CONSTRUCTION® BUSINESS OWNER
THE LEADING BUSINESS MAGAZINE FOR CONTRACTORS

# GRIT, GEARS & GUIDANCE

OWNER & SITE-WORK SPECIALIST
MICHAEL MACURA JR.
ON WHAT FUELS HIS SUCCESS



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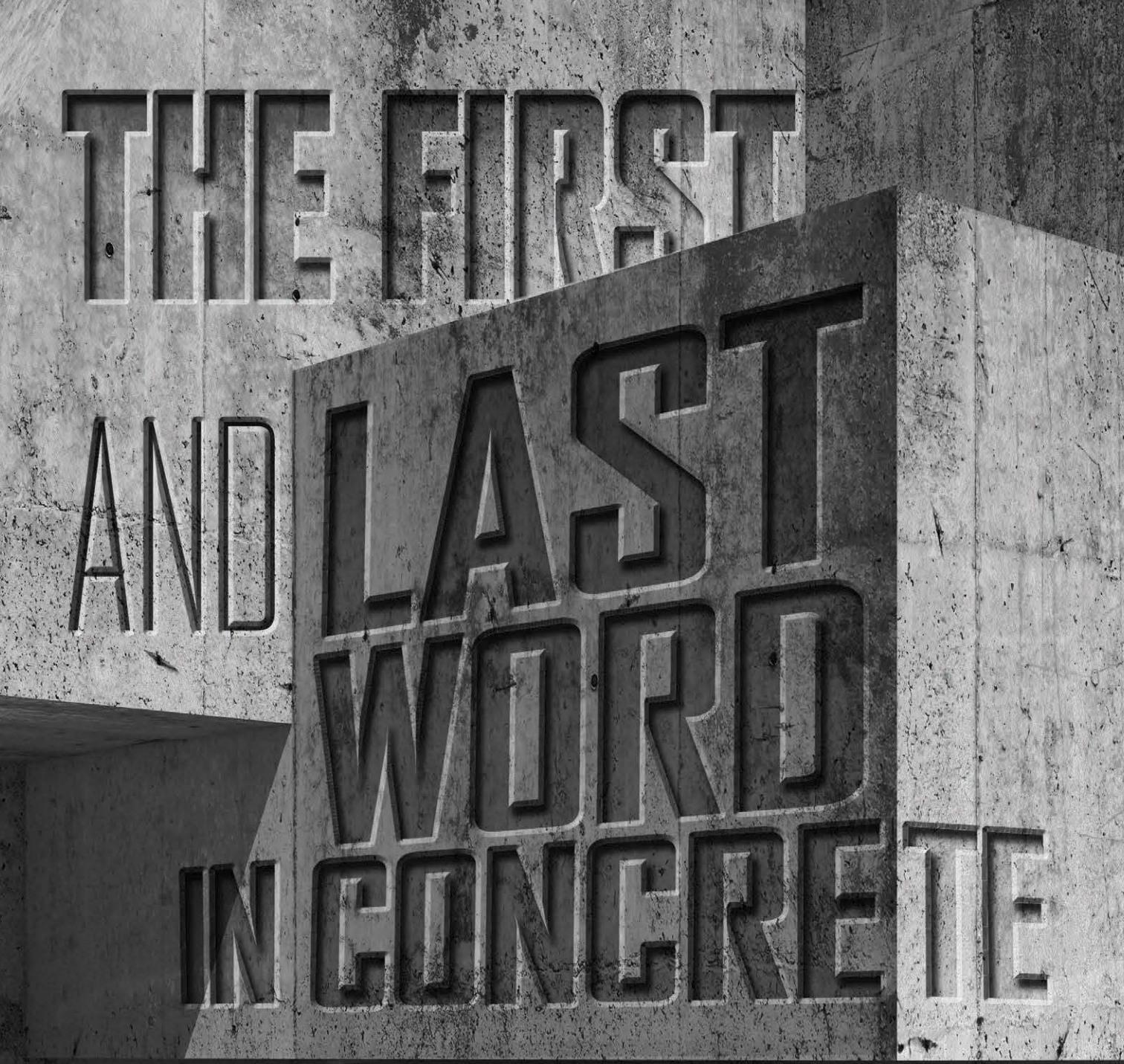
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# FROM THE EDITOR

**KATHY WELLS**



Most construction business owners know two versions of grit—the grit that many find dusted on their work boots every day, and the grit that is a form of strength, possessed and drawn out in adversity. As your role requires, you need both. But it's that second grit, that firmness of mind and spirit, that keeps you moving your business forward. That's the case, at least, for this month's cover contractor, Michael Macura Jr.

Macura came of age in the construction industry, watching his father conduct business and make a name for himself in contracting. It's the same grit that fueled Macura to start his own business in 2013, Macura Excavating. Today, the company is a well-established site-work subcontractor. Along with Macura's story, "Grit, Gears & Guidance" on page 78 shares a few lessons he's learned as an owner, including his keen advice on finding the right equipment strategy.

More on the topic of equipment, "Repair It or Regret It" on page 81 takes a few tips from two Caterpillar senior parts and service marketing consultants on how to proactively address service issues and problem indicators to gain substantial savings.

And, kids, get your coats, because "A Winter Walk-Around" on page 84 shares five maintenance points to protect your equipment before and after this season's impending freeze.

Looking farther ahead, with economists forecasting a recession in the next year, it's imperative that the tools you use every day on your jobsites and in the back office deliver on their promises, so you can continue to work efficiently and profitably. And that's what the companies in our Corporate Capabilities section, starting on page 22, aim to do. The products and services in these pages are built to last and designed to help your company succeed. Simply put, they are here to help you establish a line of continuity for your business, regardless of what might be on the economic horizon.

In webinars this month, "How a Single Data Set Can Transform Your Business" will provide the tips you need to find simplicity in the complex world of construction. The free, live event, sponsored by Viewpoint, will be held Oct. 24, 2019 at 2 p.m. EDT. Don't miss it! But, if you do, don't worry. We archive our webinars on demand at constructionbusinessowner.com/webinars, so they're available anytime.

Lastly, I can't say enough about the outstanding response our readers gave in their nominations for CBO's Outstanding Women in Construction. These submissions shared the best and the brightest, and showcased the skills and successes of nearly 200 of the industry's finest. The list of contenders was long, and their stories were remarkable, so the finalists who made the cut are certainly deserving of the honor. To see who's on the list, visit constructionbusinessowner.com/nominate-outstanding-women-construction, and keep an eye out for the special section and one-on-one interviews with the finalists in our November issue.

One more thing: If you didn't get a chance to submit a nomination this year, mark your calendars. Nominations for Outstanding Women in Construction 2020 will open July 1, 2020.

Take good care,



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# OUTSTANDING WOMEN IN CONSTRUCTION

Construction Business Owner (CBO) is honoring some of the industry's most hardworking construction professionals in a special section dedicated to Outstanding Women in Construction. The November issue of CBO will showcase the finalists—20 smart, talented, industrious women of construction—and the ways in which they're driving the industry forward.

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**For a sneak peek of the list of finalists, visit**
**constructionbusinessowner.com/owic**

### ▶ Former President Barack Obama to Keynote 2019 Greenbuild

The United States Green Building Council (USGBC) and Informa Connect announced that former President Barack Obama will speak at the Wednesday keynote of the 2019 Greenbuild International Conference and Expo. This year's conference will take place Nov. 19-22 in Atlanta, Georgia, at the LEED Gold Georgia World Congress Center. "Obama is a global leader and a longtime friend of the green building community. While in office, his administration negotiated the landmark Paris Climate Accords, expanded the impact of our field, and helped open the door for energy efficiency investments in both the public and private sectors," said Mahesh Ramanujam, president and chief executive officer (CEO), USGBC. "As the green building movement evolves and continues to permeate our everyday lives, Obama is a valuable leader to bring that vision to life," said Andrew Mullins, CEO, Informa Connect. Visit greenbuildexpo.org.

### ▶ Dodge Data & Analytics Releases Midyear Update

Dodge Data & Analytics' 2019 Midyear Update, presented by Chief Economist Robert Murray via webinar, reported that the growth the industry has seen throughout the past few years (largely from 2016 to 2018) has somewhat flattened out in 2019. Murray said it's evident that the industry is seeing a deceleration of growth in 2019, particularly in public works projects. However, whether the construction industry—and the economy overall—is heading for a recession or is just stabilizing, remains to be seen. Economists expect to see a gross domestic product (GDP) growth rate of 2%, following a strong 3.1% in Q1 2019 and a drop to a rate of 2.1% in Q2. According to the forecast, commercial and multifamily sectors will be impacted first by a slower economy. In terms of total U.S. construction starts to date in 2019, Dodge reports moderate decreases and increases (from 1% to 11%) in all sectors but one—electric utilities and gas plants increased 62%—which has led to an overall decrease of 1% for total starts. Murray predicts that a potential slowdown in 2020 would likely be relatively modest. Visit construction.com

### ▶ Turner Construction Company Hires Financial Manager



**Joe Fuda**

Turner Construction Company hired Joe Fuda as financial manager for the company's Mid-South business unit, covering the Tennessee and Alabama markets. Fuda joins Turner from Quantum Real Estate Management in Washington, D.C., where he served as a financial controller. In his new role, Fuda will work closely with Turner's leadership team on the development and preparation of annual profit plans, forecasting reports and other key business decisions. His responsibilities will also include training the team on financial policies and procedures, and leading and mentoring junior staff members. He will be based out of the company's Nashville, Tennessee, office. Fuda holds a master's degree in accountancy from Lipscomb University and a bachelor's degree from Pierce College. Visit turnerconstruction.com

### ▶ USDOL Investigation Leads to $130,788 in Back Wages for Michigan Masons

Brickworks Property Restoration, a masonry company based in Clinton Township, Michigan, will pay $130,788 in back wages to 58 employees after the U.S. Department of Labor's (USDOL) Wage and Hour Division (WHD) found the employer violated the Fair Labor Standards Act's (FLSA) overtime and record-keeping provisions. WHD investigators determined Brickworks Property Restoration failed to pay employees overtime at time-and-a-half their regular rates when they worked more than 40 hours in a workweek. Brickworks Property Restoration also violated the recordkeeping provisions of the FLSA when they failed to maintain accurate records of payroll and hours worked. "Employers are responsible for ensuring that they pay all employees the wages they have legally earned and for keeping accurate records of the number of hours they work," said Wage and Hour District Director Timolin Mitchell, Detroit, Michigan. "We encourage employers to contact us for guidance and to use the wide variety of tools we offer to help them fully understand their responsibilities." Visit dol.gov.

