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At print time, President Trump was touting the sincere possibility of even more new tariffs after a week of meetings between United States and Chinese leaders. As we reported in theHuddle, the tax on \$200 billion worth of imports will hurt farmers and chemical manufacturers the most, but the construction industry will also see some negative effects. With confidence shifting and uncertainty looming, now is as good a time as any to check on your company's finances. In this issue, we're talking economic effects on the construction industry; how to clean up accounting with smarter systems; and payroll practices to help raise awareness about financial functions. Turn to page 28 for a glimpse into construction's economic profit curve and what that might mean for your business this year.

With accounting on the brain, our team is headed to the Construction Financial Management Association's (CFMA) Annual Conference & Exhibition in Las Vegas, Nevada. Every year, attendees from various areas of construction accounting and insurance are provided with educational opportunities and networking experiences. This will be our ninth consecutive June spent learning from the industry's top financial experts and suppliers. Look for our post-conference coverage in the July issue, where we'll dive into lessons learned across the 5-day conference.

Leading with lessons, I want to remind you that CBO has a wealth of educational webinars available at constructionbusinessowner.com/webinars, where you can explore the archives and register for upcoming events like "How Technology Has Transformed the Role of the PM," taking place June 27 at 2 p.m. EDT. In this webinar, experienced project manager (PM) and leader in the field Andy Keidel of Fogel-Anderson Construction Co. will share his insights on how technology has revolutionized the role of PM. We'll cover three crucial project management challenges and how you can bring much-needed innovation and long-term success to your projects. Join us to hear Keidel share how technology gives him a competitive edge by keeping teams on the same page, creating seamless processes and maintaining accurate information. Join us to hear firsthand stories and strategies around the challenges PMs face and the right technology solutions for any size project and team. Then, stick around after the presentation for a live Q&A session.

One last note: We would love to hear from you! Our editorial team is always looking for feedback from readers about the content we provide, the troubles you face and the trends you'd like to learn more about. Shoot me an email at kwells@cahabamedia.com and let's chat.

Take good care,

Kathy Wells

In April, Associate Editor Rachel Fulford attended JBKnowledge's ConTech Roadshow, Atlanta, where she studied industry technology trends, advancements and solutions. Pictured here, Fulford participated in the largest virtual-reality meeting ever, a collaborative prefab session led by Visual Vocal CEO and co-founder, John SanGiovanni. For more, visit constructionbusinessowner.com/tech-state.



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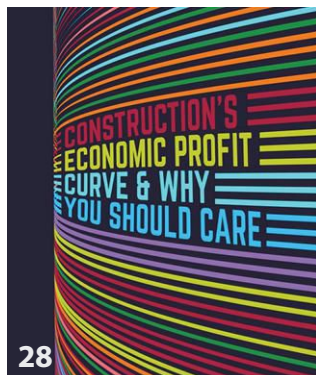


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without breaking the bank.”

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► Doosan Infracore Forms Partnership with Palantir Technologies

Doosan Infracore has formed a strategic partnership with Palantir Technologies for the first time in Korea, as part of an effort to accelerate digital transformation. Palantir is a Silicon Valley-based big-data startup that provides a data analysis platform to organizations in various fields, ranging from the public sector, to finance, to manufacturing and is to be used for arresting criminals, preventing financial risk, improving productivity and product quality, etc. With Palantir, Doosan Infracore will build a big-data platform to optimize the business operation and speed up the decision-making process. More specifically, the company will visualize data across businesses, including sales, production, research and development, quality control, customer services, and internet of things (IoT) solution DoosanCONNECT to establish a platform for collaboration between businesses, boosting effectiveness in operation. Visit doosanequipment.com

► Melanie S. Richardson Joins National Asphalt Pavement Association



Melanie S. Richardson

The National Asphalt Pavement Association (NAPA) hired Melanie S. Richardson as its new vice president for finance and operations. Richardson brings more than 26 years of experience with nonprofit membership associations in executive roles ranging from finance and accounting to operations. Richardson will oversee the financial management and the day-to-day operational activities of NAPA, a 501(c)(6) trade association serving the asphalt pavement mixture-production industry and its affiliated 501(c)(3) arm, the

NAPA Research and Education Foundation. She will also help set and oversee the association's strategic direction. Richardson holds a bachelor's degree in history from Colgate University and a certificate in nonprofit management from Georgetown University. Visit asphaltpavement.org.

► Universal Forest Products Inc. Acquires Wolverine Wood Products Inc.

Universal Forest Products Inc. has announced that one of its affiliates closed on the purchase of the operating assets of Wolverine Wood Products Inc., a Grand Rapids, Michigan-based manufacturer of wood panel components for furniture, store fixtures and case goods. The previously announced acquisition expands Universal Forest Products' capabilities to produce value-added wood components for customers in the Midwest. Mike Petersen, owner and president of Wolverine Wood Products, is remaining with the company as general manager. Visit ufpi.com.

► Hannah Altomare Promoted to Senior Account Manager at RT Specialty LLC



Hannah Altomare

Hannah Altomare has been promoted to senior account manager within Ryan Turner (RT) Specialty LLC's National Environmental and Construction Professional Liability Practice (ECP). She is responsible for supporting the company's new business and marketing efforts in addition to providing brokers, agents and their customers with timely and insightful renewal and coverage information. Altomare holds a bachelor's degree in business administration from the Fox School of Business at Temple University, as well as associate degrees in claims and risk management. In addition, she is

pursuing the chartered property casualty underwriter (CPCU) designation. Visit newday.rtspecialty.com.

► Orbcomm Inc. Announces Dean Milcos as CEO



Dean Milcos

Orbcomm Inc., a global provider of machine-to-machine (M2M) and IoT solutions, has announced the promotion of Constantine "Dean" Milcos to executive vice president (EVP) and chief financial officer (CFO). Milcos will oversee the company's financial operations, including financial planning and reporting, accounting, tax and treasury functions. Milcos joined Orbcomm in 2013 and most recently served as Orbcomm's senior vice president (SVP) and chief accounting officer (CAO) since 2013, and interim CFO from May to September 2018. Milcos holds a bachelor's degree in accounting from Lehigh University and a master's degree in business administration from New York University's Stern School of Business. Visit orbcomm.com.

► ACI Foundation Announces New Leadership for Concrete Research & Scholarship Councils



Aleksandra Radlińska



Scott Anderson

The ACI Foundation, a not-for-profit organization established by the American Concrete Institute (ACI), has elected Aleksandra Radlińska, Ph.D., as chair of the foundation's Concrete Research Council, and Scott Anderson, PE, as chair of the Scholarship Council. The Concrete Research Council seeks to advance the concrete industry through the funding of multiple concrete research

projects annually that further the knowledge and sustainability of concrete materials, construction and structures. The Scholarship Council awards more than \$100,000 in fellowships and scholarships annually in the name of individuals, organizations, corporations and ACI. Anderson is president of Northern California at Pankow, where he has worked for the last 23 years in several capacities. He holds a bachelor's degree in civil engineering and mathematics from the University of Maryland and a master's degree in structural engineering from Stanford University. Radlińska joined the faculty of Penn State University in 2012, following 4 years of teaching and conducting research at Villanova University. Radlińska holds a Ph.D. in civil and environmental engineering from Purdue University. Visit acifoundation.org.

► FMI Corporation Releases 2019 M&A Report

FMI Corporation, provider of management consulting and investment banking services to engineering and construction, infrastructure and the built environment, has released its "2019 M&A Trends for Engineering and Construction" report. The results of the study indicate that M&A activity will remain strong but is likely to return to more regular levels in 2019 and beyond. Some of the report's key findings include: Nearly 60% of all respondents indicated acquisitions were a part of their current strategy; over 75% of respondents believe that industry valuations have risen over the past 24 months, primarily due to the increase in market activity; 61% of respondents said that one of their competitors had been acquired in the past three years; 66% of respondents said that one of their competitors had made an acquisition in the past three years; 46% of respondents

have contemplated acquiring a technological solution or commercializing an in-house solution. Visit fminet.com.

► Meritor Inc. to Acquire AxleTech

Meritor Inc. has entered an agreement with an affiliate of The Carlyle Group, a global investment firm, under which Meritor will acquire AxleTech for approximately \$175 million in cash, adjusted for changes in working capital at closing and subject to regulatory approvals and customary closing conditions. The addition of AxleTech enhances Meritor's growth platform, bringing a complementary global product portfolio across the off-highway, defense, specialty and aftermarket segments. AxleTech's offerings include a full product line of independent suspensions, axles, braking solutions and drivetrain components. Headquartered in Troy, Michigan, AxleTech is a privately held technology company that designs, engineers, manufactures, sells and services drivetrain systems and components, with a focus on off-highway applications. Visit meritor.com.

► Generac Holdings Inc. Acquires Pika Energy Inc.

Generac Holdings Inc., designer and manufacturer of residential, commercial and industrial power products, has acquired Pika Energy Inc., manufacturer of innovative battery storage technologies that capture and store solar or grid power for homeowners and businesses. "Pika's integrated battery storage solutions are a crucial component in developing a comprehensive system to store and consume clean energy," said Aaron Jagdfeld, Generac president and CEO. "The ideas and technology that Pika has developed give us a considerable edge as we expand into the rapidly developing market for energy storage."

Pika develops advanced power electronics, software and controls for smart energy storage and management. The company is located in Westbrook, Maine, and was founded in 2010. According to Jagdfeld, "By combining Generac's expertise in power products, Neurio's unprecedented insight into home energy use, and Pika's expertise in battery storage, we can bring

the stimulus from tax cuts to both consumers and business is fading," Hazelton said. "In the U.S., not one state has a decline in construction, general tool or party and event rental revenue and there are no signs of recession. However, weakness in core markets suggest that any forecast risk is on the downside, and our forecast has evolved lower over the past 6 months,"

and technology solutions for automation and interoperability. Torpy holds a bachelor's degree in mining and mineral engineering from Montana Tech. He also graduated from the TIO International Executive Program at the Stockholm School of Economics in Stockholm, Sweden, where the Epiroc global headquarters is located. Visit epiroc.us.

**\$33.5
MILLION**

The United States Department of Energy has announced up to \$33.5 million in funding for early-stage research and development of advanced building construction techniques to reduce energy bills. The "Advanced Building Construction with Energy-Efficient Technologies & Practices Funding Opportunity Announcement" aims to develop deep energy retrofit and new construction technologies that tackle a combination of envelope, heating, cooling, water heating and ventilation issues. Visit eere-exchange.energy.gov.

to market the first truly intelligent home energy management system." Terms of the deal were not disclosed. Visit generac.com.

► American Rental Association Forecasts Steady Growth

The new 5-year forecast from the American Rental Association (ARA) calls for equipment and event rental revenues in North America to surpass \$61.3 billion in 2019, including \$55.8 billion in the United States and \$5.3 billion in Canada, up 5% compared to 2018. Similar steady growth is expected in each of the successive years of the forecast (up to 2022). Scott Hazelton, managing director, IHS Markit, the forecasting firm that compiles data and analysis for the ARA Rentalytics subscription service as part of a partnership with ARA, says the trend for the equipment and event rental industry is slightly slower growth than previously forecast, but that growth is steady. "The outlook for the equipment rental industry calls for expected growth, although at reduced rates. The maturing economy, combined with trade issues, offers more limited opportunities to the construction and manufacturing sectors, while

he said. "There also is potential upside from an infrastructure bill. The exact gain to rental would depend upon the size, time span and composition, such as transportation versus technology infrastructure, of the bill, but something on the scale proposed by the president and Congress last week has the potential to boost equipment rental revenue by up to 10% from its baseline," he said. Visit ararental.org.

► Epiroc U.S.A. LLC Appoints Jon Torpy as New General Manager



Jon Torpy

Epiroc, productivity partner for the mining and infrastructure industries, has appointed Jon Torpy as general manager and president for Epiroc U.S.A. LLC. Torpy brings 15 years of broad leadership experience with Epiroc and predecessor, Atlas Copco, and 20 years of overall industry experience. Torpy will lead the U.S. customer center of Epiroc, which supplies innovative, safe and sustainable drill rigs, rock excavation and construction equipment and tools. The company also provides service

► U.S. DOL Announces \$10.5M in Worker Safety & Health Training Grants

The U.S. Department of Labor's (DOL) Occupational Safety and Health Administration (OSHA) has announced the availability of \$10.5 million in Susan Harwood Training Grants for nonprofit organizations, including community and faith-based organizations, employer associations, labor unions, joint labor/management associations, Indian tribes, and colleges and universities. The Harwood Training Grant program supports in-person, hands-on training for workers and employers in small businesses; industries with high injury, illness and fatality rates; and vulnerable workers, who are underserved, have limited English proficiency or are temporary workers. The grants will fund training and education to help workers and employers identify and prevent workplace safety and health hazards. Grants are available for topic training, educational materials development and capacity building. Visit grants.gov and osha.gov.

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What about your business keeps you awake at night?

Our industry experts share their solutions to some of the biggest problems facing construction business owners & their teams.

