrino says. "And respondents clearly believe ACEC is doing a really good job."

Perceptions on the overall direction of the Council also received strong approval, with a majority (63 percent) affirming that ACEC is "making positive gains" compared with 28 percent that said ACEC was "staying constant."

Top choices on how the Council could increase its effectiveness were: broaden range of priorities beyond infrastructure; address needs of smaller firms; keep members and public better informed; partner with state Member Organizations.

When considering a list of 28 possible words to describe ACEC, the top five most frequent responses were: influential, valuable, effective, relevant and helpful. The most infrequently used labels were dynamic and energizing. ■

COMMENTS FROM RESPONDENTS

"**Increased energy level with new leadership and vision**. They are asking the right questions, recruiting the right staff in Washington and increasing the engagement with Member Organizations and members."

"Effective and meaningful relationships with legislators and governors. **Staff is continuously getting better and better**."

"I think the relationship between **national and the states could use further attention and review**."

"Our firm became members soon after we began operating. I truly believe that **we would not be here if it were not for the lessons we have learned and relationships we have developed through ACEC**."

"**ACEC excels at business management and leadership training.** We use others for more technical engineering."

"Letting members know what ACEC's specific goals are for the year and how it impacts small to large firms, **what they are going to do to accomplish those goals and then provide specific tangible results are what is needed**."

"If we have an issue with the business of engineering, **ACEC is the first resource we turn to**."

"It is obvious ACEC intends for this survey to produce meaningful feedback that it can use to align itself with the interests and needs of its members. **I am looking forward to the future of ACEC**."

Karen Erger

Lessons Learned Programs

WHAT THEY ARE, WHY YOUR FIRM NEEDS ONE AND HOW TO GET STARTED

BY KAREN ERGER

If your firm has paid "tuition" to the school of hard knocks in the form of unpaid fees, lost profits or professional liability claims, analyzing the causes of these problems and taking steps to prevent them on future projects can help you capitalize on that "investment."

One effective method of avoiding repeat mistakes is through a Lessons Learned program, which is defined by the ACEC Risk Management Committee as a "documented process for capturing, evaluating and sharing within the organization insights gained from liability claims, disputes or challenges encountered during the course of a project."

Lessons Learned processes can take many forms, including formal training workshops, brown bag sessions or the documentation of lessons in an internal database. And they need not focus on preventing bad outcomes—they can also help your firm replicate successful projects, processes and relationships.

WHY DOES MY FIRM NEED A LESSONS LEARNED PROCESS?

Why should your firm institute a Lessons Learned process? Is it worth the time and effort? Here are a few of the potential benefits:

- *Better project outcomes.* Lessons Learned programs help improve the quality of your firm's services, resulting in higher client satisfaction, and increase profitability.
- *Transition of institutional knowledge.* As a generation of firm leaders retires, Lessons Learned programs ensure the lessons of the past stay with those who will lead the firm into the future.
- *Jump-starting new leaders.* Young design professionals are being elevated ever more quickly to "responsible charge" positions. Lessons Learned programs enable them to successfully assume these new roles.
- *Defeating the "cannot happen to me" mentality.* Lessons Learned processes vividly demonstrate that even the best design professionals make mistakes. They also encourage your staff to get help when it is needed rather than going it alone and making problems worse.
- *Reduced incidence and impact of claims and disputes.* Preventing just one professional liability claim can pay for a Lessons Learned process, especially when deductibles and staff time spent on claims are taken into account.