### ▶ Skanska USA Promotes EVP/GM



**Dennis Yung**

Skanska USA announced that Dennis Yung, an industry veteran with more than 30 years of experience in commercial construction, has been promoted to executive vice president (EVP) and general manager (GM) overseeing Houston and Dallas. Yung joined the company in 1999 and most recently served as senior vice president and national preconstruction director. In his time with Skanska, Yung has focused on innovative and strategic initiatives that advance the preconstruction and project planning services group. In his new role, Yung will oversee Skanska USA Building's Houston and Dallas offices while focusing on developing new client relationships, managing construction projects and cultivating new opportunities throughout the Texas market. Yung holds a bachelor's degree in building construction from Texas A&M University. Visit usa.skanska.com

### ▶ ARA Survey Finds Contractors Expect to Increase Rental Activity

The American Rental Association's (ARA) "Rental Customer Needs Study," conducted by Research Strategy Group, an independent research firm for ARA, found that 93% of professional contractors surveyed rented equipment in the last year. Of those who rented, 92% planned to rent as least as much as last year, and 52% expected to increase renting over the next year. The study found portable toilets, lifts and scaffolding, backhoes, dump trucks, and mini excavators are the most popular rental items among contractors. Reasons contractors rented included: it made more financial sense than buying equipment (45%); they needed equipment for immediate use and did not want to purchase (43%); and they needed to use the equipment infrequently or only for a short time period (43%). The study concluded that contractors who expect to rent more next year will do so because they plan to use what they currently rent more frequently or they plan to take on more quick-turnaround projects. Data for the study came from surveys of various types of contractors, including residential building, specialty, nonresidential and commercial building, landscape, utility, road and highway construction, site development/earthmoving, and more. Visit ararental.org.

### ▶ Hino Opens New Manufacturing Facility

Hino ushered in a new era of manufacturing capability at the company during a grand opening ceremony that was attended by West Virginia Governor Justice, Senators Manchin and Capito,

Congressman McKinley, local government officials, dealers, customers, suppliers, and media. The attendees took part in a tour of Hino's nearly 1-million-square-foot facility in Mineral Wells, West Virginia; a tree-planting tradition; and a Kagami-Wari ceremony to consummate Hino's growth commitment to the U.S. Hino Motors Ltd. President and CEO Yoshio Shimo attended the event and commented, "Hino is committed to building its trucks and products in the market it operates in. We have committed $100 million in capital investment to our new state-of-the-art manufacturing facility, generating 250 new jobs." Shimo also announced an additional commitment of $40 million in investment to meet increased demand and product configurations, creating an additional 250 new jobs. Visit hino.com.

### ▶ Deere & Company Elects CEO/Board Member


John May

The Deere & Company board of directors elected John C. May as a member of the board, effective immediately, and to the position of CEO, effective Nov. 4, 2019. May has served as Deere's president and chief operating officer (COO) since April 2019. "[May's] experience in precision agriculture, information technology and overseas operations will be instrumental in driving the company's digitalization journey and extending its success in agricultural and construction equipment," said Samuel R. Allen, chairman and CEO. Allen will continue as chairman of the board of directors after he steps down from the CEO position. May joined Deere in 1997 and became part of the senior management team in 2012 as president, agricultural solutions and chief information officer. Last year, he was named president of the company's worldwide agriculture and turf division, with responsibility for the Americas and Australia, the global harvesting, turf and utility, and crop care platforms, and intelligent-solutions group. May holds a bachelor's degree in health information management from the University of New Hampshire and a master's degree in business administration from the University of Maine. Visit deere.com.

### ▶ USDOL Awards Nearly $1.5M to Increase Industry Opportunities for Women

The USDOL has awarded nearly $1.5 million in grant funding to organizations in Illinois, Virginia and Wisconsin to help recruit, train and retain more women in quality pre-apprenticeship and apprenticeship programs. The grants will help women pursue careers in manufacturing, infrastructure, cybersecurity, health care and other industries. The 2019 Women in Apprenticeship and Nontraditional Occupations (WANTO) grant recipients are: Chicago Women in Trades ($494,460), Hampton Roads Workforce Council ($500,000), Wisconsin Regional Training Partnership Inc. ($498,055). "In the past 2 years, we have seen women's unemployment rate fall to its lowest since 1953," said Acting U.S. Secretary of Labor Patrick Pizzella. "We are committed to expanding access to apprenticeship opportunities that will help even more women find pathways to family-sustaining jobs and fulfilling careers in all industries." The DOL's Women's Bureau and its Employment and Training Administration administer the grants. Visit dol.gov

### ▶ Corna Kokosing Names New President


Jim Negron

Corna Kokosing Construction Company's (CK) board of directors named Jim Negron president of the Columbus, Ohio-based commercial construction company. Negron most recently served as EVP. "Over the course of nearly 30 years, Negron's leadership has helped build this company into the success it is today," said Lori M. (Burgett) Gillett, CEO of CK. "He has extensive knowledge of the inner workings of the company and has hand-picked our exceptional team. He is the heartbeat of the company and rallies everyone around a shared vision." Negron began his professional career as a foreman, gained experience as a superintendent and division manager, and then held leadership roles as VP and EVP throughout his CK career. Visit corna.com.

### ▶ 80% of Contractors Report Difficulty Finding Qualified Craft Workers

In an industrywide survey released by Autodesk and the Associated General Contractors of America, 80% of the nearly 2,000 survey respondents said they are having difficulty filling hourly craft positions. All four regions of the country are experiencing similarly severe craft worker shortages. Seventy-three percent of firms report it will continue to be hard, or get even harder, to find hourly craft workers over the next 12 months. Forty-five percent say the local pipeline for preparing well-trained and skilled workers is poor. And 26% say the pipeline for finding workers who can pass a drug test is poor. Two-thirds of firms report they have increased base pay rates for craft workers. And 29% report they are providing incentives and bonuses to attract craft workers. Firms are also taking a greater role in developing their own workforce. Forty-six percent report having launched or expanded in-house training programs, and half report getting involved in career building programs. Twenty-nine percent of firms report they are investing in technology to supplement worker duties. One-fourth of firms report they are using cutting-edge solutions, including drones, robots and 3D printers. Meanwhile, 23% of firms report they are taking steps toward lean construction techniques, using tools like building information modeling (BIM) and doing more off-site prefabrication. Even as the industry works to address labor shortages, 44% of firms report they are increasing construction prices, and 29% are putting longer completion times into their bids for new work because of the lack of workers, putting future development and infrastructure projects at risk. Visit agc.org.

**$1.5 MILLION**

*A team of University of California, Los Angeles (UCLA) engineers has received a $1.5 million grant from the National Science Foundation (NSF) to develop 3D-printed concrete that incorporates carbon dioxide into the manufacturing process. The resulting product could have a carbon footprint of 60% less than current products, according to the research team's estimates. Visit nsf.org.*

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# What equipment pain point do you wish manufacturers would fix already?



**ROBERT PREVILLE**
Founder & Chief Executive Officer
*Kwipped*

Businesses frequently prefer, and sometimes even require, the ability to finance equipment. However, the process of progressing from application to underwriting to approval to funding is still predominantly manual and requires a lot of time, effort and resources.

With the technology available to streamline processes and efficiently connect people and organizations, it's surprising that manufacturers have not developed an effective solution to this pain point—especially given the trillion-dollar global equipment financing market.

It would be nice to see manufacturers **use new technology to efficiently and intelligently connect buyers to a competitive network of equipment financing companies.**



**BRENT KUCHYNKA**
Vice President, Corporate Fleet Management
*United Rentals*

As jobsites and projects become more complex, there's increasing opportunity for equipment manufacturers to include even more digital tracking capabilities and integrate with software or management systems—particularly when it comes to field service repairs.

Being able to **monitor equipment conditions for repair and maintenance**, in addition to current telematics capabilities, would **give contractors further visibility into their fleets and help them identify opportunities to improve productivity in real time.**



**JIM ARABIA**
Vice President, Marketing
*BigRentz*

One of the biggest pain points when troubleshooting an equipment problem is **the lack of a common standard for schematics.** Standards vary from Internal Organization for Standardization (ISO) to American National Standards Institute (ANSI) to Deutsches Institut für Normung e.V. (DIN) and others for writing schematics—further complicated when some schematics are drawn as a graphic representation of the location of the parts.

Still, others use a more European approach, in which the schematic is more direct, and a different wiring diagram is used to show the locations of wires and components. Can manufacturers **finally agree on one standard for drawing schematics?** It would make troubleshooting so much easier for users.

**To submit your question,** email Associate Editor Rachel Crosby at rcrosby@cahabamedia.com.




# CONSTRUCTION BUSINESS OWNER ALERT NEWSLETTER

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# How to Keep the Love Alive

## 5 languages of effective client relationship building



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 bestselling 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 construction business owners claim their top priority and primary role is generating, developing and nurturing customers. But most never follow through. In fact, most haven't taken their top five or 10 customers out to lunch or to do an activity in the past year or longer.

Customers are your business's biggest opportunity to grow, make money, win work and build a better future. However, very few, if any, budgets allocate funds to maintaining customer relationships, marketing or sales efforts. Also absent is the investment in cultivating relationships and spending time with targeted customers.

With so much competition in the construction market, clients have their pick from a large selection of general contractors and subcontractors. Most of these options offer great service, quality workmanship, professional supervision, safe worksites, on-time completion and competitive prices.

So why should your clients stay with you instead of seeking a new suitor? The following are five ways to rekindle the love between you and your best clients.

### 1. QUALITY TIME

On a positive note, I know several successful contractors who actually do make client relationships a top priority. They implement proactive development and maintenance programs designed to create loyal clients who regularly hire them and negotiate fairly. As such, their profits have significantly increased. Investing in face time with clients takes only a small amount of time, money and effort to garner a large return.

### 2. WORDS OF AFFIRMATION

Every contractor has a few clients who are reliable and consistently generate a quarter, or even up to half, of the company's recurring business. These people hold the most responsibility for keeping you in your work boots, and it might be a good idea to remind them of that fact from time to time.

Consider sending an email or card to personally thank them for their business. Affirmative outreach like this often encourages clients to return, or at least remember you fondly, when it's time to call in a contractor for their next project.

One of the biggest bang-for-your-buck marketing initiatives is client referrals. Positive word of mouth can drive close client relationships even closer and recruit new clients. If you're able to convert them from one-time clients to repeat clients who use your company regularly, you're golden.

To do this, make a list of your top 20 clients and target clients, ranked in order of annual revenue and profit potential. Consider the ease of doing business with them and the degree to which you want to do business with them, along with the following:



- Loyal clients hire your company, dedicate at least 33% to 50% of their work to you; award the work to you at your price without getting other bids; are open and honest with you about their budget and requirements; work to help you win their jobs; and contribute to maintaining an open, friendly and close relationship.
- Repeat clients are those who hire your company only when you are the lowest bidder, and they do not award work or negotiate with you unless you are the least expensive.