How has the gig economy affected the construction industry?



GREG BARNETT, Ph.D.

Senior Vice President

The Predictive Index

Potential Benefits:

1. With gig hiring, companies are able to **run leaner operations** (i.e., a smaller core) and hire when there is demand. This can save significant money and allow companies to bid on many more projects because they do not have to consider labor resource constraints that could prevent them from doing the work.
2. Gig-based hiring **can remove much of the talent-management overhead**, including recruitment costs and time, human resources processes, paying benefits and salaries, and even performance reviews. If someone doesn't work well or doesn't fit, not hiring them back is the ultimate performance review.
3. Gig hiring **opens up the potential talent pool**. Most research shows that gig hiring is more attractive to millennials because they're afforded increased work flexibility and mobility. Additionally, it is appealing to highly skilled laborers who are seeking more work variety or control over their lives.

Potential Downsides:

1. Gig workers may not be as motivated or engaged as nongig workers because they are completing a specific job, not serving as part of a broader company mission. **Employee engagement is important to productivity, so it is important to find ways to keep gig workers motivated.**
2. A less rigorous hiring process, focused only on skills, could lead to finding a bunch of skilled but underperforming employees. **Companies should still vet gig workers aggressively, using assessments, interviews and other tools.**
3. Finding the best talent may cost more money. Because gig workers are open to the highest bidder, they have more negotiating power, especially when they know that companies have a specific and immediate need.



NICK BARDALL

Co-Founder & Owner
Stout Conveyors LLC

The nature of a gig, and the expectation of the freelance professional, is finite, project-based work. This relationship works for us because **gig workers' desire for and expectation of short-term engagements aligns with our efforts to grow sustainably.**

As a new company entering the market, with only projected cash flow, the gig economy has afforded Stout the ability to use professional resources as we need them. The partnership is mutual. If we cannot promise a full-time package plus benefits, then we will promise one project.

In addition, it is costly to hire the wrong people. In an indirect way, **the gig economy enables start-up businesses to hire the right people, for the right reasons, at the right time**—and not out of necessity. And people are ultimately our greatest investment.

To submit your question, email Associate Editor Rachel Fulford at rfulford@cahabamedia.com.

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Show Me the Money

A look at the financial missteps keeping your profit down



GEORGE HEDLEY, CSP, CPBC, is a professional construction BIZCOACH and industry speaker. He helps contractors build management teams and get their businesses to work for them. He is the best-selling author of "Get Your Construction Business To Always Make A Profit!" available on amazon.com. Email George at gh@hardhatpresentations.com to sign up for his free e-newsletter, start a BIZCOACH program, attend a 2-day BIZ-BUILDER Boot Camp or get a discount at hardhatbizschool.com online university for contractors. Visit hardhatpresentations.com for more information.

Ask George

To submit a question for George Hedley, email Editor Kathy Wells at kwells@cahabamedia.com.

Many contractors struggle with their finances, simply because they fail to study the numbers and are unaware of their true financial situation. Often, it isn't until after a project is completed that such contractors learn of their financial condition.

Among the majority of construction business owners, one common financial misstep is not tracking and understanding how estimates and bids compare with final job costs. Many don't know their current overhead or profit markup, and worse, they guess what each should be.

WHERE'S THE MONEY?

As a business coach, one of the first things I review is my client's profit and loss (P&L) statement. A P&L statement is a scorecard of your performance as a business owner. After review of P&L statements, almost without exception, I observe that invoices and job costs are not tracked correctly or charged to the right codes or accounts (i.e., the way they bid and estimate projects doesn't match how the projects are job costed.)

A recent client's year-end P&L statement showed an annual overhead markup of 10% and a net-profit markup of 5%. When asked what markup he typically uses on bids, he replied, "We always use 20% total markup for overhead and profit."

But, if that was the case, why wasn't he wasn't making 10% net profit markup instead of the 5% showing on his P&L

statement? The client told me he was happy with the 5% net profit, even though he bid to make 10%. "Really?" I asked. "You're happy losing 5% somewhere in the process?"

He wasn't sure where the 5% profit shrinkage went, but he thought his estimated cost was likely not exhaustive. After a deeper dig, I discovered he was correct—the lost 5% could be accounted for in the items he forgot or didn't include in his estimates, including equipment, fuel, permits, delivery charges, overtime, call-backs and supervision. All of these items were paid from the overhead account and, therefore, weren't charged to the appropriate jobs.

DISCOVERING YOUR COMPANY'S FINANCIAL ISSUES

It requires a massive amount of effort to correctly estimate, bid on and be awarded a project. If you have good accounting software and staff who understand the importance of knowing and tracking the numbers, managing your finances only takes a few concentrated hours per week.

But before you can correct your financial missteps, you and your managers must make it a priority to get the numbers right. Which of these financial issues—accounting problems, estimating errors or job-costing mistakes—do you have?

- Not matching bid estimates to accounting charges for every job on your P&L statement

- Paying invoices, payroll and job costs to the wrong accounts or under the wrong county or state codes
- Not matching estimates to project budgets or accounting systems
- Padding bid estimates to cover things not included but not looked into
- Using labor rates in bid estimates that are not the actual costs required to cover taxes, health insurance, liability and workers' compensation insurance, paid vacation, holidays, bonus pay, pension and profit-sharing contributions, downtime or shop time when there's no work
- Not including extra time in labor-hour estimates to cover overtime, weather delays, call-backs, punch-list work or extra move-ins
- Not including costs for company-owned trucks and equipment in bid estimates and, subsequently, not charging for any equipment, making overhead absorb the cost
- Not taking into account costs for small tools, cellphones, tablets, trucks, fuel, mobilization, safety equipment and training time in your bid estimate
- Bidding general conditions, project management and supervision as a percentage add-on to estimates and bids versus calculating the estimated actual cost per job
- Charging too little for change orders, costs, and labor and equipment rates
- Charging the same overhead and profit markup on every job
- Not using markup percentages that cover annual overhead expenses in full
- Not knowing your annual profit goal's necessary percentage markup

USING VARIABLE MARKUP DISTRIBUTION

To maximize your markup, use the list above to acknowledge the top financial

issues you need to fix. If you aren't sure of your financial condition, ask for help from a mentor or meet with your accountant. Remember: Your goal is to make money. And making money starts with knowing and tracking your numbers, as well as using accurate job costs to bid and calculate costs.

Your bids must match the way you job cost and line up with the way your income statement is laid out and presented. And you, before the accounting manager, must know and are responsible for accurate numbers that generate profit.

Next, take a hard look at how you mark up project labor, materials and subcontractors. You can use the same markup for every job, or you can use a better strategy, one which uses different markups based on job size.

As you know, your competition tends to reduce total markup to win bigger contracts. And larger jobs attract larger competitors to bid against. The larger the contractor, the smaller the overhead percentage generally gets, as job size and volume increases. The typical annual overhead markup for a \$5 million to \$10 million contractor runs from 15% to 20%,

and sometimes more. The typical annual overhead markup for a \$25 million to \$35 million contractor is only 8% to 10%. Don't fall into the trap of thinking these are the numbers for success simply because they are the norm. As jobs get smaller and smaller, your markup will increase to handle all the time, effort, supervision and overhead that small jobs require in comparison with larger projects.

As jobs get larger, your overhead will become a smaller percentage of your total job cost, and you'll likely need to reduce your total markup to be competitive with larger contractors on bigger work.

The key is to balance sales with the anticipated number of smaller and larger projects using a job-size markup distribution plan. As you reduce markup on bigger jobs, make sure to increase markup on smaller projects to generate the total sales required to meet your annual overhead and profit goal.

Caution: When using this strategy, don't be tempted to go out and win lots of big jobs at a lower markup—you may end up busy and broke. And do not use these examples to determine your business's unique markup needs. **CBO**



Everything I Learned About Business from 'The Office'

Best-in-class strategies from a worst-in-class manager



GREGG M. SCHOPPMAN

is a consultant with FMI Corporation, management consultants and investment bankers for the construction industry. Schoppman specializes in the areas of productivity and project management. He also leads FMI's project management consulting practice. Prior to joining FMI, Schoppman served as a senior project manager for a general contracting firm in central Florida. He has completed complex construction projects in the medical, pharmaceutical, office, heavy civil, industrial, manufacturing and multifamily markets. He holds a bachelor's degree and master's degree in civil engineering, as well as a Master of Business Administration. Schoppman has expertise in numerous contract delivery methods, as well as knowledge of many geographical markets. Visit fminet.com or contact Schoppman by email at gschoppman@fminet.com.

Several years ago, "The Office" dominated the national comedy television spotlight with its unique "mockumentary" style filming of a small paper company in Scranton, Pennsylvania, where the naïve and not-so-politically-correct, but often kind-hearted, manager, Michael Scott, leads the team. Many of the episodes focus on the escapades of the office staff.

One of the main observations the viewer gleans from the show is Scott's inability to lead or manage, as well as his ability to achieve success, despite his vast ineptitude. However, within the show, there are several lessons any construction organization can easily apply to their business strategy.

PASSION

Dunder Mifflin, the fictitious company in the show, sells garden-variety, white copy paper—hardly a sexy premise for a television series. However, if there's one thing Scott has a passion for, it's paper. He and his trusty assistant manager, or "assistant to the regional manager," Dwight Schrute, know about paper and all of its many nuances. Nothing could be more vanilla (no pun intended).

How passionate are you about the construction

industry? How passionate is your team? Why do you do what you do? Does passion resonate throughout your organization, or do you simply go through the motions? Scott makes the most boring product tantalizing to customers and keeps his branch office alive. Does your team do the same for its clientele?

CUSTOMER SERVICE

One of the main premises for the show is the firm's ongoing battle with big-box stores and the competitive landscape causing Dunder Mifflin to have to pivot repeatedly. Scott is often the top salesperson for his firm and the city of Scranton—he can sell paper in spite of having the intellect of a ream of paper.

He knows his clients and, in countless episodes, he and Schrute can be seen interacting with clients and showcasing Dunder Mifflin's superior customer service.



Dunder Mifflin has to further amplify its customer service in the face of enormous price pressures in a hard-bid commodity industry. Sound familiar? Never confuse marketing for old-fashioned, superior customer service.

PROMOTIONS

Scott is a superior salesperson at Dunder Mifflin, even winning an award for top performance. However, he's hardly a great manager. In similar fashion, how often do firms take a great foreman or project manager and promote them to a position that is not commensurate with their skill sets? Being a great builder of structures does not always translate into being a great builder of people or business. Many firms make the mistake of promoting for one set of skills and hoping they enable that person to be successful in an entirely different environment.

Often, this is done with little guidance, training or development. Scott had no mentorship, short of his time with Jan Levinson Gould, his love interest and district manager. Keep that in mind.

RECOGNITION

On an annual basis, Scott engaged in an unsanctioned, yet well-intentioned, awards event known as the "Dundies." A Dundie award is meant to represent the equivalent of an Oscar or Emmy but has the same impact as receiving a number at the DMV. Nonetheless, Scott's passion is ever on display.

Winning a Dundie for "whitest sneakers" might not get anyone's attention in the construction industry. But, on a strategic level, when was the last time someone in your firm was recognized for doing something well or honorably? In a world rife with cynicism, in which we seem to thrive on watching someone stumble, why not showcase the

amazing things your organization and its people do?

INNOVATION

In one episode, the new regional manager launches Dunder Mifflin Infinity, the organization's strategy to combat the increased traffic to big-box stores and online retailers. Much to his chagrin, Scott bucks the trend and fights to keep the business status quo, even kidnapping a hapless pizza delivery person in the process. Scott's belief is that customer service alone will separate Dunder Mifflin from the online community. While Scott's zeal for face-to-face interactions with his customers is to be applauded, halting innovation is futile for Dunder Mifflin, just as it would be for your company.

Even so, there is no shortage of industry laggards that serve as holdouts amid the strong tailwind of innovations surging in the industry. Autonomous vehicles, augmented reality, real-time data collection/dissemination, prefabrication, modularization, robotics, 3D printing and blockchain are not only buzzwords in construction, but they also represent the future of the industry.

This is, of course, a tongue-in-cheek examination of a worst-case business management approach. The TV show's sticking power lies in the audience's ability to relate to the awkwardness and cringe-worthy performances of Michael Scott—everyone has had a manager or leader who seems to be successful in spite of themselves.

However, "The Office" also provides a moment for leaders to ask themselves questions about their own styles, approaches and strategies. The lessons are pertinent and germane yet stirring. And couldn't we all use a little stir to serve as motivation? **CBO**

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35 Years Between the Ears

Using a knowledge transfer plan to retain important data when key employees leave



DAVID SWIDER is an industry strategist at InEight. In this role, he combines his experience and strategic perspective to help clients identify areas for increased efficiencies within their organizations. Swider joined InEight in June 2012 as the western area sales manager and grew within the company to also hold the positions of general manager for North America, worldwide sales director and executive vice president of sales. Today, Swider is responsible for driving InEight's expansion in the project cost management marketplace. With more than 25 years leading the efforts of construction technology companies, Swider has a deep understanding of the strategic benefits of a truly connected project life cycle workflow, which he uses to help customers identify areas for increased operational efficiencies while minimizing risks. Swider holds a bachelor's degree in business from Catawba College. Visit ineight.com.