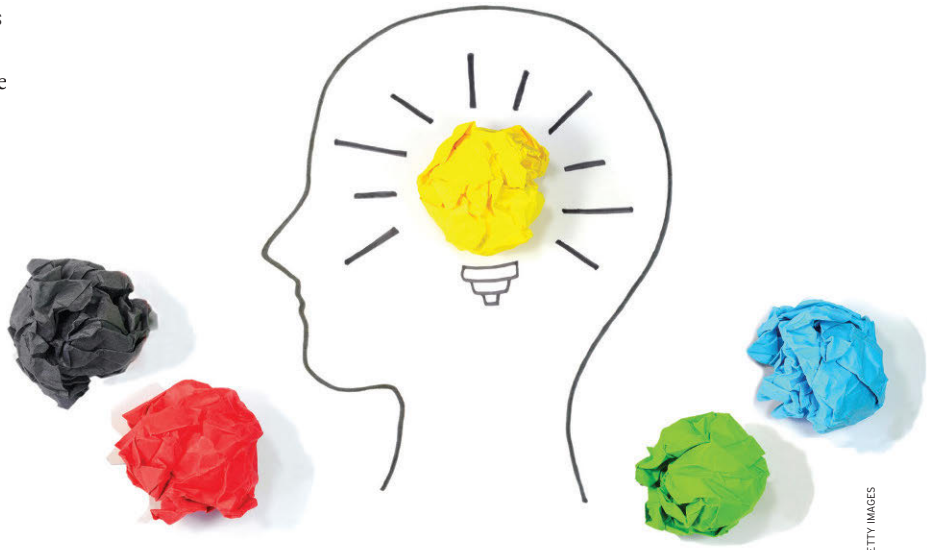
WILL A LESSONS LEARNED PROGRAM CREATE ADDITIONAL LIABILITY FOR MY FIRM?

Despite the value of Lessons Learned programs, some firms are reluctant to implement them because of concerns that doing so might expose them to increased liability.

If a Lessons Learned session identifies needed improvements to firm procedures, will that fact be cited as evidence of the firm's incompetence in some future lawsuit? What if the firm fails to implement those procedures on a project that becomes the subject of a claim?

Properly designed, a Lessons Learned program should not increase your firm's liability. Consult with experienced legal counsel when planning your Lessons Learned program. Because each state has its own rules regarding legal privilege, there is no one-size-fits-all Lessons Learned template.

Your legal counsel can advise you about the extent and nature



JAYK7 / GETTY IMAGES

of applicable legal privileges in the jurisdictions in which you do business—and how to structure your Lessons Learned processes so that sensitive information is protected. Legal counsel can provide critical input on Lessons Learned program design issues such as:

- Selecting appropriate projects to study.
- Determining a procedure for collecting project information.
- Identifying who should (and should not) participate in Lessons Learned sessions.
- Reviewing any written materials to ensure they are free of legal conclusions or other potentially damaging statements.
- Advising on implementation of any recommended changes to your firm's contracts, policies, procedures and processes.

Two states—Missouri and Kansas—have enacted "Peer Review" laws that create a legal privilege for in-house Lessons Learned programs (as defined by those statutes). Even in those states, however, consultation with legal counsel is essential to ensure that your Lessons Learned program will qualify for protection under these laws.

HOW CAN OUR FIRM IMPLEMENT A LESSONS LEARNED PROGRAM?

Many helpful resources are available to firms interested in implementing a Lessons Learned program, including those published by ISO and the Construction Industry Institute. ACEC's Risk Management Committee has published a "Development of Lessons Learned Programs" paper that can serve as a great starting point. The document is available at no charge on ACEC's website.

In addition to an outline of issues to be addressed in development of your firm's Lessons Learned program, the paper includes a series of Lessons Learned vignettes and a briefing for firm management regarding the risks and benefits of Lessons Learned programs.

Do not miss this opportunity to create continuous improvement in your practice and share the hard-earned experience of today's leaders with those who will guide your firm into the future. ■

Karen Erger *is senior vice president and director of practice risk management at Lockton Companies. She also is a member of the ACEC Risk Management Committee and can be reached at kerger@lockton.com.*

BlackRock Institute Report Assesses Climate-Related Risks

Residents of Fort Lauderdale walk through a flooded street that was caused by seasonal high tides and rising sea levels due to climate change. South Florida is projected to continue to feel the effects of climate change, and many Florida cities have begun preventive maintenance programs that include installing pumps or building up sea walls to try to combat the rising oceans.