Next, rate the clients based on the potential they have to be converted into longtime customers. Keep in mind that you are working to develop and expand your list of loyal clients, not just repeat clients.

### 3. PHYSICAL TOUCH

Developing customer loyalty requires commitment and consistency—the touchpoints that guide a relationship forward. Remember when you first started dating your significant other? To get to know them, you dedicated your time to talking and having fun together. Because you couldn't wait to be together again, you planned the next date before the current date even ended. Building customer relationships takes the same commitment and contact. Without it, relationships fizzle out and eventually end.

Think of building loyal customer relationships like dating. Without this dedication and face-to-face interaction, there won't be a long-term relationship. As such, you should schedule regular relationship-building activities. For example, invite clients to a ballgame with two of your business associates, employees or peers. Buy a table at the local builder association meeting and invite target clients to sit with you. Efforts like this can keep clients thinking about your performance and dedication, especially when more attractive competitors come calling.

The most loyal customer relationships are built together and occur around in-person activities and meetings, eating meals, attending sporting events, going to community or industry events, etc.

### 4. ACTS OF SERVICE

Clients need to feel your appreciation for them. And actions that go above and beyond help clients recognize your gratitude toward them. The most powerful acts are sometimes the ones that happen spontaneously or without being prompted.

As you get to know one another, you'll recognize the value of working together. Keep consistently delivering special, unexpected efforts. Stop by their offices for a casual chat. Make it a priority to find out about their families, hobbies, common interests and personal goals. It doesn't take much to make note of a client's birthday or recognize their kid's graduation with a greeting card. The key is to commit and follow through. Note that project obligations do not count as acts of service.

And remember: Good relationships require give and take. Be available and attentive, but don't be mistreated.

### 5. GIFTS

To reinforce your relationships, send something to your client list every 2 to 3 months. It doesn't have to be anything extravagant, just a friendly reminder of who you are and the way you conduct business. This will keep your company top-of-mind when clients have a need for your services. Free yourself from the task by delegating the effort to a reliable employee. The task itself requires a thoughtful mind to create a piece of content for your brand—a postcard, job photo, tip guide or article reprint—and a dependable person to package it and drop it by the post office or distribute via email.

Study these five languages and apply them to your client relationships. When you make client relationships a priority, you also help drive their decisions when it comes time for another project. Also keep in mind the two-sided nature of relationships and ask yourself: Would you want to date you? **CBO**

# Why Wait for Doomsday?

## How to prepare for an economic downturn & protect your future



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When is the downturn coming? It's the million-dollar question causing consternation in construction company boardrooms. Whether the next downturn is a depression, recession or simple market correction, there will be ripples experienced across all industries, but perhaps none more than construction. Undoubtedly, the damage from the last recession is burned indelibly in every leader's mind, causing varying levels of anxiety. However, it shouldn't take an economic correction to prompt businesses to shape up. Financial and workforce management, market differentiation and process adherence are surefire ways to absorb any impact and maintain a healthy business.

### FINANCIAL MANAGEMENT

If the Great Recession taught businesses anything, it was the importance of superior financial management, particularly cash flow and collections. Accounts receivable are only good if they generate cash flow in a timely manner. Top firms have a keen eye for collections and adopt a disciplined process for handling risk-prone accounts and customers who slip in the murky waters of 60-days past due.

Additionally, top contractors ensure their cash management through a healthy working capital and ethical, positive overbillings value. This does not mean they lose all semblance of customer service and strong-arm customers, but rather, proactively monitor customer behaviors and ensure managers are doing their jobs. Great leaders should routinely ask themselves:

- What is the age of our average accounts receivable invoice?
- What month-to-month trend do we use to measure client payment reliability?
- Are we cash-flow positive or serving as a no-interest, low-risk lender for customers and clients?

### PEOPLE MANAGEMENT

Another lesson from the Great Recession was that talent development waits for no market. Many organizations decided against investing time or money in talent development, even culling team members who no longer made sense. Employee reductions came about as a necessity, rather than as a routine part of doing business. Additionally, many companies paused training and development because budgets didn't allow for it, and that focus was better applied to work that kept the lights on.

Many business owners and key leaders, now a decade older and wiser, wonder if this pause in training may have stunted the growth of their teams long term. It's important to decide for your business what resources should be cut in order to stave off mediocrity, and what resources should be developed and cultivated no matter what. Some key questions worthy

of reflection on this topic include:

- Do we hold people accountable?
- Are we developing at all levels?
- What skill gaps exist?
- Who are our top performers, and why?
- Who composes our middle tier, and do they regularly receive feedback to improve their performance?

## MARKET DIFFERENTIATION

If your biggest client left you tomorrow, what would you do? Don't panic yet, but many firms experienced this real concern when the economic collapse occurred, leaving them stranded.

First, it is important to constantly examine the current workload and the quality of the future backlog. Examining a rolling, 12-month backlog projection is one way to provide an illustration of what the future holds. Then consider the actions required when specific triggers are hit. For instance, if your firm's backlog 6 months from now is projecting a 12% dip, what steps must you take to hedge against the repercussions? Simply looking at projected billings 30 days out is too myopic and barely provides enough reaction time.

Secondly, a firm can examine peaks and valleys in its backlog relative to market niches or sectors. Private/public, commercial/government, hard-bid/negotiated, etc., are all tranches that provide insight and validation to forecasts. As with any projection, there is some level of variability or uncertainty. Handicapping longer-range targets is one approach. For example, if a strong client has on average 10 opportunities per year and the firm usually wins 50% of those bids, a conservative estimate might project a future backlog of three potential projects for an approximate revenue stream. Questions to consider here include:

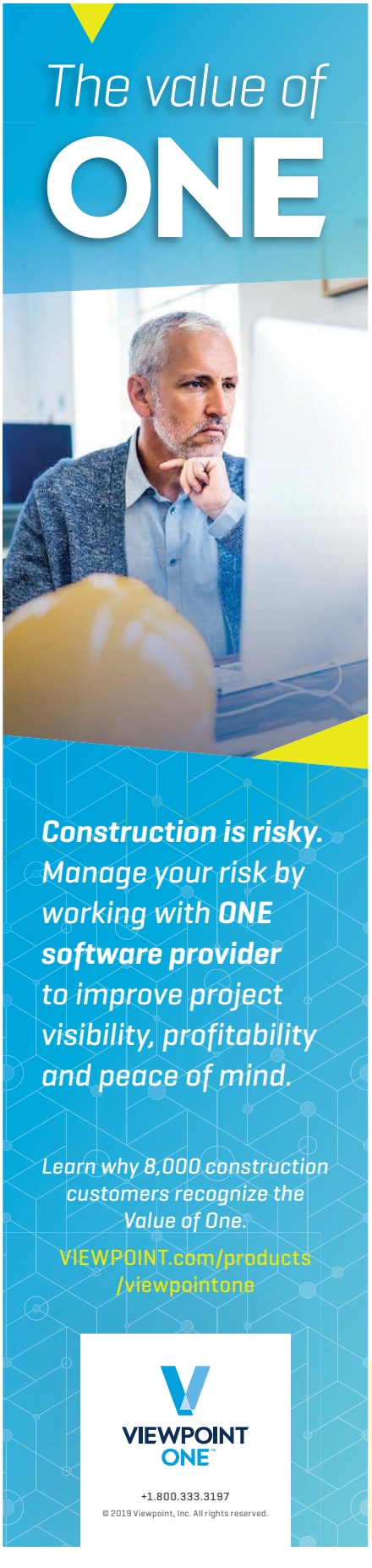
- What would happen to our business if our largest account or source of revenue dropped by 50%?
- What group or individual in our firm is seeking new markets and customers?
- What tools or indicators provide the clearest view into our next 12 months?
- If we can't predict our revenue stream, how are we ensuring we don't have to live hand-to-mouth?

## PROCESS ADHERENCE

Sticking with a set of operational best practices serves a firm well, both when times are challenging and when times are good. Posterity measures along with massive behavioral change create a certain level of organizational inertia that is difficult to overcome, making hunkering down during an economic downturn even harder to apply and enforce.

Performance should be routinely evaluated, and internal processes measured to ensure there is one defined way to do things, and it's the only way accepted. Ponder the following questions to ensure the processes and tools are the right ones used.

- Do we measure efforts like preconstruction planning and closeout planning and provide routine feedback on that process adherence?
- How many different versions of a meeting agenda exist within the firm?
- What is included in the recipe for a successful project, step by step?
- How well do we do at finishing projects expeditiously and profitably?
- Is our current operational model working, or are our processes fractured by too many new ideas?
- Is our current operational model germane to the new business we are doing? CBO

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# Why Mentoring Is a Must

## How to foster career possibilities for your own employees & beyond



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Construction mentorships—what's the need? Construction already has internships and apprenticeships sponsored by schools, unions and other industry groups. And mentorships make more sense in the corporate world, where there is plenty of skill and nuance to gather. But, wait, isn't that also true for construction?

The aerospace juggernaut Boeing Co. is known for its emphasis on peer mentoring and has a "leaders teaching leaders" initiative. And Caterpillar, a major construction equipment manufacturer and vendor of construction-adjacent business, is known for its robust professional development program.

Of course, these are massive companies with large-scale operations, but there are plenty more modest mentorship structures that exist in construction, and they may be more popular than you think.

You may have heard of the ACE Mentor Program of America, which is for high school students interested in architecture, engineering, construction management and/or trades. Another example is the Construction Management Association of America (CMAA), which requires that trainees participate in a mentor-protégé relationship as part of the Construction Manager-in-Training (CMIT) Program.

"One purpose of our CMIT mentorship program," said CMAA Chief Executive Officer Andrea Rutledge, "is to identify goals, mark progress toward those goals and ensure managers in training are getting an opportunity to practice the full range of functions in the construction industry."

Simply put, a mentorship consists of someone with a genuine interest in a new field or in career advancement spending time with a person (or persons) who has more experience and wisdom or knowledge to share and is willing to share what they know.

Of course, mentoring takes time, and that's what tends to stop many older hands from sharing their wisdom. The truth is, though, mentorship doesn't have to take a lot of time. And with the shortage of both skilled laborers and managers in construction—and growing project backlogs—mentorships are needed now more than ever.

As the ACE website puts it, "Who better to inspire a new generation of young people to start careers in an industry than the professionals currently shaping it?"

### THE CATCH

Unfortunately, there's currently a Catch-22 within the industry: construction managers, project managers and experienced tradespeople are aging out of their jobs and need to groom their successors before they leave.

But they (and their experience)—not their deputies or associates—are the ones the property owners want on their projects



to ensure things are finished on time and on budget. It's this pressure, according to Rutledge, that leads seasoned managers to say, "'I can build this wall faster myself than if I teach you how to do it.'"