What would happen if your most experienced employees left your company? What would happen if the ones who were most instrumental in your organization's growth and development moved on tomorrow, no longer available to contribute their knowledge? They understand the industry, how your business operates and your pathway to success. So, what would you do if they were no longer around?

In an instant, you would lose decades of experience, problem-solving and that "secret sauce," that "been there, done that" type of knowledge, which built the foundation of your company's success.

Can you even imagine the impact of such a loss from a financial and productivity standpoint? It's a scenario that can keep any business owner up at night. Now, more than ever, it's critical for companies to find ways to capture and leverage those "years between the ears" from their most valued team members before it's too late.

The good news is that there are ways to minimize the impact of losing those who hold years of knowledge when they walk away with their retirement package.

BUILD A KNOWLEDGE LIBRARY

The first step is to immediately bridge the gap between newer, less experienced team members and your seasoned veterans before it becomes an issue. Of course, this is often easier said than done.

The key is to find a common ground by benchmarking, or creating a historical knowledge library. Whether the information is kept in gray matter or on a pallet of drawings within a railroad car storage unit full of three-ring binders, the information is yours. You've bought, paid and certainly earned it. So, start capturing the data and, more importantly, start leveraging it.

Technology is making it much easier to leverage your data. Now, you can create, build and maintain a centralized knowledge base for your projects. With the right digital tools, your newer employees can instantly reference past projects, performances and the personnel involved to draw insight from lessons learned over many years. Then, they can quickly apply that knowledge to current and upcoming projects.

This historical repository captures years of experience in a digital format that may be used again and again, even if your resident expert seeks residency elsewhere or retires. Simply put, your best practices, expertise and experience can live on for the greater good and health of your company, regardless of personnel.

GET EMPLOYEES ON BOARD

The second step is to leverage those years of experience. With a knowledge library in place, you've already given your junior team members a way to look at and learn from historical projects and similar past-work details instead of starting each

project from a clean sheet of paper, which saves time, reduces risk and improves overall outcomes.

Your knowledge library can create a collaborative way to coach new employees and avoid project pain points. Today, technology can be used to build consensus on various aspects of project planning. New and veteran workers can use technology to review plans with senior project engineers, project managers and other key stakeholders who can share their experience and expertise on risks, ideas, opportunities, issues and change requests.

The project plan you create when you build consensus across your entire team will set you up for success. More importantly, you will grow your company's experience and understanding, empowering your new and seasoned, burly-knuckled professionals (men and women alike) to continuously improve through a collaborative effort.

CONNECT WORKERS

We've examined how to help bridge the gap between your veterans and rookies. The other question now becomes, "Where does that rich information live?"

To be able to truly leverage companywide lessons learned, you need to gain control and maximize productivity over capital construction projects. When is the last time you took inventory of how many different systems are really at play within your organization?

Each of these systems holds pieces of your project's history and detailed reference information. Sure, key players may know where that vital information resides, but do all your team members know where to find it? Probably not.

More than ever, companies need cloud-based technology to instantly connect users to information, anytime and anywhere. The use of a collaborative



Your knowledge library can create a collaborative way to coach new employees & avoid project pain points.

document-management system provides companies with a searchable repository of crucial documents, drawings and communications that can be accessed instantly at their fingertips.

Imagine having an intelligently integrated, cooperative solution where you can link and create relationships between different project items, such as emails to requests for information; tasks to photos; and photos to documents. You would gain a higher degree of contextual project understanding and be able to analyze your data more completely.

You would also have easy access to data that assists in making more accurate and timely project decisions. With a document-management system, your company can keep critical information in the hands of your folks, no matter who is on staff at the time.

And your newer team members can have instant access to a data, including

information that may have been lost with your seasoned veterans when they departed. You could be able to easily coordinate and synchronize project documents and communications while making them easily accessible to anyone who needs them.

Too often, business owners fail to think about the consequences of losing strong team members until it's too late. Taking advantage of today's industry-centric technology will eliminate the loss of veteran knowledge and transform your company in a way that gives it a "no fear—we captured the years" mantra.

Once you have your knowledge library captured digitally, go ahead and wish your folks a happy and peaceful bon voyage. Meanwhile, you can rest assured with the confidence and comfort that you have accurately retained the reams of data vital to your organization's success. **CBO**

Widening the Workforce

How the 'I Build America' program brings new focus to an old industry

BY DEBORAH R. HUSO

Guilherme Alves Jr. has a serious problem. While the 47-year-old owner and operator of Lakeside Concrete Enterprise in Williamsburg, Virginia, has plenty of work (his phone rings nonstop), he can't find enough help. "The hardest part of my business is finding laborers," said Alves. "I'll get some guys who show up on the first day and quit after a few hours because it's too tough." Alves isn't alone. A 2018 industrywide survey from Autodesk and the Associated General Contractors of America (AGC) reports 80% of construction firms have a tough time hiring hourly craft positions. And this comes at a time when average earnings for construction workers are at a 9-year high, and employers filled almost 223,000 construction jobs in the past year.

So, why can't construction companies increase their workforce? It's complicated. A recent survey of 18- to 25-year-olds by the National Association of Home Builders (NAHB) revealed only 3% of young people were interested in pursuing construction as a career, with most perceiving construction as difficult and wanting a less physically demanding job.

"Nobody wants to do hard labor," said Alves. "These kids have no idea how much money they could make. It's hard to find labor unless [the workers] come from a country where there's less opportunity."



The immigrant community has long been a pillar of the construction industry. A 2017 Pew Research Center study reported that 24% of construction workers in the United States were either documented or unauthorized immigrant workers. Among workers with temporary protected status in the U.S., 23% had a construction or painting job.

But, as the White House limits immigration, it's getting harder for contractors to meet labor demands. While the obvious answer would seem to be

recruiting from the native population, the challenge lies in attracting talent from underrepresented groups in construction and changing industry perceptions.

THE BEGINNING

"I started working [as a laborer] for my dad's concrete business in the summer when I was 16," says Alves. "[My dad] helped show me the value of a dollar and sweat equity."

In the early 1990s, Alves spent most of his days working for others, lugging



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Others Paving the Way

Mike Rowe Works Foundation—Offers scholarships and works to encourage people to enter trade and construction jobs. Visit mikeroweworks.org.

Associated Builders and Contractors Chapter Programs—Trains craft and management professionals to become a safe, skilled and productive workforce. Visit workforce.abc.org.

Women in Construction—Encourages women to enter construction and shows the career benefits of trade skills. Visit procure.com/wic.

National Association of Home Builders—Connects educators, industry members and local home builder associations to help people get started on a construction career path. Visit nahb.org/en/industry-professionals/careers-in-the-trades.aspx.

250-pound slabs of concrete across construction sites in the sweltering northern Virginia heat. Eventually, he moved to greater Williamsburg, Virginia, to establish his own business.

He got his start during a period when the construction industry's employment rate was on the rise—from 1989 to 1999, employment increased by 23.8%. Today, Alves is one of the Tidewater area's most successful contractors.

SPARKING NEW INTEREST

Changing the view of trades like construction and attracting new talent take more than just a few talking points and promises of a comfortable living. That's where programs like "I Build America" come into play.

"We want to start a conversation with millennials and Generation Z that instills a sense of desire to join the construction industry," said "I Build America" Manager Susanna Jakubik. "We are first working to change their perception."

Mike Rydin, founder and chief executive officer of Heavy Construction Systems

Specialists Inc., started "I Build America" in 2016 to show young people how construction can lead to a purposeful, rewarding career. The program's mission is to show that skilled laborers are well compensated right away and contribute to meaningful projects.

These are imperative points to get across, given millennials currently earn less than their parents did at the same age, and 74% of younger job candidates want a job where they feel like their work matters. "I Build America" recruits members across a variety of construction industries, including industrial, marine, earthwork, environmental and highway, and provides them with resources to help attract younger workers.

YOUNG, DIVERSE TALENT

Finding fresh talent from underrepresented groups is critical for sustained growth in construction. Workforce management and talent optimization are two of the leading global challenges facing the industry over the next decade, according to Willis Towers Watson's 2017 study on construction risk, which also recognized the industry's limited workforce diversity.

According to the U.S. Department of Labor, the median age for an American construction worker is 42.5. Along with an aging workforce, males make up almost 90% of workers in the construction industry sector. "I Build America" provides a platform for women in construction to share their stories and serve as an inspiration to other young women.

"While there are challenges in the industry—like equipment needed for smaller hands and bodies and an unequal number of restroom facilities—the biggest benefits are opportunity and compensation," said Jakubik.

The U.S. Department of Labor reports women earn 95.7% as much as men in the same job in construction—more than the standard 81% across all other industries.

With the average hourly wage for a skilled laborer at \$21.21, the potential

for young people and women to earn the median salary (\$44,564) in the U.S. has never been higher. The onus is on the construction industry to further open its doors to a younger, diverse demographic.

FRESH OPPORTUNITIES

Some employers hear the words "millennial" or "Generation Z" and conjure stereotypes of entitled young adults who expect more than they deserve and won't break a sweat to earn a buck. As his father did, Alves plans to show his kids firsthand the value of construction and not let them fall into that pigeonhole.

"My oldest boy is 15, and he will be working for me this summer," said Alves. "I want him to learn that it's all about respect, and respect comes from hard work."

Not everyone has a relative or chance encounter that introduces them to construction as a career. That's where programs like "I Build America" step in to introduce industry leaders to previously untapped labor markets and high school students to unconsidered career paths.

"We visit schools at all levels to plant the seed at a young age about the benefits of a construction career," said Jakubik.

"I Build America" keeps an active social media presence where they share inspirational stories from their members and young people in construction. Along with offering recruiting collateral and career-day toolkits for members, the program is making great strides in showing future generations the benefits of a construction career.

"Young people are the lifeblood of the construction industry," said Jakubik. "As the existing generations retire and move on, companies need to attract and retain top talent to fill their spots." **CBO**

Deborah R. Huso is founding partner of Write Well Media LLC, a content-marketing and strategic-communications firm focused on the construction, design and real estate industries. Huso has been writing on industry trends for more than 20 years.

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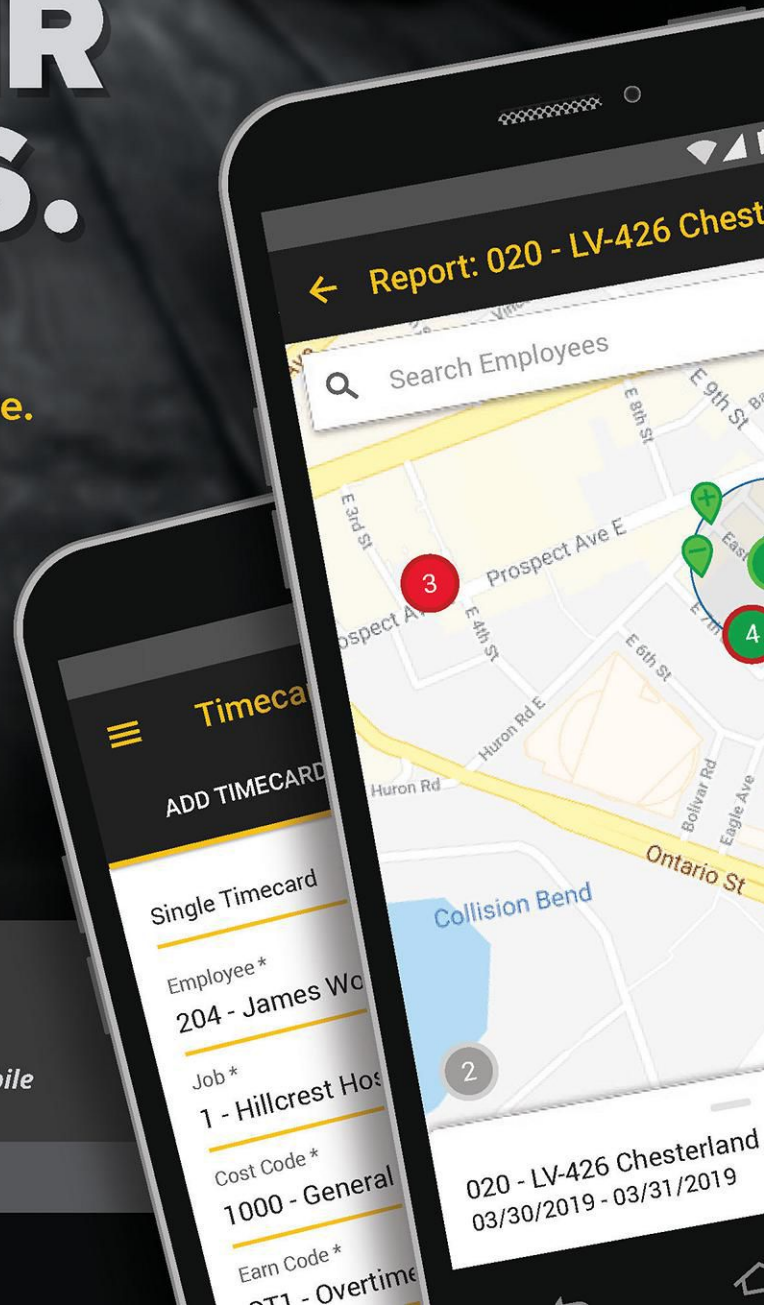
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Do You Say the 'S' Word at Work?