Investors have failed to price in the impact of climate change in many of their long-term investments, according to a new report, "Getting Physical: Scenario Analysis for Assessing Climate-Related Risks," by the BlackRock Investment Institute. Looking at three long-lived asset classes—U.S. municipal bonds, commercial mortgage-backed securities and utilities—the report finds potentially trillions of dollars in unaccounted risk.

There are good reasons for this failure. First, the effects of climate change are slow and may seem beyond the term of the investment. Second, climate risks are hard to model geographically, especially down to the asset level, which is critical for investors. Finally, many use outdated data, such as flood-zone maps that are no longer accurate due to rising sea levels.

"Recent advances in climate and data science make it easier to overcome these hurdles and separate the signal from the noise," according to the report.

BlackRock teamed with the Rhodium Group, which utilizes big data in its research, to zoom in on the physical risks posed by climate change on a 12-mile-by-12-mile level across the country.

While Rhodium created 21 scenarios based on various global responses to climate change, the report concentrates on the "no-climate action" scenario. According to the report, "We see this as a tough, but plausible, scenario for stress-testing long-dated assets that can be located with precision."

Some **58 percent** of metropolitan statistical areas face climate-related GDP hits of 1 percent or more by 2060-2080 under a 'no climate action' scenario

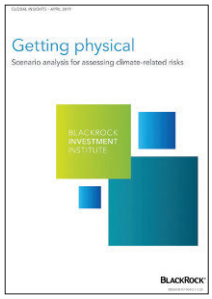
Of concern is the $3.8 trillion U.S. municipal bond market. "Some 58 percent of metropolitan statistical areas (MSAs) face climate-related GDP

hits of 1 percent or more by 2060-2080 under a 'no climate action' scenario," according to the report.

Furthermore, within a decade, more than 15 percent of municipal bonds (by value) will be issued by MSAs facing average annualized economic losses due to climate change of up to 1 percent of GDP.

Miami already suffers losses of more than 1.0 percent of annualized GDP today, and the report estimates, it could be as high as 4.5 percent of GDP by the end of the century.

The report also looked at commercial mortgage-backed securities (CMBS) because the underlying assets typically have life spans of several decades. Many CMBS assets are in metropolitan areas that face higher than average climate risks. For example, New York, Houston and Miami make up about one-fifth of CMBS properties by market value.



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Adding to the risk, BlackRock found that 80 percent of the CMBS assets in Miami and Houston are outside official flood zones; as a result, they may lack adequate insurance coverage.

Climate change also poses a big risk to electric utilities, with many power plants vulnerable due to aging infrastructure and outdated design standards.

According to the report, "Extreme weather risks already threaten utility stocks—and are set to rise in frequency and intensity over time—but are not fully priced in."

To read the full report, go to: **http://bit.do/BlackRock-climate-related-risks-report.**

"One of our core values is a focus on continuous improvement, so we seek to be a leader in the industry in bringing information to our clients."

LISA BROTHERS
CHAIR AND CEO
NITSCH ENGINEERING

Nitsch Engineering Client Seminar Series Focuses on Resiliency

In April, Nitsch Engineering held the latest in its long-running series of annual Client Seminars in Boston. More than 100 participants—including clients, friends, people who referred clients and Nitsch employees—attended the event, which focused on resiliency.

"One of our core values is a focus on continuous improvement, so we seek to be a leader in the industry in bringing information to our clients," says Lisa Brothers, chair and CEO of Nitsch Engineering. "We try to choose a topic that is innovative, cutting edge and provides a service to our clients. It is definitely not a Nitsch commercial."

Nitsch began its Client Seminars 19 years ago. Past topics have included smart cities, green infrastructure and how to get projects built in Boston. This year's focus is climate change and resiliency.

"We wanted to broaden the conversation for our clients and help them to look at resiliency from a regional perspective," says Brothers.