But Rutledge suggests that mentorships, even for limited amounts of time, can help prepare up-and-comers for the big jobs they're going to have to start heading up. She thinks mentorships should be worked into performance plans for all above-entry-level employees.

Rutledge also suggests that as firms develop a culture of ongoing mentorship, reverse mentoring (higher-ups learning from newbies) will occur more often, too.

## GOT MENTEES?

What's stopping you from mentoring someone seeking a career in construction, whether that person is a high school student or an employee at your company?

Mentoring doesn't require a special certificate. Simply observing someone who is experienced in his/her role can offer a young mentee valuable knowledge. To begin, plot out a clear schedule and cadence, and make sure communication stays rock solid, especially if and when either party needs to reschedule.

Inc. magazine breaks down developing a successful mentorship program into a few key steps: creating a structure, pairing (and re-pairing if necessary), training and, ultimately, evaluating success by establishing and tracking a concrete goal.

Rutledge says the definition of mentor-protégé relationships should be fluid now, as millennials and Gen Xers have different approaches to learning.

"The straight-line 'I am your mentor, so you will learn from me and only me,' isn't quite the model young people are looking for," Rutledge said. "They're interested in having more than one mentor."

As such, sharing your mentoring responsibilities with a colleague or colleagues, through a coteaching setup of sorts, could be an ideal model.

Mentoring isn't just for upper-management positions, either—supers and tradespeople can also benefit from mentoring. Nudging a person, whether he/she is management or part of the field team, to be a mentor is a different ballgame from signing yourself up for a mentorship program.

But you can make it easier by hosting a kickoff event, providing some guidelines for the schedule and agenda, and offering a firsthand account (if you have one) about how rewarding it was to help someone younger or less established get his/her feet on the ground, or to have been helped by someone with more experience.

Tell them to think about the people who may have helped them excel in their career, whether it was part of a formal mentorship or not, and encourage them to share their success as well as their failures.

## TAKING A CUE FROM NAWIC

The National Association of Women in Construction (NAWIC) has a well-known and long-standing voluntary mentorship program, offered through local chapters with guidance from the top levels. The association publishes suggestions on its website for successful mentorship programs at each level.

The document's tenets read as great universal guidelines for how a mentor and mentee should show up for each other so that they can each get the most from the relationship. To view it in full, visit https://bit.ly/2Hxylhg.

"Mentoring has become vital to our chapters in helping each other to connect and grow in the industry by offering a reciprocal, self-directed learning relationship between two individuals who share a common bond," said NAWIC Board Member Angela Highland, who is also a past president of the Orlando, Florida, chapter.

Highland notes that while trade mentorships aren't currently overseen by NAWIC, they are sorely needed and could help more young people—especially women—gain an early foothold in the construction industry.

"If trade professionals could mentor young people and advise them on the possibilities, I think we'd see a turnaround in our industry and fill our ranks with a motivated and innovative workforce." CBO

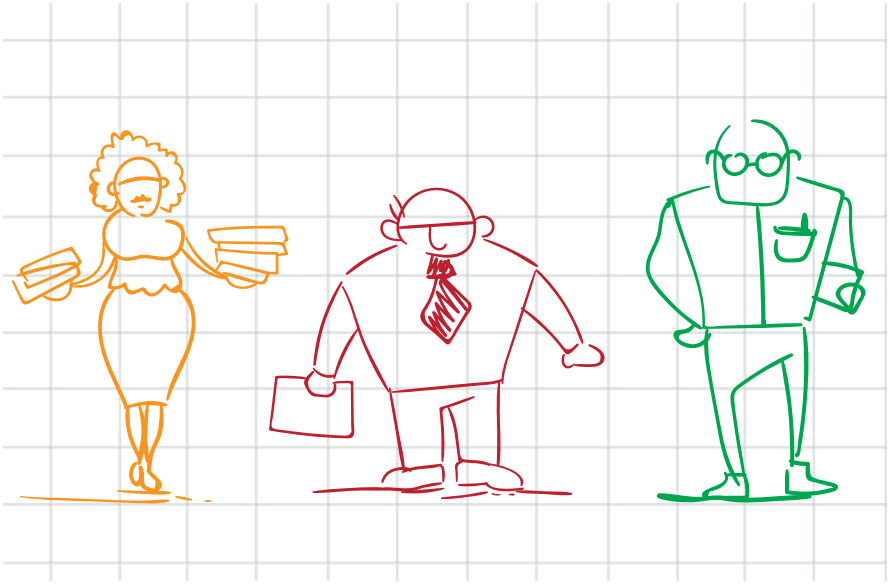
# The Disadvantaged Business Enterprise Program

## Everything you need to know about qualifying, applying, contracts & stipulations

BY VERNON HOWERTON

One of the most discussed and misunderstood arenas of the construction industry is the disadvantaged business enterprises (DBE) program. For those who already participate in the program or wish to own and operate a certified DBE, it is critical to know the history and rules of the system.

Conceived in the 1980s, the DBE program was originally a 10% set-aside (quota) for participation by minority- and woman-owned businesses in federally funded, transportation-related construction projects. The program was intended as a means to remedy past discrimination against women and minorities in the construction industry.



Under the old program, a contractor bidding a $10 million highway project needed to demonstrate $1 million of DBE participation for their bid to be considered responsive. But President Clinton and the Supreme Court changed the game in the late 1990s after Adarand Constructors, a guardrail contractor, submitted the lowest subcontract bid for guardrail on a Colorado highway construction project, but a higher bid was submitted by a DBE subcontractor. The prime took the high bid over the low to meet its quota for DBE participation. Adarand sued and ultimately won in the Supreme Court. In Adarand Constructors Inc. v. Peña, 515 U.S. 200 (1995), the court found the program unconstitutional as then implemented.

The United States Department of Transportation (USDOT) then amended the DBE program under the auspices of "mend, not end," thereby creating the precursor to the current DBE regulations.

### QUALIFYING AS A DBE

Most DBE programs, though implemented by the states via "uniform certification programs," are based on the USDOT's DBE regulations. They can be found in 49 CFR Part 26 at ecfr.gov. To qualify as a DBE, the firm must be at least 51% "owned" and "controlled" by one or more "socially" and "economically" disadvantaged individuals.

### OWNERSHIP & CONTROL

Ownership and control must be real and substantial. Typically, the disadvantaged owner must hold the highest position in the company—president or chief executive officer—and have the ability to control the day-to-day affairs of the business. As a result, generally, the company's bylaws or agreements cannot provide for supermajority voting on issues, such as borrowing money, purchasing equipment,

signing leases and the like.

The disadvantaged owner of 51% of a business cannot and should not agree to a requirement for a 60% majority vote to take certain actions where the 51% ownership is the basis for the DBE certification. On the other hand, if two women each own 30% of a business and each is considered socially and economically disadvantaged, it is acceptable to have a 60% majority requirement for certain transactions.

## SOCIAL & ECONOMIC DISADVANTAGE

Women and minorities are rebuttably presumed to be socially disadvantaged. Economic disadvantage is generally based on the owner's net worth, exclusive of the owner's interest in their primary residence and the value of their interest in the firm that is seeking certification. And the certifying authority must determine disadvantaged status based on the "totality of the circumstances."

## SMALL BUSINESS

To be certified as a DBE, the firm must also be "small," based on either its number of employees or total sales in its primary area of business. Size standards are set and published by the Small Business Administration (SBA) based on the North American Industry Classification System (NAICS) code for the firm's primary area of business.

When the same individuals own or have the ability to control multiple firms, the firms are considered "affiliates," and the total employees/sales are aggregated for purposes of the size determination. Firms that have grown too large to be certified as a DBE can still be certified as woman- or minority-owned.

## KEEP IN MIND

When creating a company that is intended to be certified as a DBE, there are numerous other considerations. For example, the disadvantaged owner must acquire their interest for its value to count (e.g., a husband cannot gift his wife or superintendent 51% of a business, then have it certified). Even where the disadvantaged owner's interest is acquired in exchange for lending their "expertise" to the business, the owner must have a significant financial investment.

In community property states, care must be taken to not acquire the disadvantaged owner's interest in the business with community property. However, a spouse can legally disclaim any interest in the business as community property.

A DBE firm must be independent and not disproportionately dependent on another non-DBE firm. In other words, a heavy highway contractor bidding on public work cannot set up captive DBE subcontractors.

Project DBE goals are no longer considered quotas. Rather, when a project has a DBE "goal," prime contractors bidding on the work must make "good faith efforts" to attain it. If the low bidder can demonstrate good faith efforts through records of advertising, solicitation of DBE bids, outreach and other means listed in the regulations, the project can still be awarded, even where the low bidder did not achieve the DBE participation goal.

Although there is some wiggle room for awarding authorities, prime contractors are no longer required to award a subcontract to a DBE firm just to meet the goal, if the DBE firm's quote is unreasonably high in comparison to other bidders' quotes.

DBE contractors are still required to perform a "commercially useful function." This means the DBE firm must contribute value to the project (i.e., you can't just award a $1 million contract to a DBE who does nothing except be counted as a subcontractor.)

## DEEP INTO THE DETAILS

People who break the rules can go to jail or be fined when they are caught. Anyone who does not believe this should visit the USDOT Office of the Inspector General website (oig.dot.gov) and type "DBE" into the search bar. You will find pages of press releases concerning indictments, prosecutions and fines.

As recently as Feb. 6, 2019, the U.S. Department of Justice (DOJ) announced a settlement related to DBE fraud. "Contractor A," as we'll call them, had graduated from the SBA's 8(a) DBE program and used Contractor B, an allegedly related 8(a) DBE firm, to pursue business. According to the press release, Contractor B used Contractor A's "bonding, office space, employees, contractors, software, computers and vehicles." And Contractor A made high-level decisions and managed the day-to-day operations of Contractor B.

The DOJ alleged Contractor B lacked "control" of its own operations, and the arrangement was intended to defraud the government. The two contractors agreed to pay the government $3.6 million to settle the case.

DBE fraudsters may also find they are subject to suspension or debarment from bidding and receiving new work from governmental entities, as well as subject to civil penalties under the False Claims Act or similar state laws. A good rule of thumb is not to do anything that will potentially put you in jail or ruin your existing business.