10 simple steps to overcome stigma & implement a suicide-prevention program

BY CAL BEYER

The suicide-prevention movement continues to spread like wildfire throughout the construction industry. It seems like there is a news story with an updated statistic almost weekly. Articles are published regularly, and industry associations are sharing these and other resources with their members. Yet, it seems that only the surface has been scratched. The fact remains—the construction workforce remains at risk of suicide due to risk factors unique to construction and its demographics.

According to the Centers for Disease Control and Prevention (CDC), construction workers remain four times more likely to die by suicide than the population at large—a rate equal to 53.2 per 100,000 workers. Male-dominated industries are most vulnerable, and especially so in a masculine, macho, tough-guy culture like construction.

The already deeply rooted culture of alcohol and substance use became more problematic with the emergence of the opioid epidemic. In addition, the construction industry has the highest use of prescription opioids due to chronic pain from occupational injuries.

DON'T IGNORE THE 'S' WORD

Suicide is a personal issue, a family issue, a community issue and a societal issue.



So, why isn't it a workplace issue? For years, there was no mention of suicide in the workplace. In fact, the "s" word was considered too private and sensitive to talk about on the job. Yet, over 200 million workdays are lost annually due to mental illness. One in five Americans experience a diagnosable mental illness during their lifetime. Anxiety and depression are the two most common.

Again, this begs the question: Why has it been taboo to talk directly about mental health and suicide? The biggest obstacle

is the stigma associated with talking about mental health, suicide and substance use, which results in workers and their family members suffering alone, in silence and, often, shame. Breaking this stigma is the key to unlocking help that can lead to hope, recovery and rehabilitation.

IMPLEMENT SAFETY, HEALTH & WELLNESS PROGRAMS

The question remains a personal one for construction company executives and leaders: What has your company done to

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address suicide prevention? In fact, this question needs to be even more specific and inwardly focused. (i.e., What have you done to address suicide prevention in your workplace?) Bold leadership is required of construction owners and executives to decide to address suicide prevention as a workplace issue, and addressing mental health and suicide prevention is an emerging leadership competency.

Leaders in high-risk industries, such as construction, can no longer ignore the reality of distress among employees and their families. Action is required to help bring awareness, advocacy and accountability to address organizational gaps in knowledge, available resources and support for at-risk employees. The following 10 steps help provide focus to a construction leader who wishes to proactively address this topic:

1. Resolve to stop thinking about this topic and instead commit to tackle it in your company by discussing it with your leadership team.
2. Educate yourself and your leadership team on mental health issues, suicide prevention and addiction recovery.
3. Understand the behavioral health services available in your health plan. Your health benefits broker can provide you with additional information. If you're a union contractor, check to see what benefits are available through the union health plan. Then, share this information with new hires, at health fairs and during open enrollment.
4. Verify the resources available through your company's employee assistance program (EAP). Ensure the available employee or union health benefits and referrals are considered in-network under your health benefits plan.
5. Identify local mental health and suicide-prevention organizations in your community available to offer training and provide resources, such as the American Foundation for Suicide Prevention (AFSP) and the National

Alliance on Mental Illness (NAMI).

6. Display suicide-prevention posters in the areas where employees assemble. The Construction Industry Alliance for Suicide Prevention offers downloadable posters at preventconstructionsuicide.com that are helpful in setting the tone.
7. Conduct a companywide safety stand-down, or time set apart for, talking about a respectful workplace and the need for sensitivity and acceptance of others. Specifically, mention that construction is a high-risk industry for mental illness, suicide and addiction and that resources are available. Talk about the steps you and your company are taking to make your workplace a safe zone and the mental health and suicide prevention resources available.
8. Distribute refrigerator magnets with the company's EAP or the union's behavioral health contact information. Another way to reach employees is to distribute wallet cards for sharing with their spouses and children that lists numbers to call with resources like the Crisis Text Line or the National Suicide Prevention Lifeline.
9. Incorporate discussions about mental health, suicide prevention and addiction into your company's new-hire orientation process and checklist. This is a good time to provide samples of two separate wallet cards.
10. Request that supervisors conduct periodic toolbox talks on the topics of mental health, suicide prevention and addiction recovery.

Today's construction business owners and leaders face the growing challenge of workers at risk of mental illness, suicide and/or addiction. And these problems are often comorbid. It is imperative for owners and leaders to understand the risk and take action to create awareness and advocacy within their organizations. It is no longer acceptable to ignore this reality.

Additional Resources

- **American Foundation for Suicide Prevention (afsp.org)**—State-specific suicide statistics, state chapter contact information for bereavement care packages and for requesting training resources
- **Construction Industry Alliance for Suicide Prevention (preventconstructionsuicide.com)**—Links to articles, whitepapers, needs-assessment checklists, downloadable posters, tools and other resources
- **Living Works Education USA (livingworks.net)**—Provider of various training programs ranging from 90 minutes to 2 days in length, focused on suicide prevention
- **National Alliance on Mental Illness (nami.org)**—Library of facts sheets and infographics; state chapter contacts and a listing of training programs
- **Substance Abuse Mental Health Services Administration (store.samhsa.gov)**—Directory of publications and digital resources

Become knowledgeable and equipped to address the issues and challenges posed by the threat of mental illness and addiction.

Become better prepared and share resources for employees and their families. This will demonstrate that your people really are the most valuable asset in your company. **CBO**

Cal Beyer has been the director of risk management at Lakeside Industries since 2014. Beyer has over 30 years of professional experience in safety and risk management serving the construction industry. He serves on the Washington State Action Alliance for Suicide Prevention, the Safer Homes Suicide Aware Task Force and the executive committee of the National Action Alliance for Suicide Prevention. Beyer has been a member of the Construction Business Owner Editorial Advisory Board since 2016. Contact Beyer at 425-313-2611 or cal.beyer@lakesideindustries.com.





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The Jobsite's Invisible Injury

How to protect your workforce against noise-induced hearing loss

BY STEVE OCHS

According to the Occupational Safety and Health Administration (OSHA), in 2017, employers were required to pay more than \$1.5 million in penalties for not adequately protecting workers from noise exposure; an estimated \$242 million is spent annually on workers' compensation for hearing loss disability; and noise-induced hearing loss (NIHL) affects nearly one in four adults in the United States. NIHL is preventable, but the effect is permanent and can seriously impair a worker's quality of life.

Thousands of construction workers suffer hearing loss from excessive noise exposure on the job every year. According to a study spanning a decade of research by CPWR – The Center for Construction Research and Training, construction accounted for the second-highest prevalence of workers with a hearing impairment, with at least one in five reporting hearing trouble.

Despite having the duty of protecting employees from workplace hazards that can cause injury or illness, industry employers have no obligation to test workers' hearing via audiometric testing, even if noise exposure levels exceed OSHA's permissible exposure limit (PEL). For this reason, hearing loss is rarely recognized as an "occupational disease" in construction. As such, the Bureau of



Labor Statistics (BLS) states that hearing loss is underreported, making hearing loss data for the construction sector unable to be compared with data for general industry. However, the repercussions for the employer who does not seriously consider the auditory welfare of their workforce can be significant, leading to huge payouts in compensation benefits to employees. Measuring jobsite noise exposure levels provides concrete data and pinpoints avenues for improving noisy working conditions.

NOISE MONITORING

OSHA sets the legal limits on noise exposure in the workplace based on a worker's time-weighted average over an 8-hour day. The maximum permissible exposure limit to noise is 90 decibels during the 8-hour day, minimizing the risk of occupational NIHL.

Conversely, the National Institute for Occupational Safety and Health (NIOSH) recommends that all worker exposure to noise should be controlled below or equivalent to the level of 85 decibels for 8



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hours. Although NIOSH recommendations are designed to represent a best scientific practice concerning noise exposure, OSHA's exposure limit is regulatory and is the law that must be complied with.

OSHA standards specify a maximum allowable daily noise dose, expressed in percentages. (i.e., A person exposed to 90 decibels over an 8-hour work shift, will reach 100% of their daily noise dose.) The noise dose is based on both the sound exposure level and sound duration. For each increase of 5 decibels in noise levels, the amount of time the worker is exposed should be cut in half. By contrast, NIOSH recommends a 3-decibel exchange rate that results in shorter allowable exposures at higher noise levels. See Figure 1 for an example chart of the two in comparison.

In 1981, OSHA introduced a regulation requiring employers to implement a hearing conservation program for workers exposed to an average noise level of 85 decibels or higher during an 8-hour shift. Hearing conservation programs require employers to measure noise levels and provide free annual hearing exams, hearing protection and training. Employers must also conduct evaluations of the adequacy of the hearing protectors in use, unless the employer makes sufficient changes to tools, equipment and schedules that result in the lessening of worker noise exposure to less than the recommended 85 decibels.

When working to ensure adherence to OSHA regulations on your jobsites, noise level monitoring provides accurate insight into the workers' environment, identifying where the problem areas are. And doing so through the use of external resources keeps company time and cost burdens low. If you are keen to train your workforce, there are many devices on the market, but it can be difficult to identify what type of product is most suitable for your working environment and where training is required. A successful noise monitoring program can be carried out on-site by

Time to Reach 100% dose rate	OSHA PEL (5 decibel exchange rate)	NIOSH REL (3 decibel exchange rate)
8 hours	90 decibels	85 decibels
4 hours	95 decibels	88 decibels
2 hours	100 decibels	91 decibels
1 hour	105 decibels	94 decibels
30 minutes	110 decibels	97 decibels
15 minutes	115 decibels	100 decibels

Figure 1. Maximum allowable daily noise dose

trained health and safety managers, using either a sound-level meter or a dosimeter.

SOUND-LEVEL METERS & DOSIMETERS

A sound-level meter is a hand-held device that enables measurements to be taken at the ear with the instrument pointed toward the noise source. This process must be repeated for both ears, for each duty employees perform, which makes it possible to calculate an accurate record of daily exposure. Settings on these meters can be adjusted according to the type of noise being assessed. Monitors should be calibrated to the ANSI S1.4 standard.

When using a sound-level meter, measurements must be started at the beginning of a task, representing workers' actual exposure. If workers are likely to be exposed to high levels of impulse noise, emitted from heavy pressing operations or sheet metal working, peak noises must be measured for accurate results and compared to peak action levels.

If individual working patterns are irregular, if the worker is highly mobile, or if the type of work being carried out means it is not practical or safe to conduct noise monitoring with a sound-level meter, noise dosimeters can be used. These are small shoulder-worn devices that will collect individual exposure data.

Dosimeters are worn by employees for their entire working shift. Data is instantly logged and, when downloaded onto another device, details the time history of the noise exposure, highlighting where spikes in exposure occur throughout the

day. Workers can also make a diary of times and jobs performed, allowing the employer to instantly see the operations that require more effective noise controls.

It is important to remember that noise dosimeter measurements may be subject to spurious results from employees, especially when first used. High exposures or spikes in the dataset should be checked to see if they are a legitimate part of the worker's exposure. Modern noise dosimeters can also record the actual audio, which allows the sound to be played back to determine the source.

Worker exposure to potentially damaging noise at work is concerning. What's equally concerning is some employers' disregard of NIHL as a legitimate occupational issue, particularly in construction where it poses a major risk. Employers have a crucial responsibility to protect worker health and to upskill their workforce so that employees realize the implications of damaging noise exposure.

Monitoring solutions, like hand-held sound-level meters and noise dosimeters, are an ideal solution for you and your organization to achieve compliance with government standards while effectively and demonstrably protecting your workforce. **CBO**

Steve Ochs is Casella's area business manager, supporting Casella's health, safety and environmental boundary-monitoring solutions. Visit casellasolutions.com.



HOW TECHNOLOGY HAS TRANSFORMED THE ROLE OF THE PM

Creating project efficiencies
& providing long-term solutions



June 27, 2019 | 2 p.m. EDT

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Your technology should work just as hard as you do. Listen as Keidel shares how technology gives him a competitive edge by keeping teams on the same page, creating seamless processes, and maintaining accurate information. Join us to hear firsthand stories and strategies around the challenges PMs face and the right technology solutions for any-size project and team.

SPEAKER

Andy Keidel
Project Manager
**Fogel-Anderson
Construction Co.**



With over a decade of experience in the industry, Andy Keidel has worked in many roles, including site superintendent, business development, accounting liaison, onboarding new talent, implementing software, creating reports and developing and improving processes. Keidel has worked as a specialty subcontractor and a commercial general contractor, building a variety of projects, ranging from about \$5 million to \$200 million. He holds a degree in construction management from Pittsburg State University.