After Brian Creamer, a senior planner at Nitsch, set the stage with an overview of climate change and the importance of resiliency, Julie Wormser, deputy director of the Mystic River Watershed Association and founder of the Resilient Mystic Collaborative, addressed the need for a broad approach to climate change and resiliency.

"The Mystic River flows through 22 communities," says Brothers. "No single city or town can solve the problems facing the river on their own. In order to get anything done, they need to talk to each other and collaborate."

To drive the point home, Carri Hulet, senior mediator at the Consensus Building Institute, led an exercise in which all the participants played different roles in a meeting to improve stormwater management.

"Wearing a different hat really made people stop and think about the other people's point of view," says Brothers.

One of the lessons from the session especially applicable to the engineering industry is related to the reams of data around stormwater and rainfall intensities that Hulet provided.

"Sometimes you can have too much information," says Brothers. "All the data can be distracting."

After the event, Nitsch compiled all seminar handouts and notes and shared the information with attendees, along with a survey to obtain attendees' feedback.

More than 100 participants attended Nitsch Engineering's latest Client Seminar in Boston in April.

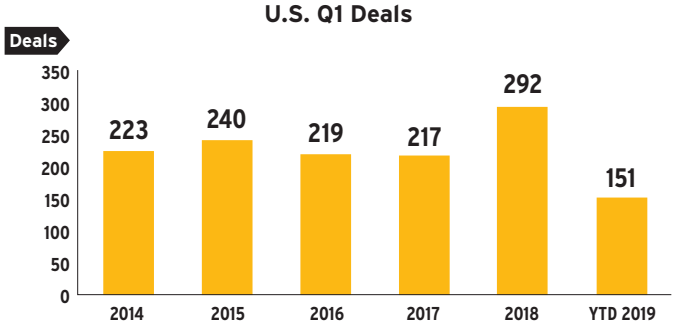
If your firm has an item to submit to *In the News*, **please contact Gerry Donohue at gdonohue@acec.org.**

Torrid Pace of Deal Activity Continues in 2019

BY NICK BELITZ

Global M&A activity in the A/E industry reached record levels in 2018, outpacing the previous high set in 2015. The frenetic pace of 2018, in which 396 transactions closed globally, has continued in 2019. Deal-makers announced almost 200 transactions globally through early June, putting global M&A activity in 2019 on track for yet another record year. Meanwhile, domestic M&A activity also reached a new high in 2018 with 292 transactions, a blistering 22 percent increase from the previous high set in 2015. Again, U.S. domestic deal-making has experienced robust activity through early June, with 151 deals announced, and the year is on track to outpace 2018.

Consistently strong deal activity in the industry is driven by a robust economy, sustained interest in M&A among sellers as a means of transitioning ownership and leadership, and the preference of buyers to quickly add capabilities and geographies to their portfolios. Interestingly, the latest data indicates a noted preference among buyers for deals in the Western U.S. Within the region, California leads the way with 20 deals to date in 2019. Dating back to 2015, Morrissey Goodale has tracked 138 deals in California, which outpaces even red-hot Texas and its 122 deals. But the Golden State is not the only place shining on the West Coast. So far in 2019, Washington and Oregon have already reached or surpassed their full-year 2018 deal totals. The two states complement California's deal activity and confirm the West Coast as one of the hottest spots in the country for domestic deal-making, rivaled only by the states of Texas and Florida. Additionally, deal-making remains active with Colorado, Washington and Oregon recording 46, 31 and 18 deals, respectively, since 2015.