Bottom line: Seek legal counsel from an experienced attorney and trust them if they simply say, "No, don't apply." CBO

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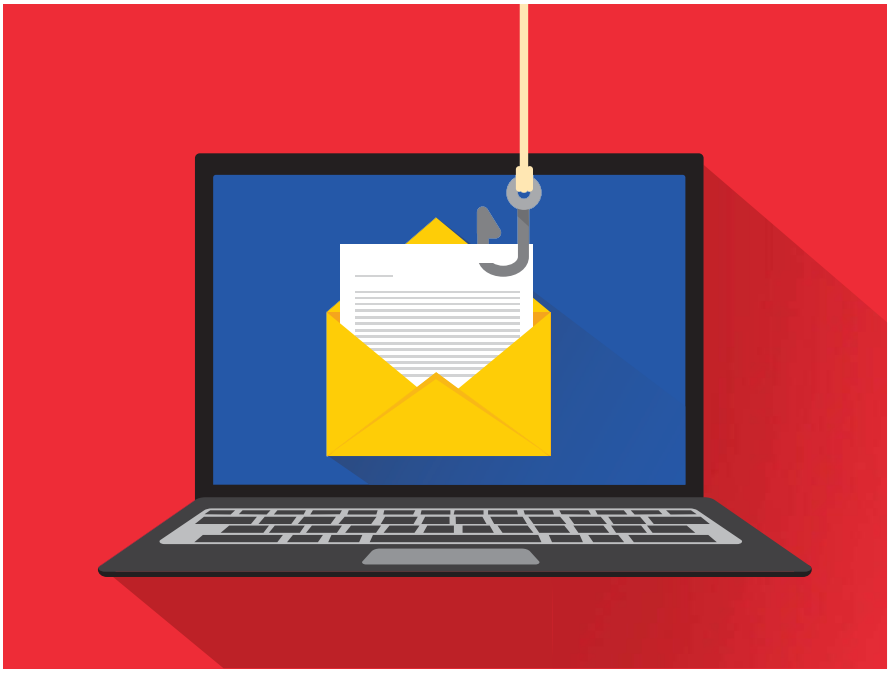


# Dissection of a Phishing Attack

## How to identify, spot & prevent costly cybercrime at your company

BY SCOTT LEWIS

In today's connected world, there is a need for collaborative software and services, but these resources could be exposing you to phishing attacks. Couple the need for collaboration with the need for immediate access to data, then add the human factor, and you have all the dynamics for a robust phishing attack. The following are different types of phishing scenarios and how they each target specific people and processes.



- *Spear phishing*—A targeted attack on a group of emails that were harvested via social media or email lists that were purchased through trade shows, conferences, online newsletters or other organizations and companies—these addresses were supplied by the address-holder when they signed up for a service of some kind and provided their email address
- *Whaling*—A focused email attack, typically on high-profile individuals, which could include C-suite individuals, such as chief financial officers, chief information officers or chief operating officers
- *Smishing*—An attack via short message service (SMS) focused primarily on mobile devices and conducted via text messaging
- *Content injection phishing*—An attack in which phishers insert malicious code or misleading information into emails or websites, encouraging people to input user credentials and password information or perform other activities, such as transfer of funds
- *Man-in-the-middle phishing*—An attack in which phishers position themselves between the legitimate websites people use, such as social sites or banking sites, and is difficult to detect because it typically continues the transaction and does not create any disruptions

### GETTING STARTED

So, how can you start a plan to protect yourself and your business? According to Gillware's data recovery and digital forensics experts, the following are some primary steps to take.

- *Consider compliance*—In almost every industry, there are federal and state compliance measures that you have to consider. Regulations like General Data Protection Regulation (GDPR), which is already in effect, applies to any company that processes individual

data of European Union citizens, even if the citizens live in the United States.

- *Create an incident response plan*—The incident response plan should outline how your company is going to respond in the event that a breach is suspected or confirmed. The program should describe the roles and responsibilities of senior executives because they will likely be the point of contact for coordination and information dissemination. Who will talk to the press (if necessary)? Who will be responsible for the collection or remediation processes and damage control? Your response plan can also outline how those remediation and confirmation steps are going to be addressed and implemented.
- *Use blockchain and artificial intelligence*—Consider ways to make yourself less of a natural target. You can do this by keeping your security devices and software up to date. With scammers using increasingly intelligent and speedy methods to gain access, using artificial intelligence (AI) to look for patterns and analyze risks is becoming more and more critical to overcome emerging threats. For instance, Bandura's Threat Intelligence Gateways, which block known internet protocol (IP) and domain threats, is a good example of how AI can bolster your security.
- *Protect your email system*—Email systems continue to be the favorite spot for phishing attacks and other viruses, such as cryptoviruses and ransomware, along with a multitude of other malware. In systems like the Microsoft Office 365 E5 plan, users can take advantage of the anti-phishing option in the security and compliance center, with instructions in the user portal on how to configure for your application. In-house systems also have many tools to choose from—companies like Symantec, Barracuda and many others offer advanced phishing detection and prevention features. Remember: No single device will protect you. Security is a layered approach with many nets to trap the emerging threats.
- *Stop data breaches before they start*—This begins with good employee policies and ongoing training for employees to identify those who may be more susceptible to phishing and security attempts. Also be proactive in keeping your systems up to date.

## SPOTTING A SCAM

When you have updated systems, new firewalls, advanced threat detection and antivirus protection in place, but you still become a victim of a phishing scam, you're left to wonder, "How can this be happening?" According to Protected Trust, cloud security and productivity company, here are some things you can watch for:

- *Are you familiar with the sending address?*—Take the time and read the email address. One way to help spot small subtle changes is to read the email address backward. It might sound funny, but it makes your brain stop and think about what you are reading, instead of using the human condition to understand what it expects to see. Other questions to ask: Do you know this person? Have you ever exchanged emails with them before? Are they asking you to do something that is outside of the norm or expected? If it seems fishy, then don't hit "Reply" or "Reply All," but type the actual body of the email in the "To" or "CC" field.
- *Are there misspellings?*—Several spelling errors in the email address and the body of the email are warning signs. Turn on spell check to ensure that the message is highlighting these spelling errors.
- *Is there a high sense of urgency?*—If the sender is insisting that you have to act now, this elevated sense of urgency should be a red flag. Remember: The lifespan of a phishing site is only 15 hours, so things must happen quickly.
- *Is the scammer trying to direct you to a new URL?*—If the message says, "Visit this link and input your username and password," it's a red flag. Instead of clicking on the link, use Google to look up the URL. You can also hover your mouse over the link, and it will show you the fully qualified address of where you would be directed if you clicked on it. On mobile devices, you can use a light touch to see the fully qualified address. The risk here is that if you press too hard, you will be directed to the phishing site. Always remember that your bank, the Internal Revenue Service and other government agencies will not contact you directly via email.
- *Does the URL feature a closed lock?*—Make sure that the URL line features the image of a closed lock or begins with "https://." Specifically, the "s" indicates this is a secured website. Also, your browser may put a circle with a red "x" or hash sign through unsecure URLs.

All of these steps are important; however, the real weakness is in human conditioning. As such, it is essential to communicate and train employees on the risks of phishing, how it happens and what they can do to be aware of the dangers. Several products allow you to test your employees with fake phishing attempts. These will help you identify who within your employee base is likely to fall prey. **CBO**

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# Inclusive Values & the Construction Ecosystem

## How Hensel Phelps supports diversity & women in the workforce

BY LORIEN BARLOW

As the filmmaker behind an upcoming documentary about women breaking down gender barriers in the construction trades, I am excited by efforts that support this line of thought. Recently, I sat down with Mike Choutka, president and chief executive officer (CEO) at Hensel Phelps, general contracting and construction management company, to talk about the practices that have earned the company the Associated Builders and Contractors (ABC) National Diversity Excellence Award 7 of the past 8 years. Read on for Choutka's comments.



**LB:** You were recently appointed CEO at Hensel Phelps. What are some of the positions you held along the way, and what would you say makes Hensel Phelps a special company?

**MC:** My first role was field engineer, which is still where our new hires begin their careers today. Hensel Phelps has always developed people to be "builders" by starting them in the field and teaching them how to support the tradesmen and tradeswomen who build the projects.

**LB:** Diversity is often an idea that starts and ends with quotas and hiring goals, leaving minorities feeling isolated and marginalized. How have you approached this challenge?

**MC:** For inclusion to happen, we recognized the need to sponsor networking opportunities and provide a conduit to corporate leadership. So, we developed our personnel advisory team, a group made up of employees from a variety of ethnic and racial backgrounds, and fostered leadership networks, such as our Women's Network, which was created specifically to support our employees and maintain morale and community ties through mentoring, outreach and advancement-related efforts.

**LB:** One of the biggest challenges in sustaining commitments to diversity and inclusion is that every project has so many rotating players and moving parts. Can you say more about your work with minority trade partners?

**MC:** You have to invest in building and maintaining partnerships based on those values. For example, our Technical Assistance Program is conducted annually by our supplier diversity, procurement and operations teams. This program provides training for our diverse trade partners on

how to be successful on Hensel Phelps projects—or any project for that matter. It is a full-day commitment that covers core topics, such as business development, estimating, schedule and workforce analysis, safety planning, and quality control.

Hensel Phelps's Emerging Trade Partners Program is another program focused on engaging small and diverse trade partners that are opportunity-ready but have not worked with us. It is a 2-year commitment, and participants of the program receive one-on-one business development and project support to build relationships with estimators and project team members and to communicate best practices.

Another capacity building program we have in place is our Head Start Bonding Program. We recognize that bonding remains a major barrier for small and diverse trade partners, precluding many from participating in a significant role on larger projects. To alleviate this barrier, Hensel Phelps entered into an exclusive agreement with The Barbour Group LLC, a surety agent and woman-owned business, and RLI Corporation, a surety company, to provide construction bonds to small and diverse trade partners.

We recently held a Trade Partner Forum to promote the continued success of our minority- and women-owned trade partners. The purpose of this 1-day forum was to gather feedback from both our operations team and our small, diverse trade partners about the benefits, challenges and growth opportunities of these programs.

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**LB:** Everything you've described is an investment of time, energy and resources. What's the motivation for companies?
**MC:** One word: growth. Hensel Phelps has experienced rapid growth in technology advancement, education and leadership training, and, of course, revenue. It's no secret that the more diverse ideas you have in a room, the more successful your decisions and solutions are going to be. It's a smart business decision, but at the end of the day, it is the right thing to do.

Our industry is also growing. There are huge benefits for companies to invest in the women and minorities who have been traditionally underserved in our industry. Construction is rapidly changing due to technology and a changing view of how to treat your employees. I believe the firms that evolve with both will be the most successful over time.

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**LB:** As a tradeswoman advocate, I try to emphasize to companies the importance of having women in supervisory roles on the jobsite. Can you say more about why Hensel Phelps made this commitment and what that process has been like?
**MC:** Though still low, the number of women in supervisory roles in construction has been on a steady rise for the past 10 years—currently over 9% of the industry workforce. Hensel Phelps is proud that 15.7% of our team members are women, and that percentage is growing every year. The project staff on one of our signature projects in Bethesda, Maryland, is 50% women, and more and more of our projects are following suit.