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ACCOUNTING: Exploring the Earnings Gap | By Steve Coughran

CONSTRUCTION'S ECONOMIC PROFIT CURVE

& WHY YOU SHOULD CARE

In recent decades, headlines about “the rich getting richer” have cluttered top media outlets. While the nation has heartily consumed stories of income inequality, few are informed about the primary engine of this disparity—the stark earnings gap amid corporations. An economic partition separates top earners from lagging organizations, creating a distinct fissure between the haves and have-nots.

According to Nicholas Bloom’s Harvard Business Review article, “Corporations in the Age of Inequality,” a slim percentage of top-earning companies actually earn significantly more profit than their rivals in what’s been deemed the “winner-takes-most” economy. This enables these winners to pay more for sought-after skill sets and top-tier workers (fueling an income gap) and, therefore, leverage high-caliber talent to continuously outperform and outearn within the market.

In Fortune’s annual list of the United States’ 10 most profitable companies, seven of the 10 remained on the list from 2016 to 2017. (Apple has been the country’s most profitable company since 2015.) It’s a virtuous cycle, wherein profit leads to profit, and industry leaders pile on to their successes. The companies at the top are not only staying at the top; through continued improvements, they are elevating the boundaries of the top tier. As leading companies earn more, there is less profit remaining for lagging companies, only widening the gap.

To demonstrate the divide in the construction industry, I partnered with the Construction Financial Management Association (CFMA) and Coltivar Group to analyze a representative sample of 363 industrial and nonresidential U.S. construction companies ranging from \$1 million to over \$1 billion in revenue. I measured economic profit, net income and less-weighted average cost of capital x invested capital (i.e., net property, plant, equipment plus working capital), as an objective lens to compare the companies.

While accounting profit is referred to as earnings before interest, depreciation, taxes and amortization (EBIDTA), net operating profit after taxes (NOPAT), or net income, is often companies’ default metric due to its familiarity and simplicity. However, this metric does not represent the flow of money. Accounting methodologies surrounding depreciation, amortization, impairment, provisions, valuation and accruals can mask the true economic performance of a company. Economic profit, on the other hand, acknowledges the opportunity costs of making tradeoffs by measuring net operating profit (less taxes) after subtracting the cost of capital. Therefore, it provides a more impartial view of financial performance.

After computing the economic profit earned by each firm, I segmented the results into deciles (e.g., bottom 10%, illustrated in Figure 1). While 50% of companies

had a competitive advantage, defined as the ability to earn above-industry-average economic profits, the calculation revealed that companies in the 10th decile, or top 10%, earn 64% of all economic profit. And the top 20% earn nearly 83% of all economic profit, fulfilling the Pareto principle, or the 80/20 rule: The remaining 80% of companies (even those that technically earn a competitive advantage) are confined to the dog-eat-dog environment of the lower deciles, where they contend for leftover scraps of industry profit.

What determines this inequitable distribution of economic profit? How did these successful contractors achieve the initial success to advance up the curve? Though many assume that greater capital and resources automatically funnel into economic profit, a company's size is a negligible determinant of decile.

In fact, 51.4% of contractors in deciles nine and 10 earn less than \$100 million per year, and only 23.6% earn \$500 million or more in revenue. As such, smaller contractors are earning a coveted position on the economic profit curve next to larger rivals. Growing the top line in the short term does not necessarily result in margin improvement over the long term; the differentiator must be strategy.

The book "Outsizing: Strategies to Grow Your Business, Profits, and Potential" defines how great companies design and implement strategies that propel them along the economic profit curve. While the top 20% of companies are capturing most of the profit, interviews and surveys of thousands of executives and employees revealed merely 10% of respondents reported being highly satisfied with their strategies. Once companies leverage robust strategy design and execution to truly tap into their potential, they can make incremental improvements and bold moves, advancing along the profit curve.

1. BUILD FROM ADVANTAGES

To create a powerful strategy, companies must first understand customers' unique values and capitalize on inherent positional, asset and capability advantages to better serve them. Take for example, the patent, one of the most common and powerful asset advantages. Research has shown that "the industries that have sustained the highest average returns are those that 'rely on sustainable competitive advantages, such as patents,'" according to "Even for Companies, the U.S. Is Split Between Haves and Have-Nots," by Sam Wilkin, Harvard Business Review.

In "Drug Companies Have Big R&D Expenses and Still Make Large Profits," featured in Fortune magazine, Erik Sherman says that though they bring in only 23% of the revenue, pharmaceutical companies earn 63% of the U.S. health care industry's profits. "Big pharma" has devised solutions to customers' health needs and protected these investments by investing in lucrative drug patents.

In other industries, companies may drive profit through positional advantages. For instance, Walmart touted a 2018 gross profit margin of nearly 25%, according to Statista. The megabrand has defined itself as the low-cost leader. By predominantly establishing a presence in rural and suburban areas, the retailer operates with "2.5 times as much selling space per inhabitant in the poorest one-third of states as in the richest one-third," said Kyle Emory, in "Walmart's Rural Dominance: A Brick & Mortar Advantage in an eCommerce Battle." The company has minimized its property prices through the establishment of low-frills stores in inexpensive areas, allowing it to squeeze out an additional cost advantage over competitors.

Other companies capitalize on unique capabilities, bundling

individual skill sets, managerial techniques, company culture, team ability and expertise to execute. Some companies drive cost reduction through the corporate capability of efficiency.

Through building information modeling (BIM), project management software and automation, construction companies digitize their processes to cut costs. Once a company determines its advantages, whether it be assets, industry position or capability, they are better equipped to pursue investments, allocate resources and make strategic decisions that result in value capture.

2. UNDERSTAND KEY FINANCIAL LEVERS

When magnified, each of the economic profit deciles slope slightly up and to the right. Therefore, companies must design strategies to drive incremental improvements that enable them to overcome the gravity of their deciles. Over the past 2 decades of working

Economic Profit in Deciles

Industrial & Nonresidential Construction, United States, 2018

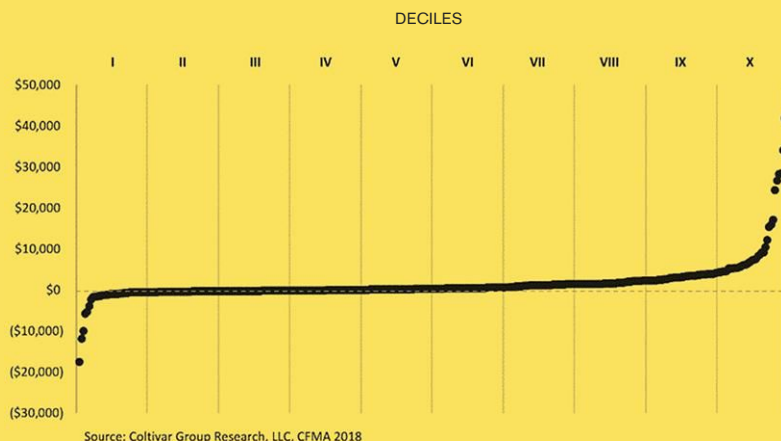


Figure 1. Top-performing companies earn economic profits disproportionate to average- and low-performing organizations. Economic profit follows the Pareto principle, commonly referred to as the 80/20 rule, which states that 80% of the outcomes are produced by 20% of the causes.

at companies in a variety of industries, I have witnessed financial misunderstanding and misinterpretation as a slipping point for organizations that tilt to the left side of the decile. Financials are often obscured by leaders' struggles to discern the story behind the numbers. They mistake profit for cash and run out of fuel for the business. They ignore throughput, leverage inaccurate forecasting to navigate decisions, and/or fail to tie their metrics to strategy.

Driving economic profit requires companies to understand what profit truly is. Companies must know the levers that they can pull to achieve results. Financials reveal insight into strategic operations, indicating areas of strength and weakness and guiding company focus and procession. Business is a machine impacted by every individual. A strong base of organization-wide financial knowledge is the start to growing the bottom line.

3. BUILD MECHANISMS TO EXECUTE

Finally, high-performing organizations instill discipline into their cultures. Creating and acting on an outsized strategy requires significant effort. However, design and implementation are facilitated by making strategy habitual. While mission, vision and values may point companies in the right strategic direction, efficacy is achieved through consistency and cumulative improvement. Contractors

in the top deciles create initiatives, actions and results by defining their overarching objectives, distinct activities to achieve them and the metrics to track their progress toward key goals. They forge accountability. These contractors don't grow profit by making it the focus of their strategy. Rather, their spot on the curve is a testament to their unique, customer-centric advantages; their financial prowess; and a firm commitment to their strategies.

By intelligently leveraging advantages and financial information, firms can make great strides to advance along construction's economic profit curve within a given decile. Whether a company is operating on the left or right end of the curve, the focus should be on winning within their decile, earning their fair share of economic profit and steadily advancing up the profit ladder. **CBO**

Steve Coughran, CPA, is chief financial officer of the international construction company EMJ Corporation and is a management consultant. Coughran has launched and managed three cross-industry companies and has developed and led programs, such as the Strategic Financial Leadership Academy and the "Growth-Driven Leadership and a Strategic Financial Leadership" course at the University of Denver. Coughran holds a master's degree in business administration from the Fuqua School of Business at Duke University. His book, "Outsizing: Strategies to Grow Your Business, Profits and Potential" is available at Amazon.com and major bookstores. Visit stevecoughran.com.



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COMBINING FIELD TRACKING & ACCOUNTING SYSTEMS FOR BETTER PROJECT OUTCOMES

Heavy construction is catching up to other sectors when it comes to deploying software, which is prompting contractors to closely examine the roles and integration of software solutions for field operations (where profits are made) and accounting (where profits are measured).

Disparate point solutions for various operational and accounting workflows have made many companies painfully aware of the inefficiency, errors and frustration involved with trying to connect those systems. An integrated alternative from a single supplier has appeal, especially when it promises to encompass accounting and operational requirements.

That promise of one-stop shopping, however, has proven to be difficult for software suppliers to fulfill, leaving many contractors struggling to gain acceptance and get the results they need in the field. The reason? These systems are designed, essentially, with accounting logic and for accounting priorities.

BRUBACHER EXCAVATING

Between managing fragmented applications and shooting for the elusive single solution, a more effective model is emerging.

“Today, we’re really centered around two major software tools, one for accounting and one for the bidding and operational aspects of our business,” said Keith Brubacher, president of Brubacher Excavating, a site-construction specialist headquartered in Pennsylvania.

The logic at Brubacher is one shared by many contractors: Construction accounting platforms are powerful and essential but are not ideal for the real-time data capture, specialized reporting and ease-of-use needed for agile, effective field-performance tracking.

MORTENSON CONSTRUCTION

Eric Sellman, a vice president and general manager at Mortenson Construction, assembled a multidisciplinary team to replace paper and establish a standardized electronic field-tracking system for the company’s nationwide civil division.

Eliminating the redundant, inefficient work of gathering time

cards and production data was a primary goal, as was providing project leaders with daily job-cost and productivity information to make better, faster business decisions.

The group, which included representatives from accounting, IT, estimating and operations, settled on a specialized field tracking solution that integrates with its accounting system. Sellman says his team knew enough about construction software options to be predisposed to two specialized systems versus trying to do it all with the accounting tool.

“We know certain features of field tracking platforms are really good but are not the right solution for accounting, and vice versa,” he said. “The fundamental goals of the accounting software don’t lend themselves to the real-time data acquisition that the field tracking software provides.”

Field project teams need systems that are fast, easy and intuitive, according to Sellman. They also want actual, real-time performance data so they can make informed decisions, not in the next month or 6 weeks, but tomorrow, he says.

GRIFFITH COMPANY

“For the field, it’s more about the immediacy of the feedback and being able to know if they are hitting goals and staying on track day to day,” said Chris Malafa, IT director at Griffith Company, a heavy-highway and civil contractor in southern California.

“Accounting looks more at historical records and trends and at projects more globally.”

SCHLOUCH INCORPORATED

Rich King, chief financial officer at Schlouch Incorporated, agrees with the assessment on the separate roles and specialized benefits of the systems. His company is a full-service site contractor that works in central and eastern Pennsylvania.

Like Griffith Company and Mortenson Construction, Schlouch uses a construction accounting program integrated with a specialized field tracking system and depends on the latter to generate what King



quantities to, change orders and pay items, as well as data on active employees and their rates. That information, they say, must traverse quickly to the field tracking system.

Ideally, hours and production quantities should also move seamlessly from the field tracking system to accounting. Mortenson, Schlouch and Griffith accomplish this with batch importing. King says that protocol avoids redundant data entry while still providing an opportunity for validation and control.

Schlouch Incorporated views projects in five phases—initiation, planning, execution, monitoring, and control and close-out—for which, King says, field tracking and accounting systems are complementary.