So why all the interest out West? We offer the following reasons:

1. **Western demographic and economic growth expectations bode well for everything the engineering industry offers.** Because of the Western states' strong population growth trends and need to invest in critical transportation and water infrastructure, numerous firms have sought to build and expand a Western presence. For example, publicly traded NV5 (Hollywood, Fla.) closed two deals in the West so far this year—the acquisition of Alta Environmental (Long Beach, Calif.) and the acquisition of J.V. Surveying (Phoenix), the latter of which grows the firm's footprint in the very active Arizona and California markets. Also, private-equity-backed CONSOR Engineers' (Houston) recent acquisition of Structural Grace, Inc. (Tucson, Ariz.), not only builds the firm's expertise in bridge and transit projects but also is intended to provide a foundation for future expansion in the region. Also in April, Gannett Fleming (Camp Hill, Pa.) acquired SAGE Engineers (Roseville, Calif.) to expand the firm's geoscience, geostructural, power and dam services in California. This deal closely follows Gannett Fleming's 2018 acquisition of KEH & Associates (San Marcos, Calif.), a water and wastewater engineering firm. And in March, SmithGroup (Detroit) entered the Rocky Mountain region via a merger with specialized planning firm Paulien & Associates (Denver).
2. **Big Midwestern names want to be bigger out West.** The key economic drivers mentioned earlier have encouraged larger *ENR*-ranked firms not based in the Western states to push west, with some of the most well-recognized industry names from the nation's heartland making deals. Notable recent acquirers based in the Midwest: IMEG Corp. (Rock Island, Ill.), SEH (St. Paul, Minn.), Woolpert (Dayton, Ohio), HDR (Omaha, Neb.), Barr Engineering (Minneapolis), Sargent & Lundy (Chicago), Perkins+Will (Chicago) and Wunderlich-Malec Engineering, Inc. (Eden Prairie, Minn.), have closed transactions in the Western states.

Given the trends at the macro level and competitive pressures within the engineering industry, we expect a sustained level of deal-making for the remainder of 2019, with expansion in the West to remain a top priority for industry leaders and decision-makers.

ACEC DEAL-MAKERS

MAY 2019

Growing A/E and geospatial firm **Woolpert** (Dayton, Ohio) acquired **Geomatics Data Solutions, Inc.** (Hillsboro, Ore.),

a marine and terrestrial survey data firm. Woolpert is an ACEC member.

ACEC member **Tetra Tech** (Pasadena, Calif.) has agreed to acquire engineering, design, project management and environmental consultant **WYG** (Leeds, U.K.) in a deal that values the business at £43.4 million (more than $50 million).

ACEC member **HDR** (Omaha, Neb.) acquired architecture, planning and urban design firm **Calthorpe Associates** (Berkeley, Calif.). Going forward, Calthorpe Associates will do business as HDR|Calthorpe.

Multidisciplinary consultant **Quincy Engineering** (Rancho Cordova, Calif.) merged with public infrastructure engineering firm **Murraysmith** (Portland, Ore.). Quincy Engineering and Murraysmith are both ACEC members.

Leading transportation and water resources firm **CONSOR Engineers, LLC** (Houston) acquired regional bridge and transit specialist **Structural Grace, Inc.** (Tucson, Ariz.). The acquisition is the first step in CONSOR's strategy to grow into the Western U.S. transportation and water markets. Both firms are ACEC members.

ACEC member **Goodwyn, Mills and Cawood** (Montgomery, Ala.) acquired **Hutchinson, Moore & Rauch, LLC** (Daphne, Ala.), an engineering, surveying and land planning firm.

Marquez Environmental Services, Inc. (Golden, Colo.), an environmental management consulting services firm, joined **Barr Engineering** (Minneapolis), an ACEC member.

Power engineering consultant **Sargent & Lundy** (Chicago) acquired **ARES Corp.'s** (Burlingame, Calif.) energy business, **ARES Energy Services Division**. Sargent & Lundy is an ACEC member.

APRIL 2019

Employee-owned **Merrick & Co.** (Greenwood Village, Colo.) acquired the **Benham** oil, gas and chemicals business (Oklahoma City) from **Haskell** (Jacksonville, Fla.). Both firms involved in the deal are ACEC members.

ACEC member **Farnsworth Group** (Bloomington, Ill.) acquired architecture firm **Design Alliance** (Waukee, Iowa).

ACEC member **KCI Technologies, Inc.,** (Sparks, Md.) acquired **Hoehn Landscape Architecture, LLC** (Towson, Md.), a landscape architecture and land planning firm.