It is really hard to change the culture of the industry without trailblazers. Making a push for more female superintendents is a natural progression of diversity and inclusion, but it doesn't happen without some amazing and talented women who are committed to leading the way. Ours has been a long process that began many years ago as a result of the Women's Network and our Women's Leadership Seminar (WLS). The seminar, held every other year with women from across the country, has grown from just a handful of employees to over 400 women strong this last year. In addition to these internal programs, we actively support and encourage participation in external organizations that support women in construction, such as National Association of Women in Construction (NAWIC) and Women in Construction Operations (WiOPS).

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**LB:** Hensel Phelps recently became a "Hard Hatted Woman" sponsor. How and why did you choose to support the film?
**MC:** Last year, at our WLS event, the women of Hensel Phelps organized a 5K race as a fundraiser, with 100% of the proceeds benefiting "Hard Hatted Woman." These proceeds came out of their own pockets, so I immediately wanted to understand what our employees were so passionate about. We sponsored "Hard Hatted Woman" because we have similar visions for the future of the industry. There is currently a 500,000-person void in the craft profession. We believe that by providing education and real, one-on-one experiences surrounding the trade professions, we will help young women identify these opportunities and feel excited to be part of the industry.

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**LB:** Has investing in people created a company culture where diversity and inclusion work can really succeed?
**MC:** In 85 years of business, we have always invested in our No. 1 priority—our people. By doing so, we are ultimately investing in our company and securing its future. And as our people become more diverse, so will our leadership development, education and training programs. Our culture and what we invest in our employees' futures are what set us apart, and it's why people stay with us as long as they do. **CBO**

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*Lorien Barlow is the director-producer of "Hard Hatted Woman," a documentary film about women breaking down gender barriers in the construction trades, due to premiere in 2020. Contact Barlow at lbarlow@hardhattedwoman.com. Visit hardhattedwoman.com.*



A SPECIAL ADVERTISING SECTION

# 2019 CORPORATE CAPABILITIES

In order to succeed in this industry, continuity and credibility must ring true for your company. With economists forecasting a recession in the next year, it's imperative that the tools you use every day on your jobsites and in the back office deliver on their promises, so you can continue to work efficiently and profitably. And that's what the companies in this section aim to do. The products and services on these pages are built to last and designed to help your company succeed. Simply put, they are here to help you establish a line of continuity for your business, regardless of what's on the horizon.

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# Acumatica Construction Edition

*Eliminate silos, improve collaboration & increase project success*

When individual employees or entire departments don't have the right tools to share information and knowledge with each other—or they simply don't want to—organizational silos occur. Silos can impede communication and collaboration, both of which are essential to providing smooth customer experiences and delivering construction projects on time and on budget. Siloed teams often end up working in isolation, leading to various internal and external problems for employees, subcontractors and customers.

When systems are siloed, business processes become more complex than they should be. For example, if you need to pull reports from multiple systems to collate them into one single report, you're not only wasting time, but you're also leaving your business vulnerable to costly errors.

## CONNECTED CLOUD PROVIDES COMPLETE VISIBILITY

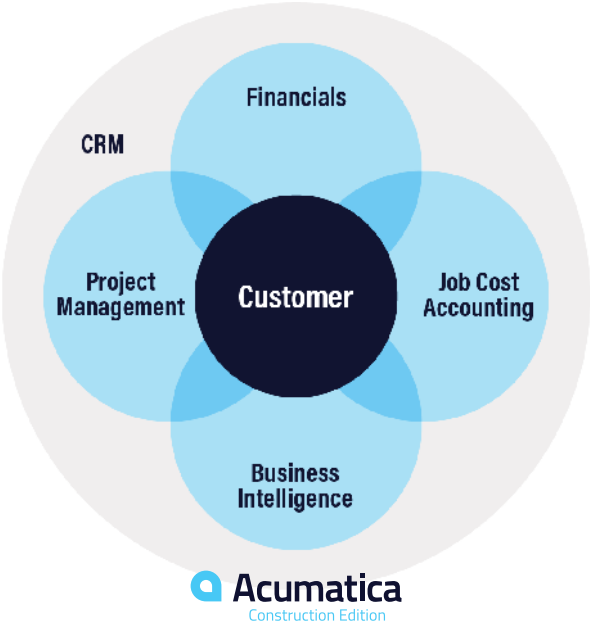
Cloud technology gives you an end-to-end solution in which everyone from management and field operations to the back office is connected and has complete visibility into your business and your customers.

A connected cloud application can streamline the exchange of information between your teams in the office and out on jobsites. When someone uses a mobile app to make changes to items, such as RFIs, project issues or timecards, the system will automatically update and sync this data in the cloud construction accounting application. When your entire workforce has access to the same information at the same time, you can be sure that important issues will be addressed immediately—before they cause costly delays.

## PUTTING YOUR CUSTOMER AT THE CENTER OF YOUR BUSINESS

When information lives in multiple disconnected applications, it's almost impossible for construction firms to provide a seamless customer experience. There are few things more frustrating to a busy construction professional than using software that doesn't provide a single customer view or real-time insights. Unfortunately, most customer experience teams have no way to arrive at a single customer view. Without this, they can't fully understand each customer and provide them with a personalized experience.

A connected cloud solution means everyone from management, field operations and the back office has complete visibility into customers and your business in one connected application—with an open architecture that allows you to connect to other mission-critical applications. This means you can put your customer at the center of your business. From budgets, tracking project progress, document control and project management to productivity, employee utilization and daily site operations, cloud construction accounting software covers every team member's needs. This collaborative and holistic approach allows every team member to understand his/her role within the organization and deliver successful projects. Through technology, construction companies can finally bring all of their teams together.




## REVOLUTIONIZE YOUR BUSINESS, REAP MORE PROFITS

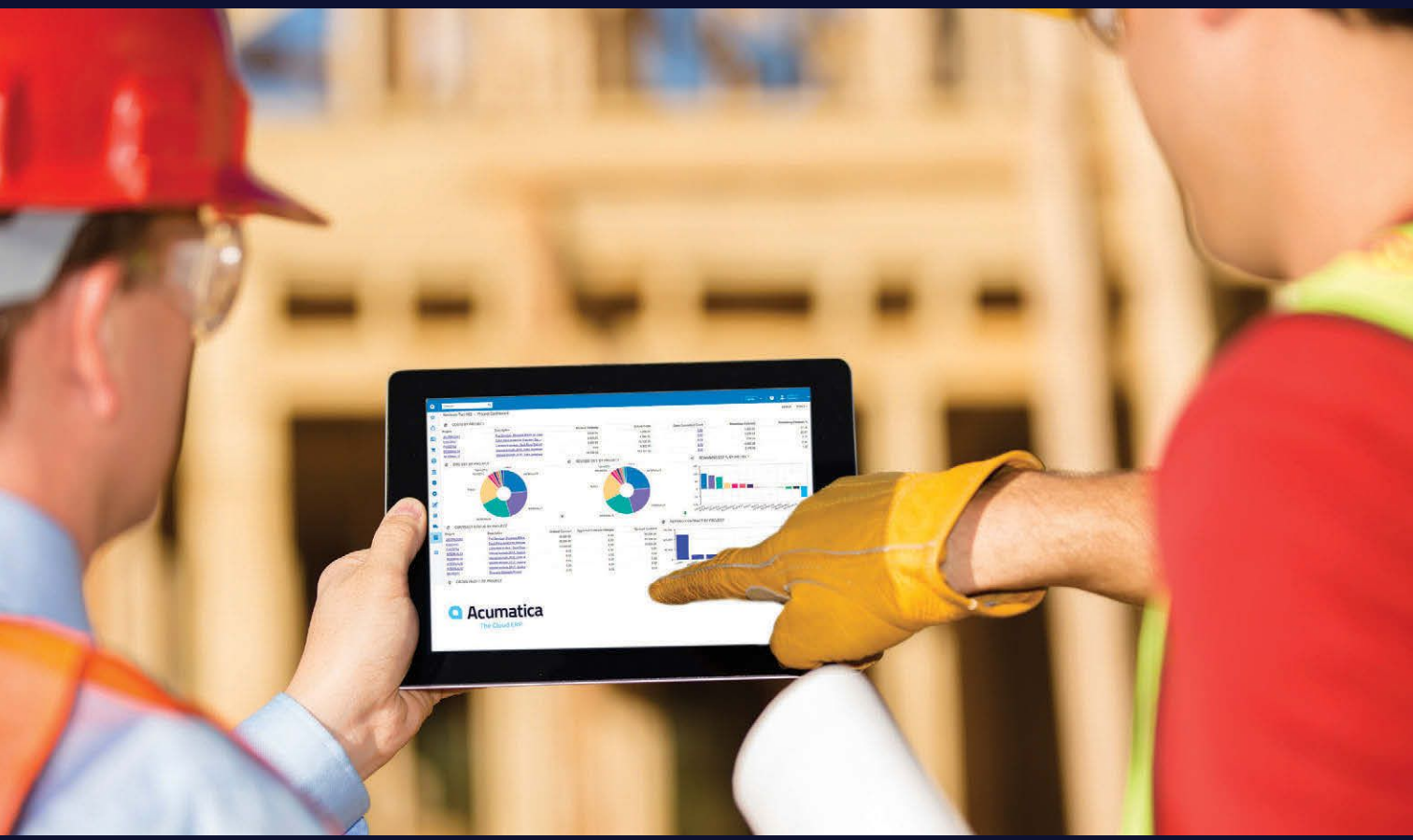
True cloud construction accounting software can eliminate worry over infrastructure while seamlessly integrating front- and back-office needs. Data and application silos disappear, and the entire operation is brought together with a single source of truth.

With the availability of cloud construction software, such as Acumatica Construction Edition, construction companies can revolutionize how they do business and reap the profits.

**Acumatica Construction Edition**
**888-228-8300**
**acumatica.com/construction**

Acumatica
Construction Edition

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Acumatica Construction Edition's true cloud software lets unlimited field and office staff connect to your business anytime, anywhere. That means better decisions, smoother projects—and bigger profits.

Accounting | Project Management | Field Management | CRM | Mobile

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888-228-8300

# AIA Contract Documents

*An industry standard in project contracts*

Professionals in the construction industry nationwide use the American Institute of Architect's (AIA) contract documents. With the input of owners, contractors, attorneys, architects and engineers, these 200+ forms and contracts define the relationships and terms involved in design and construction projects. AIA Contract Documents save professionals time and money by preventing contract disputes between project team members and cutting down on attorney's fees.