“Using both systems in conjunction with each other provides a common language for the client teams and project teams to communicate and be successful on the projects,” he said. **CBO**

Doug Seyler is a senior business analyst at B2W Software. He has more than 25 years of experience in the heavy-construction and construction materials sectors through operations management, systems integration and business analysis roles. Seyler holds a bachelor's degree in business management from Saint Michael's College. He holds a master's degree in business administration from Southern New Hampshire University. Visit b2wsoftware.com.



calls “signals on performance” as quickly as possible.

“We want our foremen to see how we are performing compared to the estimate, based on productivity, labor, equipment and other cost information that’s entered on a daily or real-time basis,” said King. “This lets everyone see how we are doing while there is still time to make decisions to change the outcome.”

The accounting system then serves as the final system of record, providing an overall view of project performance and profitability for individual projects and allowing analysis of trends across projects. Project managers and the accounting team at Schlouch meet regularly to review precise project status in accordance with the monthly cycle typically required for accounting. “We need information to turn more quickly than it does at the operations level, and that’s where the field solution comes in,” said King.

THE BOTTOM LINE FOR ALL

Field tracking software not only provides a faster turn-around time for performance data; it also gives contractors more flexibility in how that data is reported back to the field.

“With a separate field tracking system, you have independent control in terms of how it’s presenting that information,” said Malafa. “If you’re just pulling things out of the accounting system or looking at what the accounting budget was, that may not be how you want to drive the field.”

Sellman, Malafa and King agree integration between field tracking and accounting systems is vital. Their accounting systems provide authoritative control over things like the cost codes available to assign hours and

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THE FRINGE-CREDIT, ANNUALIZATION & COMPLIANCE MISTAKES THAT ARE COSTING YOU

If you work on taxpayer-funded jobs or you provide services to a government agency, you're probably subject to the Davis-Bacon Act, McNamara-O'Hara Service Contract Act, state prevailing-wage laws or local living-wage laws. And small compliance mistakes quickly add up to big costs.

On average, a 12-man company that works on public jobs 25% of the time will spend 15 hours a week on compliance issues/paperwork and waste \$67,184 annually on overpaid wages and taxes. Three main reasons contractors overpay on government projects are the misapplication of fringe credits, miscalculation of annualization and misunderstanding of compliance.

1. FRINGE CREDITS

Most prevailing-wage jobs require that you pay a specific amount of fringe benefits to employees. For example, in San Diego, California, you pay \$19.60 per hour in benefits on all prevailing-wage hours worked by carpenters. After deducting the credit for existing benefits (\$4.53 per hour), you pay the difference (\$15.07) in "cash" by adding it as taxable income. This leads to four common mistakes that can

cost tens or even hundreds of thousands of dollars:

- Not using all available credits, thus, overpaying your employees
- Calculating time-and-a-half (too much) on overtime fringe
- Paying the difference in "cash," costing an average of 20% in payroll taxes, workers' compensation (WC), and general liability (GL) insurance, as well as 30% in taxes for your employees
- Assigning prevailing-wage work to employees with low benefits while you could pay higher wages (or offer greater benefits) and spend less to satisfy the prevailing-wage requirements

You may deduct a credit for offering these benefits:

- Employer cost of health insurance (medical, dental, life, etc.)
- Employer contributions to 401(k) plans
- Vacation, holiday and nonmandated sick accruals
- Union benefits and employer dues
- Third-party training fees

You cannot take credit for these:

- Employee deductions (employee paid health/401(k))
- Use of company vehicles, phones and tools
- Statutory benefits (WC and employer taxes)
- Mandated sick, maternity and medical leave
- Mileage or expense reimbursements
- Holiday bonuses

To calculate each credit, divide your annual cost (e.g., employer health equal to \$400 a month or \$4,800 a year) by annual hours worked (e.g., 2,080 hours = \$2.31 per hour). Any amount you pay in "cash" will cost you and your employees a lot in taxes and insurance.

If you pay \$15.07 per hour in cash, you pay another \$3 per hour in employer costs, and employees pay an average of \$4.50 per hour in taxes. That adds up to \$3,750 for an employee working just 500 prevailing-wage hours a year. As such, you're better off depositing the \$15.07 per hour into a third-party fringe trust. A properly structured fringe-cost trust fund can save these costs and still give employees



access to cash and desired benefits. On the other hand, a poorly designed trust fund can block employees from their money and expose you to thousands in taxes or compliance penalties.

2. ANNUALIZATION

You may try to satisfy the fringe by offering more generous benefits, but that will cost more than you expect. Most benefits are subject to annualization, which means that the credit is reduced based on a percentage of prevailing-wage hours each employee works (e.g., if you pay \$5,000 a year in medical benefits for an employee that works on prevailing-wage jobs 25% of the time, you can only take \$1,250 of credit. If you increased the contribution to \$10,000 a year, you would just increase the disallowed credit from \$3,750 to \$7,500.

Alternatively, you can provide certain benefits that are exempt from annualization and take 100% credit on your costs. While annualization-exempt benefits vary by state, they typically include:

- “Cash” payments (requires you to pay taxes, WC and GL)
- “Cash” payments with a Section 125 cafeteria plan (exempt from taxes and sometimes WC)
- Hourly fringe health-savings accounts (contributions limited to \$7,000 a year for employees with a high-deductible family plan)
- Hourly fringe 401(k) contributions

There are myriad fringe trusts on the market, so it’s important to be careful when reviewing the options. For example, the Department of Labor (DOL) determined in 2015 that supplemental unemployment plans were no longer exempt from annualization. Health trusts are also subject to annualization, and some even keep leftover funds when an employee’s hours are more than needed to cover insurance costs.

Depending on a client’s needs, we typically set them up with a multipurpose trust with Section 125, cash-fund and 401(k) components. This provides the largest company tax savings while giving each employee a configurable mix of retirement, tax-reduced spending and available cash as they need it.

If you do set up a trust, you may consider reducing some general benefits that would be subject to annualization. For instance, an employer contributing 100% to employees’ insurance may want to reduce to the state’s minimum requirement (usually 50%).

3. COMPLIANCE

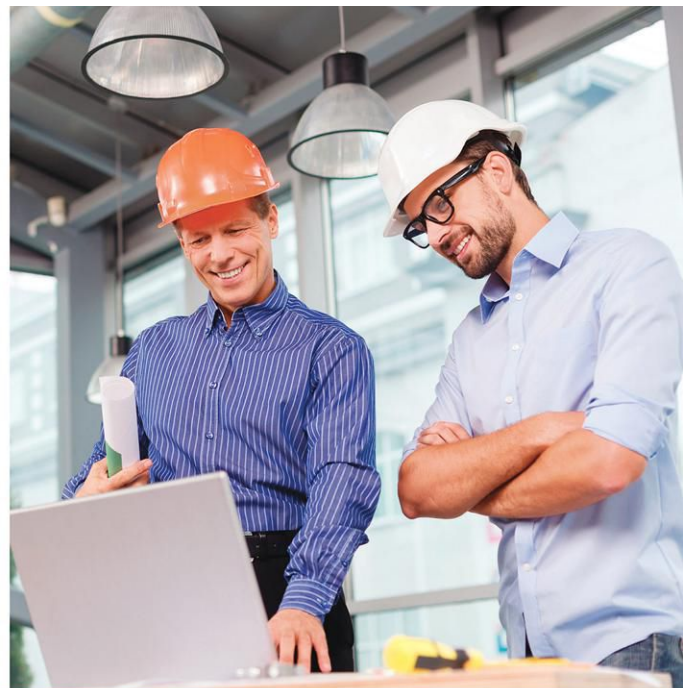
Penalties for lack of compliance can be significant and may come in the form of fines, debarment from government contracts and even criminal prosecution. State and local enforcement can be more aggressive, and private lawyers and unions are constantly trying to



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generate class-action lawsuits. Here are some easy steps to help you stay out of trouble:

- File all certified, nonperformance and equal employment opportunity (EEO) reports accurately and on time.
- Make sure employees are classified correctly.
- Calculate the fringe credits for each employee—not averages.
- Keep all reports and make sure they match (e.g., timecards, daily reports, 5500 forms, fringe statements, etc.).
- Know your unique state laws. A few examples include:
 - o Forty-five states and cities require sick pay.
 - o Some cities require minority, disadvantaged worker ratios.
 - o Some states calculate overtime using averages, while others rate in-effect.
 - o Many states require predetermined rate increases, plus travel and subsistence payments.
- Pay weekly on federal (and some state) jobs.
- Have employees sign off on all deductions, and do not use any disallowed deductions on certified payrolls (e.g., uniform, damage or unreturned items).
- Manage your subcontractors' certified work. You are responsible for their compliance issues and employee payments. California and Massachusetts extend this to private jobs, too.

On the other hand, if you understand the laws, you can make them work for you. For instance:

- *Track nonproductive hours*—Drive time, shop time and off-site hours are generally exempt from prevailing wage and fringe.
- *Go negative on fringes*—On federal and many state jobs, you can take credit for benefits in excess of the required hourly fringe rate to reduce the base prevailing wage.
- *Understand your state's wage determinations*—California allows employers to take credit against the fringe requirement without capping against individual sub-benefit amounts.

Government contracts can be profitable but risky. As such, review your requirements with your awarding agency, general contractor and attorneys. Automate where possible and look into a fringe trust to increase profitability and outbid your competitors. **CBO**

Jack Biltis is the president of eBacon, a prevailing-wage software company that automates calculation, reporting and compliance. eBacon combines mobile time tracking, fringe-benefit management, payroll and reporting. Biltis is a licensed securities principal, insurance agent and enrolled agent practicing before the Internal Revenue Service. Biltis graduated from the University of Pennsylvania Wharton Business School. Visit ebacon.com.



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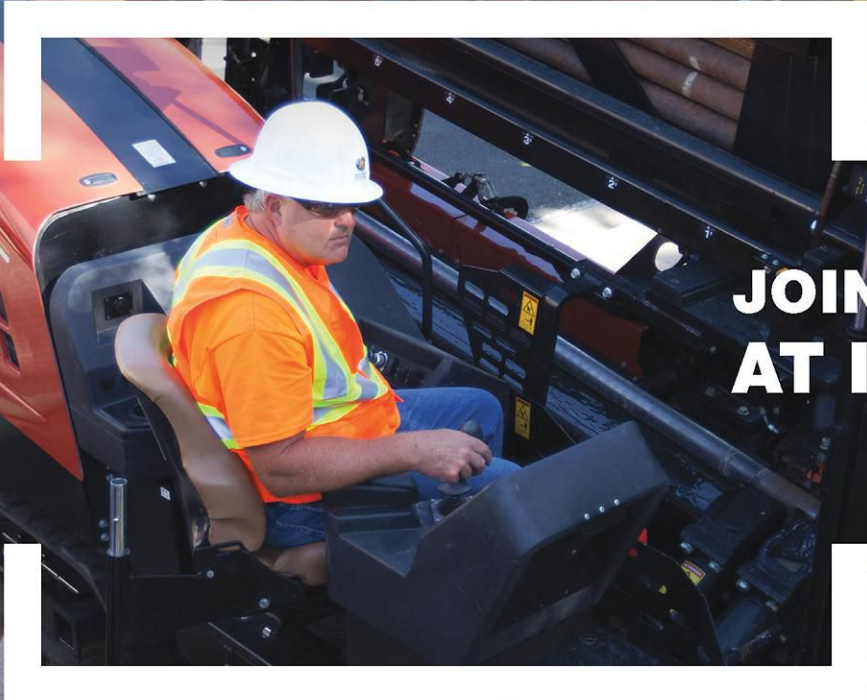
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How to Turn Your Compact Excavator Into a Profit Stream

5 new jobs to take your project potential beyond just digging

BY JASON BOERGER

Compact excavators are known for being efficient digging machines. But, when paired with the right attachments and a coupler system, compact excavators can perform a wide variety of tasks (beyond excavation) and generate new revenue sources.

If you're looking for untapped streams of profit, consider these five jobs that use a compact excavator for more than digging.

1. BREAKING

Compact excavators are ideally suited for demolition work and can often complete small-scale demolition jobs in a day. The combination of an excavator and breaker can be used to bust up concrete and asphalt driveways, sidewalks, trails, and swimming pools.

This powerful pairing can also reduce smaller structures, such as garages, sheds and retaining walls, into manageable piles. When an operator is done breaking the material, a quick switch to a bucket and clamp makes it easy to load debris into a truck or roll-off container for processing.

2. CLEARING

Clearing areas zoned for new development is an opportunity to generate additional income with your compact excavator. When outfitted with a tooth bucket and a clamp, or with a three-tined grapple,



compact excavators are capable of grabbing, pulling and dragging rooted undergrowth from the ground.

Additionally, a compact excavator paired with a clamp has the lifting force to move large obstacles, such as fallen logs, stumps and boulders. And a flail-mower attachment can efficiently clear thick brush and saplings up to 4 inches in diameter.

For clearing in hard-to-reach areas, compact excavators configured with an extendable arm can provide more than

2 feet of additional reach beyond the standard excavator arm length. This helps minimize the need for the operator to reposition the machine when digging or handling debris.