ACEC member **Century Engineering** (Hunt Valley, Md.) acquired civil engineering and surveying consultant **Little & Associates, Inc.** (Towson, Md.), expanding the firm's growing civil and land development service area.

ACEC member **LJB, Inc.** (Dayton, Ohio) acquired water resources engineering firm **JEWELL Engineering Consultants** (Kernersville, N.C.). The acquisition strengthens LJB's hydraulic and hydrologic service offerings.

ACEC member **Eco Engineering** (Cincinnati), a design-build firm specializing in lighting systems, acquired lighting services firm **InVision Technologies, Inc.** (Coppell, Texas).

ACEC member **Jacobs** (Dallas) entered into a definitive merger agreement to acquire **KeyW Holding Corp.** (Hanover, Md.), capturing the leading position in the multibillion-dollar space intelligence market and the high-growth C5ISR sector.

Sandman Structural Engineers (Moorhead, Minn.) acquired **Structural Design Associates** (Champlin, Minn.), a structural engineering firm that serves the educational, industrial, governmental and medical sectors. Structural Design Associates is an ACEC member.

ACEC member **Partner Engineering and Science, Inc.** (Torrance, Calif.) acquired **Eco Advisors, LLC** (Palm Beach Gardens, Fla.), an environmental and industrial hygiene services firm.

ACEC member **Century Engineering** (Hunt Valley, Md.) acquired construction management, inspection and surveying firm **NXL Construction Services** (Richmond, Va.).

Full-service civil and environmental engineering consultant **Fuss & O'Neill** (Manchester, Conn.) acquired **Sailer Environmental** (Madison, Conn.). Fuss & O'Neill is an ACEC member.

ACEC member **NV5** (Hollywood, Fla.) acquired land surveying and mapping firm **J.V. Surveying** (Phoenix). The acquisition marks NV5's third deal of 2019.

ACEC member **Tetra Tech** (Pasadena, Calif.) acquired **eGlobalTech** (Arlington, Va.), an IT solutions, cybersecurity and management consulting firm serving the federal government.

ACEC member **Parametrix** (Seattle), a 100 percent employee-owned engineering, planning and environmental services firm, acquired civil and structural engineer **Aptum** (Camas, Wash.).

ACEC member **GEC, Inc.** (Baton Rouge, La.), is slated to be sold to investor Cary Goss, owner of **Industrial Fabrics, Inc.** (Baton Rouge, La.). Goss himself, not Industrial Fabrics nor one of Goss' other businesses, will be the buyer and owner of GEC.

International engineering firm **Thornton Tomasetti** (New York) acquired **Becker Structural Engineers, Inc.** (Portland, Maine), a firm specializing in mass timber, parking structures and highway bridge projects. Both firms are ACEC members.

MARCH 2019

8-koi (Melbourne, Fla.) acquired multidiscipline engineering and construction firm **Cape Design Engineering Co.** (Merritt Island, Fla.), an ACEC member.

ACEC member **Barton & Loguidice** (Liverpool, N.Y.) acquired hydrogeological and environmental consultant **Advanced Land and Water** (Eldersburg, Md.). ■

To view the most up-to-date and "live" versions of the M&A heat maps, and to see who are the buyers and sellers in each state, go to www.morrisseygoodale.com.

Nick Belitz is a principal with Morrissey Goodale, LLC, a management consulting firm that specializes in the A/E industry and provides strategic business planning, merger and acquisition, valuation, executive coaching, leadership development and executive search services. He can be reached at **nbelitz@morrisseygoodale.com**.