## SAVE TIME

When AIA develops and revises documents, an expert team of construction attorneys works with construction and design professionals and insurance experts to ensure AIA documents reflect the shared interests of the industry at large. With over 200 custom templates, simply choose the contract that fits the project need and start contract negotiations sooner. Popular timesaving contracts are:

- *A101-2017 Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum*—To make large projects easier to plan and manage, this document is designed for use with A201-2017, General Conditions of the Contract for Construction.
- *A201-2017 General Conditions of the Contract for Construction*—This "umbrella" document for design-bid-build projects detail the rights, responsibilities and relationships of the owner, contractor and architect.
- *A401-2017 Standard Form of Agreement Between Contractor and Subcontractor*—This document establishes the duties and responsibilities of the contractor and the subcontractor.
- *G701-2017 Change Order*—G701 makes documenting changes in the work agreed to by the owner, contractor and architect easy. Execution of a completed G701 indicates all parties agree to the new terms.

## SAVE MONEY

On average, an attorney will charge between $150 and $500 an hour, and it might cost as much as $5,000 to write a construction contract. Drafting, editing and consulting to produce a contract could rack up numerous hours—especially for a large, multi-party project. Using a standardized AIA contract is considerably less expensive than starting from scratch with an attorney or having to deal with a potential lawsuit.

## PRODUCT OPTIONS

AIA Contract Documents' online service allows contracts and forms to be purchased, edited and finalized online. There are two online service product options: customizable single document or unlimited-use, 1-year access. Both products allow edits to the document's legal language, share and track changes, a custom clause library, and the ability to create custom document templates. The difference is that while both versions allow unlimited drafts, a customizable single document can only be finalized once.

## DOCUMENTS EDUCATION

With over 200 AIA documents and ongoing updates to the online service, aiacontracts.org/learn offers a variety of high-quality education, essential AIA contract resources and relevant articles. Many of the resources are free, and they can be accessed by both customers and non-customers alike. Visit aiacontracts.org/learn to register for upcoming webinars and learn more about AIA document education.

**AIA Contract Documents**
**800-942-7732**
**aiacontractdocs@aia.org**
**aiacontracts.org**

**AIA** Contract Documents

# Real projects start with the industry standard

Before they broke ground, LEO A DALY used AIA contracts to help manage the large and complex **Louis Armstrong New Orleans International Airport** project.

**AIA Contract Documents used:** C401–Architect/Consultant Agreement.

**Learn more about the project at aiacontracts.org/cbo-nola-airport**




© LEO A DALY/Atkins

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# Alliance Tire Group

*More than 50 years of application-specific, purpose-built tires*

Construction business owners have relied on Galaxy tires for more than 50 years. Galaxy tires have proven themselves on the jobsite to be more than just rugged and reliable—they also continually deliver an outstanding return on investment.

Over the years, Galaxy has led the way on innovative tread patterns and productive features, purpose-built for the real-world challenges construction crews face on the job. That includes tread patterns and special compounds for mud, rock, pavement and other rough environments. And with its growing Severe Duty Solid (SDS) and Radial OTR lineups—including new skid steer radials—the Galaxy brand continues to offer new tools to the construction industry.

Galaxy is a brand of Alliance Tire Group (ATG), a global leader in off-the-road (OTR) and industrial tires with more than 2,000 patterns and sizes. That ensures construction professionals can select the optimum tire for their equipment, conditions and budget.




## LOW COST PER HOUR

"The Galaxy brand stands for the combination of premium technology and everyday affordability," said Brian Sheehey, vice president of marketing for Alliance Tire Americas. "Galaxy tires provide low cost per hour and high return on investment to construction business owners. It's a powerful combination."

"There's no such thing as one-size-fits-all construction projects, so it makes sense that there's no such thing as one-size-fits-all construction tires," Sheehey said. "Whether it's traction in mud or scrub resistance on pavement, Galaxy delivers tires purpose-built for the challenge. That gives construction professionals the right tool for the job."

## SKID STEER RADIALS

Galaxy skid steer radials are gaining traction in the market with their large, even footprints, great traction, and longer service life.

The Galaxy Radial OTR lineup is also available for loaders, dozers, graders, articulated dump trucks and forklifts, and new sizes are in development.

## PNEUMATIC & SOLIDS

The growing line of Galaxy SDS solid tires delivers more options than ever for construction operations where puncture is a constant threat and downtime isn't an option.

The SDS line reflects some of the best design options for construction use, including solid versions of the Beefy Baby bar tread, the massive tread blocks of the Hulk, traction OTR and smooth designs. Available with apertures for operator comfort or completely solid for extra durability, Galaxy SDS tires are retreadable for even longer life.

## GLOBAL NETWORK

ATG's three manufacturing facilities ensure that every one of its tires—whether the Alliance, Galaxy or Primex brand—meets the company's exacting standards for quality and reliability. Every element in ATG's tires, from the ingredients in the compound to the wire in the bead bundles to the rugged belts beneath the tread, delivers performance and value.

**Alliance Tire Americas**
**800-343-3276**
**bclifford@atgtire.com**
**atgtire.com**

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# BETTER PERFORMANCE.

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**Ask your tire dealer about the Alliance MultiUse 550, visit www.atgtire.com or call the Alliance Tire Group (ATG) at (800) 343-3276.**

ATG BETTER VALUE. SMARTER CHOICE.

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Check 102 on index.

# Bobcat Company

*Great performance & comfort in one easy-to-use machine*

Based in West Fargo, North Dakota, Bobcat Company leads the industry in the design, manufacture, marketing and distribution of compact equipment. Bobcat has more than 900 dealers located in more than 100 countries, providing compact equipment throughout the world.




## HISTORY

In the 1950s, brothers Cyril and Louis Keller, at the request of a local farmer, built a three-wheeled loader with two drive wheels in the front and a caster wheel in the rear to help clean barns—the precursor to the modern skid steer loader. The loader came to the attention of Melroe Manufacturing Company, which invited the Kellers to demonstrate their invention at the Minnesota State Fair in 1958. The Melroes purchased the rights to the machine and hired the Keller brothers to refine the design and put the machine into production. To improve the design of the loader, a second set of drive wheels was added to the back of the loader in 1960. With this four-wheel drive, the M400 became the world's first true skid steer loader. "Skid steer" describes the unique steering system, which enables the machine to turn within its own length. Today, nearly one out of every two skid steer loaders is a Bobcat machine.

## CURRENT OWNERSHIP

Melroe Manufacturing Company (later changed to Bobcat Company) was purchased by Clark Equipment Company in 1969. Clark was bought by Ingersoll Rand in 1995. In 2007, Doosan Infracore acquired Bobcat Company. Doosan Infracore includes Doosan Bobcat North America, which oversees sales of Doosan construction equipment, Bobcat compact equipment and Doosan portable power products. Doosan Infracore is owned by Doosan Corporation.

## NEW PRODUCT OFFERINGS

The R-Series excavator line was originally launched in 2017. The first two excavators in the new generation were the E32 and E35 in the popular 3- to 4-ton size class. To date, the lineup now includes the E10, E20, E26 and E85 compact excavators. In September 2019, the E145 was introduced as the largest excavator in the R-Series lineup. R-Series excavators feature a bold, distinct design and impressive performance. In every R-Series excavator, operators experience excellent ride quality, high-quality finish and a comfortable cab.

In September 2019, Bobcat Company announced the launch of a new compact tractor lineup. This includes 15 models ranging from 21 horsepower to 58 horsepower to ensure customers have the right machine for the work they want to accomplish. The Bobcat compact tractor line provides great performance and comfort all in an easy-to-use machine—serving homeowners with acreage, grounds maintenance and landscaping professionals.

## PRODUCT LINES

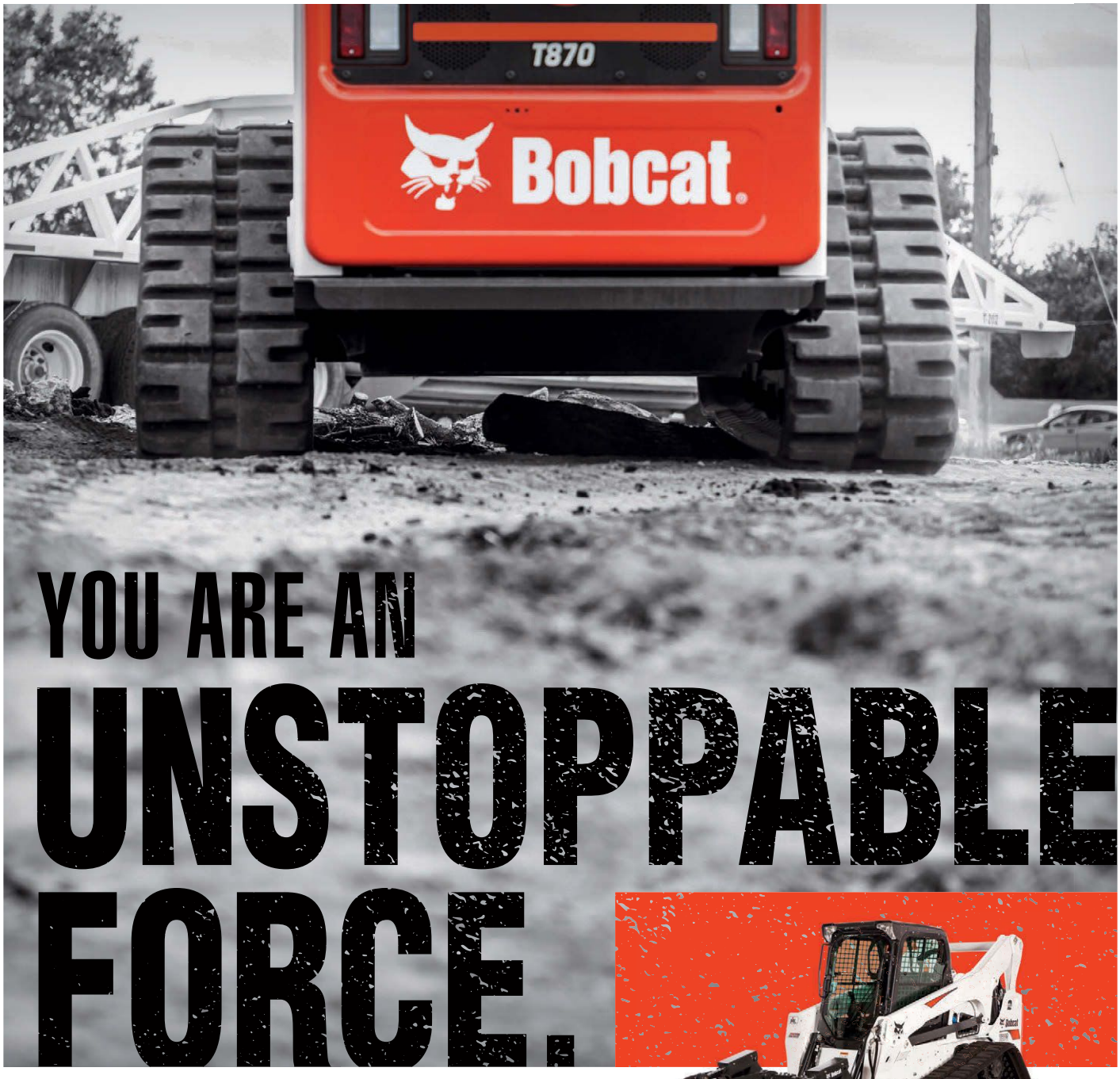
- All-wheel steer loader: One model; Bobcat-exclusive product
- Compact excavators: 12 models
- Compact track loaders: Nine models
- Compact tractors: 15 models
- Attachments: More than 450 front-end models and three-point implements
- Mini track loaders: Two models
- Skid steer loaders: 11 models; Bobcat-invented product
- Toolcat utility work machines: Two models; Bobcat-exclusive product
- Utility vehicles: Four models
- VersaHANDLER telescopic tool carriers: Two models