3. COMPACTING

An excavator fitted with a plate compactor becomes a dual-use machine for increased return on investment. After digging with a bucket, a plate compactor attachment can be used to compress soil,

eliminating the need for a crew member to pack down the dirt with a hand tamper or to man a walk-behind unit.

Plate compactor attachments are more powerful than hand compactors and more effective in sloped, hard-to-reach areas. Thus, the job is done in less time, reducing overall costs.

4. LIFTING

Compact excavators are ideal for loading and unloading trucks containing heavy items, such as pavers, lumber and retaining wall blocks. When outfitted with a grapple, compact excavators provide precision grasp, allowing operators to not only move, but also sort materials.

Moreover, this combination can replace a tractor loader backhoe on horizontal directional drilling (HDD) projects to lift and hold components in place for borehole entry as well.

The compact size, attachment versatility & proven performance have taken compact excavators beyond their traditional role as digging machines.

5. SITE PREP

Prepping a site for paving or planting before it's too early to dig in spring is another way to increase revenue with a compact excavator. A ripper can be used to scarify ground frost and hardened terrain, while a standard bucket is needed to haul in aggregate base material. Combining a bucket with swing

accessories adds significant range of motion for more versatility on a jobsite. The wrist-like action moves the excavator bucket to either side—improving productivity by tilting the bucket instead of moving the entire machine—to cut swales, shape contours and create slopes.

Compact excavators have proven themselves a popular machine for traditional digging tasks. However, the compact size, attachment versatility and proven performance have taken compact excavators beyond their traditional role as digging machines and turned them into a new revenue stream. **CBO**

Jason Boerger is a marketing manager for Bobcat Company. Boerger has spent 5 years at Bobcat Company, during which time, he has held positions in the product training and marketing departments. Visit bobcat.com.



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3 Reasons to Invest in a Drone

Discover the fastest way to gather indispensable data on your jobsites

BY HELGE JACOBSEN

Today's jobsites are complex environments requiring multiple trade suppliers to coordinate across all project stages. Additional complexity comes in the form of labor challenges, regulatory changes and, for some contractors, outdated work systems. Fortunately, in a historically low-tech industry, advanced technologies are starting to mature and add real value to construction site management.

Drones, for example, have definitely become more commonplace on jobsites. According to a recent survey from Software Connect, 26% of construction professionals at small and midsize companies are already using or plan to use drones by 2020. Another study, by DroneDeploy.com, found that drone usage on construction sites rose by 239% from 2017 to 2018. However, this comes as no surprise to those who understand the true value drones deliver.

WHY DRONES?

For one thing, drone technology has many different applications. Those equipped with 3D laser scanners can help contractors gather vital data at every stage of a project. For example, they can perform worksite surveys, volumetric surveys and inspections. Drone-based jobsite surveys make it possible to complete the



master planning of a site in just a few hours (instead of days or weeks). And drone-enabled inspections provide insight, highlighting ways to boost productivity, safety and profitability in specific situations—a feat that would be impossible to achieve manually.

Another tailwind driving drone adoption is the availability of end-to-end, turnkey drone services. The provider manages site access, airspace clearance, equipment, flight planning and execution, data collection, analysis and processing, and finally, delivers the end-product to the contractor. This model requires no special

expertise on the contractor's part and essentially eliminates start-up costs and liability concerns.

Third-party drone services also provide support to construction companies that have their own drone divisions by supplementing in-house capabilities with additional equipment, pilots and data-processing capacity on demand. Services range from collecting remotely sensed data and producing standard-image and video products, to more advanced imagery, such as thermal infrared, multispectral and hyperspectral. A DroneDeploy survey of construction

Today, site master planning, as-built verification & the updating of facility records can be accomplished in a fraction of the time. And drone-based worksite surveys can be completed within absolute accuracies of less than a fraction of an inch.

companies using drones found:

- 61% of respondents reported more accurate measurements
- 55% cited increased safety
- 52% said they experienced a faster path to data insights

What follows are three ways that drones can boost efficiency through data collection on your construction projects.

1. JOBSITE SURVEYS

Historically, contractors have had to expend considerable time and expense to acquire survey data with a high degree of accuracy. Today, site master planning, as-built verification and the updating of facility records can be accomplished in a fraction of the time. And drone-based worksite surveys can be completed within absolute accuracies of less than a fraction of an inch.

Many construction applications depend on access to engineering-grade, 3D data. Drone-collected data (the x, y, z coordinates within a 3D, scanned environment) must be seamlessly integrated with a contractor's existing practices and methodology—another area where an end-to-end drone service provider can help.

After data collection and verification, the resulting point cloud (a visualization of the data points in 3D) can be used to create a multitude of other analytics. Digital surface and terrain models can be powerful tools for civil engineering projects. And laser-scan data of facilities and other structures can be used to create 3D models for visualization, planning and systems testing.

2. VOLUMETRIC SURVEYS

Materials management is far easier and more efficient when a contractor has access to aerial images that show exactly where materials are at a given point in time. A drone-based volumetric site survey addresses this need. And recent advances in the ability to overlap aerial imagery from multiple viewpoints provides the foundation for rapid volume, as well as cut/fill analysis.

Drone-enabled volumetric surveys start by documenting specific volume, void and area calculations as baseline analytics. From there, additional business insights can be gained from further analysis. For example, after computing the cubic feet of a wood chip pile, a contractor may want to factor in the species-specific density of the wood and determine wet or dry tons for accounting purposes.

3. SAFE, PRODUCTIVE INSPECTIONS

Drone-enabled inspections can significantly increase productivity and safety at a jobsite by providing what is known as "situational awareness." Simply put, situational awareness is knowing what's going on in a particular environment and comprehending how those goings on affect the present and future of that project and environment.

The latest advancements in drone technology allow for rapid deployment of lightweight, remote-sensing drones—machines that can accomplish inspections in much less time than it would normally take using scaffolding or lifts for the same purpose. The process is very agile. Drones

can navigate jobsites to eliminate the risks involved in having a person work at height. As drone-based inspections become more common on jobsites, contractors are using them in more challenging environments, such as bridge and tower inspections. The ability to inspect inaccessible, dangerous or remote areas has never been faster, safer or more cost-effective than it is with drone technologies.

For some contractors, simply collecting the data does not provide the level of understanding they need to solve complex jobsite problems. In these situations, a service provider can employ machine learning and artificial intelligence tools to refine the data through analytics. For example, if a company manages a laydown yard and wants to track the changes that occur daily, change-detection algorithms can identify asset movements and supplies that are running low.

Drones can deliver tremendous value to construction, and a great deal of their potential is still untapped. The technology is tailor-made for jobsites where uptime is essential, crews are costly, and structures must last far into the future. Contractors can expect drones to play an increasing role in helping construction companies leverage data to increase productivity, safety and the bottom line. **CBO**

Helge Jacobsen is vice president and general manager at Advanced Solutions for equipment rental leader United Rentals. His 20 years of senior experience with market leaders include leadership positions in finance, manufacturing and supply chain, global sales and operational excellence. Visit unitedrentals.com.



7 Steps to an Effective Quality-Management Program

Thinking past the punch list with processes that drive project success

BY ED CALDEIRA

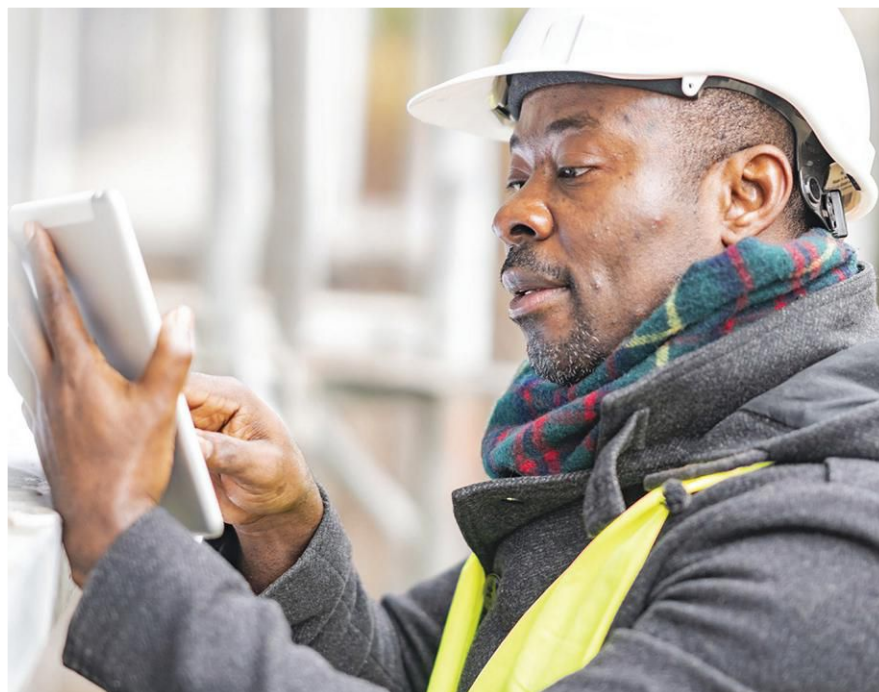
In construction, punch lists are just one element of a comprehensive quality-management program. If you want to reduce defects over time, with the goal of achieving great quality the first time, punch lists alone will not get you there.

When creating a new quality-management program, think about it just as you would any other key component of your business—safety procedures, human resources practices, financial strategy, IT management, etc.—and follow a familiar process that includes setting goals, developing a strategy based on those goals, and executing that strategy and measuring progress.

When you take this approach, quality management becomes part of the culture, and it's clear that leadership is committed to the program. On the other hand, if you treat your program like a low-priority project, you'll get results in line with those efforts. Following these seven tips for starting a quality-management program will set your projects up for success.

1. DEFINE YOUR GOALS

Every construction company has different reasons for implementing a quality-management program. These might include mitigating risk and avoiding legal issues; complying with client contracts and insurance requirements; increasing



sales by creating competitive advantage; increasing profits by reducing callbacks and waste; improving productivity by eliminating rework; growing the business by implementing scalable systems.

When setting goals, be realistic, but aim high. Many construction company owners buy into the industry misconception that deficiencies are unavoidable. This leads to a certain amount of leniency when it comes to inspections and punch lists. When you commit to achieving the highest

quality the first time around and implement the systems that will enable you to eliminate deficiencies over time, all of the goals listed above are achievable.

2. DETERMINE YOUR MODEL

As with most business processes, there are many approaches you can take, depending on the goals you have defined, to determining your business model. For example, if your goal is risk mitigation, you might set up your quality department so

that the quality manager and their staff do all of the inspections throughout the entirety of the project.

At the other end of the spectrum, if you want to eliminate rework, involve construction managers in quality-management processes, such as jobsite walk-arounds, punch-list management, inspections, trade-partner evaluations and reporting metrics. Based on the goals you have outlined, define the roles and responsibilities for everyone involved in quality-management processes (including quality managers, general managers and trade partners) and communicate them to every member of the team.

3. COMMIT RESOURCES

Regardless of the model you choose, the teams doing the work must have the necessary resources to do it effectively. If you decide that the quality department is

performing all inspections, you may need to bulk up your employee count, making sure there are always enough quality inspectors available for all projects.

If construction managers are to adopt a larger role, they might need resources like ongoing training, software and support staff. When you allocate the resources that support the business model, try not to view quality management as purely a cost center. Remember that the investment you make in quality can yield big returns, especially when your goals are achieved.

4. HIRE THE RIGHT PEOPLE

Oftentimes, when creating a new quality-management program, business owners look to one of the best performing superintendents or hire somebody who has expertise in building science. Although these people might have the right skills for identifying deficiencies, they don't

always have the necessary experience for developing and managing business processes and procedures.

Someone who primarily has management skills, with technical skills as a plus, should run a quality program. This might be a project manager or safety program manager who has the expertise to set up and maintain quality-improvement processes and hire qualified inspectors to perform the work.

5. ESTABLISH ACCOUNTABILITY

It's important to recognize that a successful program does not depend solely on the quality manager. Every person in the company plays a role in quality management, whether it's identifying ways to avoid common mistakes, performing inspections or ensuring that the quality team has the necessary resources.

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When you build a culture of quality, everyone involved feels accountable for ensuring the work is done right the first time. It's the difference between employees speaking up when they see a potential problem and keeping their heads down while deciding, "That's not my job." Quality is everyone's responsibility, and it starts at the top—with the leadership team.

6. DEFINE & REPORT METRICS

Defining and reporting metrics will help you track progress toward reaching your goals. To do this, your metrics and your goals must be in alignment. For example, if your goal is to achieve the highest quality the first time, eliminating rework, a good metric would be the percentage of jobs this is achieved on.

If you want to improve productivity, you might track the amount of time required for rework, which can also be reported

in terms of cost savings. Seeing how your metrics change over time can be both informative and motivating. When the team sees that their efforts to reduce deficiencies are resulting in measurable progress, they will continue to implement the processes outlined in the quality program, long after the new wears off.