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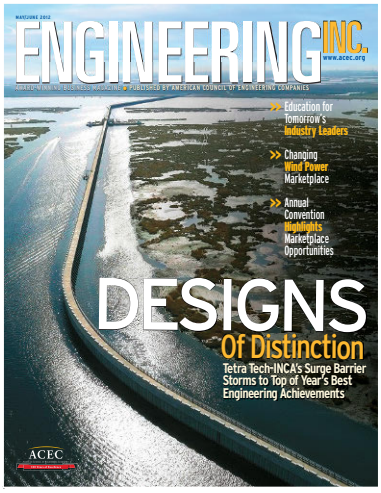


Contact Rachael Ng, Director, Exhibits and Vendor Fulfillment, at 202-682-4337, by e-mail at rng@acec.org, or visit http://www.acec.org/advertising/

On the Move

David E. Ott was appointed chairman, president and CEO of St. Paul, Minnesota-based **Short Elliott Hendrickson, Inc.**, succeeding former president and CEO **Sam Claassen**, who retired in June 2019 and is now CEO emeritus. Ott formerly served as senior vice president of special programs, environment and infrastructure solutions at Wood, and as senior vice president of construction services at Amec Foster Wheeler.

Edward Codispoti joined Hollywood, Florida-based **NV5** as CFO, succeeding former CFO **Michael Rama**. Codispoti formerly served as CFO of Ilumno Holdings, a provider of higher education and education technology in Latin America.

Meredith Keyes joined Raleigh, North Carolina-based **S&ME, Inc.**, as CFO. Most recently, Keyes served as the North American CFO of Chiltern International, Inc., a global contract research organization where she also led multiple mergers and acquisitions.

Jay Clare joined San Diego-based **Kleinfelder** as senior vice president of strategic growth. Clare, who is based in Kleinfelder's Oakland, California, office, formerly served as senior vice president at AECOM.

Brandon Swartley was promoted to vice president of New York-based **STV**. Swartley is the Transportation & Infrastructures Division's chief electrical engineer of power systems and is based in the company's Philadelphia office.

Paul Leef joined Detroit-based **SmithGroup** as vice president, serving as the studio leader for campus strategy and analytics, following the company's merger with **Paulien & Associates, Inc.**, where Leef served as president. Leef is based in the company's Denver office.

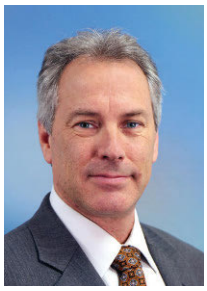
New York-based **WSP USA** announced the following appointments: **Sharon Kelly** joined the company as a vice president and senior project manager and will be responsible for leading planning and environmental work on large transit projects nationwide. She is based in the company's Portland, Oregon, office. Kelly formerly served as transportation planning program manager at HDR. **John Drayton** was named national leader for transit and rail zero-emissions technology. Drayton, a WSP senior principal technical specialist, formerly served as director for vehicle technology for the Los Angeles County Metropolitan Transportation Authority. He is based in the company's Los Angeles office.

Plymouth, Michigan-based **SME** named **Michael S. Meddock** regional vice president for Ohio and Indiana, where he will oversee and coordinate project management, technical report review, project planning and business development. He is based in the company's Columbus, Ohio, office.


David E. Ott


Edward Codispoti


Meredith Keyes


Jay Clare


Brandon Swartley


Paul Leef


Sharon Kelly


John Drayton


Michael S. Meddock

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Kitchell CEM
Phoenix

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Orlando
Atlantic Engineering Services
Jacksonville
Axiom Consulting Engineer, LLC
Tampa
Beacon Civil Engineering, LLC
Tampa
Boyd Civil Engineering, Inc.
Orlando
CES Consultants, Inc.
Pembroke Pines
Choice Engineering Consultants, Inc.
Miami
Comak Group, Inc.
Wellington
CRT Design and Engineering, Inc.
Jacksonville
Eda Engineers-Surveyors-Planners, Inc.
Gainesville
GEC, Inc.
Jacksonville
Gortemoller Engineering, Inc.
Panama City Beach
H. William Persons, PE
Jupiter
KPM Franklin
Kissimmee
MDM Services, Inc.
Lakeland
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Heath & Lineback Engineers, Inc.
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Atlanta

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Heritage Engineering, LLC
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Boston