7. MAINTAIN ENGAGEMENT

Introducing any type of new initiative takes stamina. It's not uncommon for companies to launch a quality-management program with a big initial push and high hopes for immediate results. But the reality is that it takes time to roll out new systems, train people on new processes and change mindsets about quality.

Again, think of quality management as a business process and apply the same approach. Create a strategy to introduce new processes incrementally and set

milestones that you can work toward over time. Metrics and reporting will help keep employees engaged, especially when you use this information to celebrate successes along the way.

Starting a new quality-management program might feel daunting, but the effort is well worth it. When you approach it as a business process and give it the resources it deserves, a successful program helps you achieve organizational goals that go beyond having shorter punch lists. **CBO**

Ed Caldeira is the founder of FTQ360, a company that provides a quality and safety app for the construction industry. He has implemented quality-management programs in hundreds of companies for a full range of construction projects. Caldeira is a champion for "building it right the first time" with quality and safety. Visit ftq360.com.



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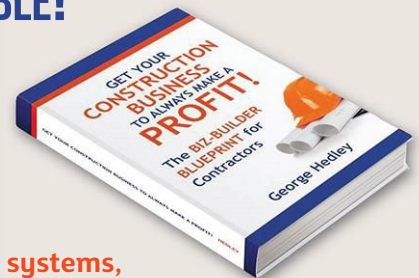
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New Products to Watch

Selected by the editors of Construction Business Owner, these new-to-the-market products are just a few of our favorites recently released to the construction community. Stay tuned in every issue to find out what you need to know about the latest gear, solutions & industry-leading innovations.



PURE SAFETY GROUP

Checkmate TR3 Tripod

Released: 4/29/19

Availability: U.S., Canadian & European markets

What's new? New crown and foot design that makes it stronger yet more lightweight than other tripods

Specs: Legs lock in the open position automatically during use and adjust for height with captive pins; detent pins secure legs to tripod using PVC-coated keeper wires; pivoting spiked feet and rubber soles work for soft or hard surfaces; anti-splay webbing prevents legs from splaying under load

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JOHN DEERE

Construction Simulator

Released: 3/25/19

Availability: U.S. & Canadian markets

What's new? Simulator built on state-of-the-art technology that teaches machine controls, hand-eye coordination, safe operation and operator technique

Specs: Features swappable controls that allow for the quick interchange of multiple machine types; offers highly detailed, realistic virtual environments designed to cover the basics and operator duties through jobsite tasks

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BOSCH POWER TOOLS ▶

GBH18V-26D 18V EC Brushless, 1-inch SDS-plus Bulldog Rotary Hammer

Released: 4/9/19

Availability: U.S., Canadian & European markets

What's new? Delivers impressive power-to-weight ratio in a cordless tool

Specs: Weighs 5.8 pounds and delivers 1.9 foot pounds of impact energy to ensure strong performance

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Released: 3/1/19

Availability: All global markets

What's new? The most durable, capable and luxurious cab and chassis trucks Ram has ever engineered, with a weight reduction of up to 120 pounds

Specs: Offers 35,220 pounds of towing capacity; 12,510 pounds of payload; the standard 6.7-liter HEMI V-8 engine with up to 410 horsepower and 429 pound feet of torque; Fuel Saver technology cylinder deactivation; upfitter interface module with more than 70 inputs and outputs; adaptive cruise control; forward collision warning; automatic emergency braking with trailer brakes; center console workspace with more than 12 storage combinations; ParkSense park assist system

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▲ JCB

TL25 LPG & TL30 LPG Teletruk

Released: 5/1/19

Availability: U.S., Canadian & European markets

What's new? Liquid propane gas (LPG)-fueled telescopic forklifts suited for emissions-sensitive applications, including those in logistics facilities, food processing and greenhouse operations

Specs: Lift capacity of 5,500 pounds and 6,600 pounds, respectively; lift height of 13 feet, 1 inch and reach of 4 feet, 8 inches

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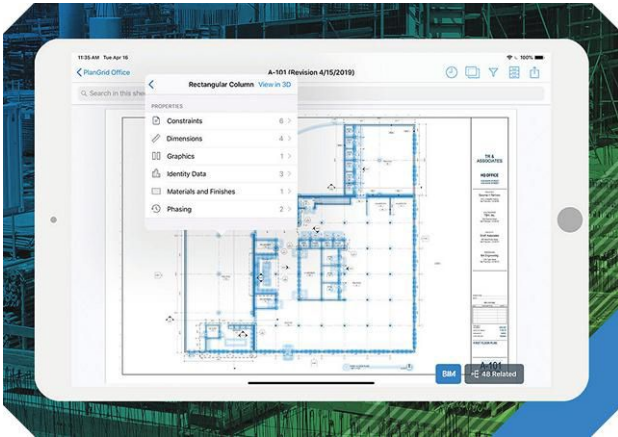
Released: 5/1/19

Availability: U.S., Canadian & Latin-American markets

What's new? Improved total fuel economy of 6% from previous model

Specs: Features a 4.5% increase in bucket capacity to a 7-cubic-meter capacity; undercarriage with three, single-sided upper rollers on each side of the track frame that help maintain track shoe clearance and reduce debris build-up

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▲ PLANGRID, AN AUTODESK COMPANY

PlanGrid BIM

Released: 4/23/19

Availability: All global markets

What's new? The first PlanGrid/Autodesk integration that gives field builders access to rich BIM design data at their fingertips

Specs: Automatically links and calibrates model data from Autodesk Revit; allows users to navigate plans in 2D, see all object properties and tap into 3D from the PlanGrid app; now available on web and iOS

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▲ DOOSAN INFRACORE NORTH AMERICA LLC

DX35-5, DX42-5 & DX50-5 mini excavators

Availability: U.S., Canadian & European markets

Released: 3/1/19

What's new? Three new models in Doosan's most-popular size classes of mini excavators that come standard with an enclosed cab with heat and air conditioning and the combination of a quick coupler, bucket and thumb attachments

Specs: Range from 33.5 horsepower to 49 horsepower; DX35-5 has a maximum dig depth of 10 feet 3 inches; DX42-5 has a conventional tail-swing model with a maximum dig depth of 10 feet, 6 inches; DX50-5 is a minimal-tail-swing model with a maximum dig depth of 11 feet, 7 inches; complement the larger 6- and 8-metric-ton Doosan mini excavators [DX63-3 and DX85R-3]

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Annual Value of Construction Put in Place

2017/2018/March 2019 Comparison

This chart compares the two previous years' total value of construction put in place to an annual forecast based on March 2019 figures. (Millions of dollars. Totals may not add up perfectly due to rounding.)

	2017*	2018**	Mar 19
Total Private Construction	950,845	997,921	961,535
Residential	509,933	546,575	500,926
Nonresidential	440,912	451,346	460,609
Total Public Construction	288,719	295,203	320,671
Residential	6,698	6,642	6,049
Nonresidential	282,021	288,561	314,622
TOTAL Construction	1,239,564	1,293,125	1,282,205

*Seasonally Adjusted Annual Rates. Source: U.S. Census Bureau.

**With the May 2018 release, unadjusted data will be revised back to January 2016 and seasonally adjusted data will be revised back to January 2011. With each May release, seasonally adjusted data will now be revised for an additional 5 years beyond the revision period for unadjusted data. Research has shown that this revision span should produce more reliable seasonally adjusted time series.

\$1,282,205

MARCH 2019 TOTAL ANNUAL VALUE OF
CONSTRUCTION PUT IN PLACE

“Though **billings** haven’t **contracted in a while**, it is important to note that it does follow on the heels of a particularly **tough late winter period for much of the country**,” said AIA Chief Economist Kermit Baker, Ph.D., Hon. AIA.

“Many **indicators of future work at firms still remain positive**, although the pace of **growth of design contracts** has slowed in **recent months**.”

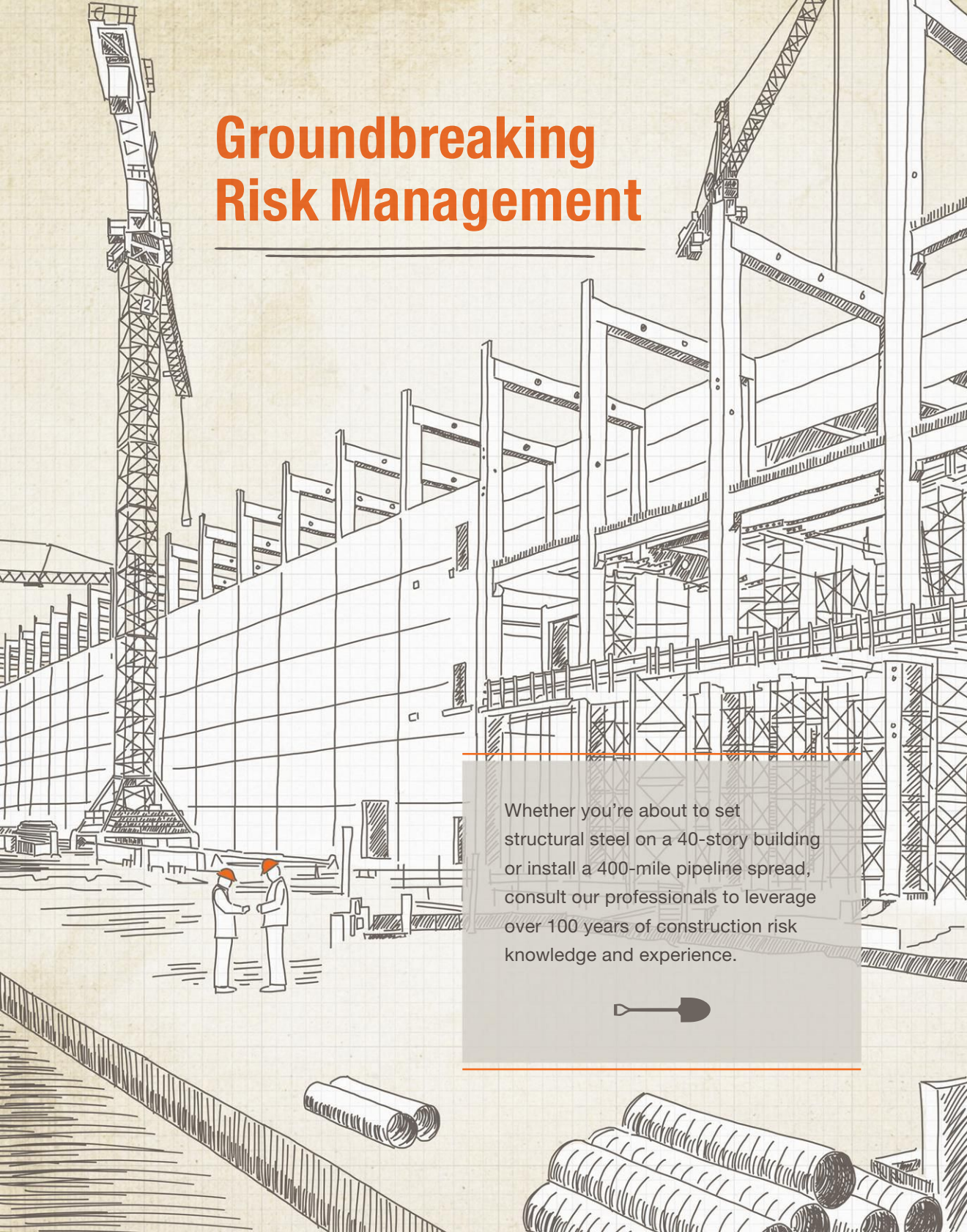
AIA Architectural Billings Index (ABI)

National			*Regional - Billings				*Sectors - Billings			
Month	Billings	Inquiries	Northeast	Midwest	South	West	Multifamily Residential	Commercial/Industrial	Institutional	Mixed
Oct-18	50.4	58.6	51.8	57.8	48.4	46.9	52.3	48.9	52.0	52.7
Nov-18	54.7	63.1	56.8	53.1	50.5	49.0	51.2	53.8	50.8	53.8
Dec-18	50.4	55.6	51.6	56.3	49.4	49.2	49.8	51.2	53.1	50.2
Jan-19	55.3	59.6	52.4	54.4	54.7	51.5	52.6	52.6	52.9	53.8
Feb-19	50.3	59.8	51.5	51.3	58.3	51.6	51.6	53.9	50.9	57.2
Mar-19	47.8	59.8	43.5	48.7	54.2	47.2	47.7	47.0	48.9	53.1

For more information on the index or to subscribe to the complete historical data going back to 1995 for your internal analysis, **please contact economics@aia.org**. The ABI presents monthly construction billings data, using a base score of 50. A score of more than 50 indicates a growth from the previous month, and a score of less than 50 indicates a contraction from the previous month. A score of 50 indicates no change. Source: The American Institute of Architects (AIA), Architecture Billings Index (ABI).

*Regional and Sectoral indexes are 3-month moving averages, due to small sample size. All data is seasonally adjusted.

**Every January, the AIA research department updates the seasonal factors used to calculate the ABI, resulting in a revision of recent ABI values.



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