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SUPERSTRUCTURES Engineers + Architects
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TriState Planning Engineering and Land Surveying, PC
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ACEC/North Carolina
Atlantec Engineers, PA
Raleigh
BRE Engineers
Raleigh

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Dallas
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Austin
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Houston
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Elkhorn
Pierce Engineers, Inc.
Milwaukee

CALENDAR OF EVENTS

SEPTEMBER
- **10** Identify When, Where and How to Increase Profit With Value-Based Pricing (online class)
- **11** Dealing with Cost Escalation and De-Escalation in a Trump Tariff World (online class)
- **12** Workplace Violence and Firearms—A Risk Management Discussion (online class)
- **16-17** Information Technology Forum—2019, Denver
- **16-17** Human Resources Forum—2019, Denver
- **16-17** Finance Forum—2019, Denver
- **17** What's the Secret to Achieving Your 2019 Strategic Goals & Beyond? (online class)
- **18** Why Your Internal Ownership Transition Plan is Failing (online class)
- **19** Keys to an Effective Growth Strategy (online class)

OCTOBER
- **1** How to Navigate the DOE Loan Program for that Innovative Project (online class)
- **8** Recession-Proof Your Firm (online class)
- **10** Talent Retention (online class)
- **13-16** **ACEC Fall Conference, Chicago**
- **24** Effective Contractual Risk Mitigation (online class)
- **29** Acquisitions—How and What to Look for During Due Diligence (online class)
- **30** Managing Multiple Projects (online class)
- **31** Super Busy? Here's 60 Minutes to the Polished Presentation (online class)

To sign up for ACEC online seminars, go to **www.acec.org/education.**

Additional information on all ACEC activities is available at www.acec.org.

Welcome New National Affiliate Members

Strategic Planning and Management Consulting
Kogan & Co.

For further information on one of the national affiliate members, go to: http://bit.do/ACEC-natl-affiliate-memb or contact Rachael Ng at 202-682-4337 or rng@acec.org.

Forums to Meet in Denver Sept. 16-17; Pathways Class Four Offered at Fall Conference in Chicago

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HR, IT AND FINANCE FORUMS TO MEET SEPT. 16-17 IN DENVER

Providing two days of peer-to-peer information sharing, problem-solving and networking, ACEC forum workshops help members make sense of current concerns and emerging trends impacting the A/E workplace.

HR, IT and finance firm leaders and directors will discuss common problems, benchmark processes, share experiences and network with their peers in an informal roundtable format, all of which continues post-forum via active online communities.

The in-person forum meetings will be held Sept. 16-17 at the Sheraton Denver Downtown Hotel. For more information on each and to register, visit:

- HR Forum: http://bit.do/acec-2019-HR-forum
- IT Forum: http://bit.do/acec-2019-IT-forum
- Finance Forum: http://bit.do/acec-2019-Finance-forum

NEW AND UPDATED EJCDC PROCUREMENT DOCUMENTS

The newly released Engineers Joint Contract Documents Committee 2019 Procurement (P-Series) Agreement Documents improves the clarity, content and risk allocations of core documents from the 2010 P-Series.

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Composed of 10 integrated documents, including two that are brand new, the updated P-Series is well-suited to a wide variety of purchase transactions, especially those where the materials or equipment are of a complex or critical nature.

For more information, visit: **http://bit.do/2019-ejcdc-procurement.**

PATHWAYS CLASS FOUR KICKS OFF AT ACEC FALL CONFERENCE IN CHICAGO

ACEC's Pathways to Executive Leadership program is a six-month leadership development program aimed at midcareer A/E professionals who are making the transition to managing offices and teams. The course consists of two in-person sessions at ACEC national conferences and three interactive online learning sessions.

Limited to 24 participants, sessions focus on developing personal mastery, enhancing delegation skills, building a strong client base and learning how to use industry trends to build a thriving engineering firm.

Class Four will kick off Oct. 12-14 in Chicago during ACEC's Fall Conference. Review the full agenda and register at **https://programs.acec.org/2019-pathways/.** ■

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