## MARKET SEGMENTS SERVED

- Agriculture
- Construction
- Grounds maintenance
- Industrial
- Landscaping
- Personal use
- Rental

**Bobcat Company**
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**Bobcat is a Doosan company.** Doosan is a global leader in construction equipment, power and water solutions, engines, and engineering, proudly serving customers and communities for more than a century.
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# Doosan Infracore North America LLC

*Providing unmatched dedication to service & customer uptime & durable, reliable products*

Doosan Infracore North America LLC is a stand-alone entity of Doosan Infracore, a global leader in the infrastructure support business. Founded in 1896, Doosan is a strong, stable and global company with a long legacy in infrastructure support. Its history in equipment manufacturing began in 1937. More than 80 years later, Doosan has grown to become the fifth-largest construction equipment manufacturer in the world.

Doosan equipment includes a full range of crawler excavators, wheel excavators, mini excavators, log loaders, material handlers, wheel loaders and articulated dump trucks. In 2019, Doosan expanded its mini excavator lineup with the addition of three new models—the DX35-5, DX42-5 and DX50-5. Doosan also added another crawler excavator to its lineup—the DX170LC-5.




## HEAVY-DUTY DESIGN

Doosan crawler excavators provide exceptional performance, operator-focused comfort, fuel efficiency, unmatched reliability and durability. Crawler excavators are equipped for nearly any digging, lifting and loading application, including roadways, major construction projects, mass excavation, heavy-duty mining, scrap handling and more. Most models feature a long carriage (LC) design that optimizes performance in heavy digging and lifting operations. Options include additional counterweight and boom and arm lengths, including a super-long-reach option on some models.

## LIFT & CARRY SPECIALISTS

Doosan wheel loaders are dependable machines that lift, carry and dump materials on construction jobsites. Doosan wheel loaders are designed with cab comforts, such as an adjustable steering column to provide more legroom, easy-to-operate controls and more floor space. A fuel consumption gauge informs operators how much fuel the machine is using in real time. Updates to the keypad on the dashboard make it easier for operators to review, adjust settings and clean and maintain it. Overall visibility within the cab and around the machine has been improved, too.

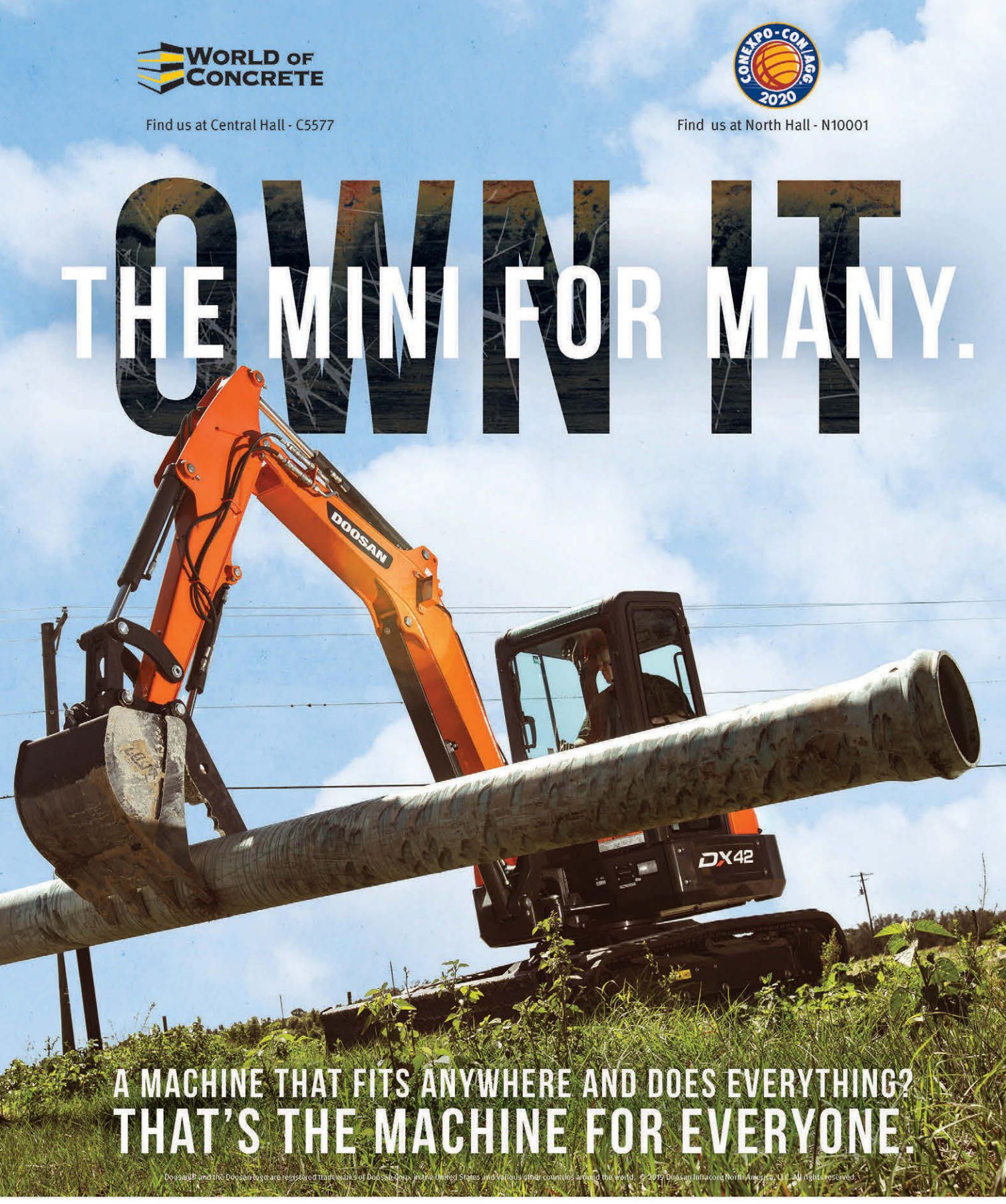
## 150+ DEALERSHIPS

Doosan construction equipment is marketed through more than 150 dealerships throughout the United States and Canada. The company services its dealer network from its headquarters in Suwanee, Georgia. It has parts distribution centers in the Atlanta, Georgia, and Seattle, Washington, areas for parts support within the U.S. and Canada. At a facility near Tucson, Arizona, called The Real Operation Center (The ROC), dealers and sales specialists learn about new equipment, and equipment owners can perform hands-on testing of Doosan machines.

## MARKETS

- Construction
- Forestry
- Mining and quarries
- Recycling and scrap processing
- Utilities

**Doosan Infracore North America LLC**
**678-714-6000**
**doosansalesandmarketing@doosan.com**
**doosanequipment.com**




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DOOSAN®

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# Express Blower Inc.

*Selling a business, not just a piece of equipment*

For 25 years, Express Blower Inc. (EB) has been leading the pneumatic blower truck market through innovation, state-of-the-art systems and practical experience, resulting in a greater number of large-size pneumatic blower machines working in the field than any other manufacturer. The mantra, "We are selling a business, not just a piece of equipment," is ingrained in Express Blower's culture and is reflected in the equipment and customer service provided to its customers.



## EQUIPMENT TO MEET EVERY NEED

What began as a bark or mulch blower has given way to a variety of Express Blower machines, some of which are powerful enough to productively blow aggregates as large as 1.5-inch round rock more than 1,850 feet and compost and soil blends more than 2,000 feet*. When including the available power packages, EB now offers eight models, plus two more through Express Mulcher, an EB product line that features the walking floor and hose reel for companies interested in a more economical machine strictly for mulches and wood-chip applications.

## SEEDING IS BELIEVING

The Supplemental Injection system, the basis for the Terraseeding application, was patented in 2000 and is the design that quickly gave customers the most profit potential. Descriptively called "seeding with soil," Terraseeding is a calibrated system to inject grass or wildflower seeds into the blow stream of compost, soil blends or mulches. The calibration provides an even distribution of seed with the added benefit that blowing in with the organic material increases and quickens seed germination. The process also eliminates many steps, such as wheelbarrowing soil, leveling and raking, seeding by hand, fertilizing and topdressing over the seed. The blown-on application is swiftly completed in relation to other methods and leaves little to no damage to existing landscapes.

## A GREEN MACHINE

Express Blower machines quickly, and with little labor, install compost erosion control blankets or sediment control berms, each delivering 100% ground contact for greater success at controlling runoff and stabilizing slopes—not only providing another revenue stream, but also extending the blowing season into the fall and winter months.

With the rising popularity of green roofs, Express Blower again saw an opening to create more demand for its equipment and increase business opportunities for its customers by developing machines with the ability to blow materials "sky high." While all EB machine models can go vertical for green roof installations, certain models have blown rooftop soil mixes more than 30 stories high, eliminating the need for cranes, wheelbarrows and manlifts, while decreasing the amount of labor needed for installation.

## THE COMPANY

Express Blower claims some of the industry's most experienced and knowledgeable people in both sales and aftermarket product support and takes great pride in its superior customer service. Personalized on-site training with purchase, exclusive EB owner's educational conference, expert technical support, extensive parts inventory to maximize uptime and productivity, and exceptional warranty coverage are just a few of the reasons EB continues to grow its customer base.

*Performance may vary depending on type and quality of material used, operator proficiency, and jobsite setup, requirements and specifications.

**Express Blower Inc.**
**800-285-7227**
**info@expressblower.com**
**expressblower.com**



Express Blower

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# YOU NEED MORE MACHINE

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- Erosion Control Blankets/Berms
- Terraseeding®/Topdressing
- Landscape Mulching
- Playground Chips Installation
- Animal Bedding & Mud Control

Whether you are looking to increase your current green business' profitability and productivity, or you are an entrepreneur looking for an opportunity to capitalize in an emerging market, Express Blower, Inc. has the expertise and equipment to help you realize your vision. We are the INVENTOR, the INNOVATOR, the STANDARD. Call us.

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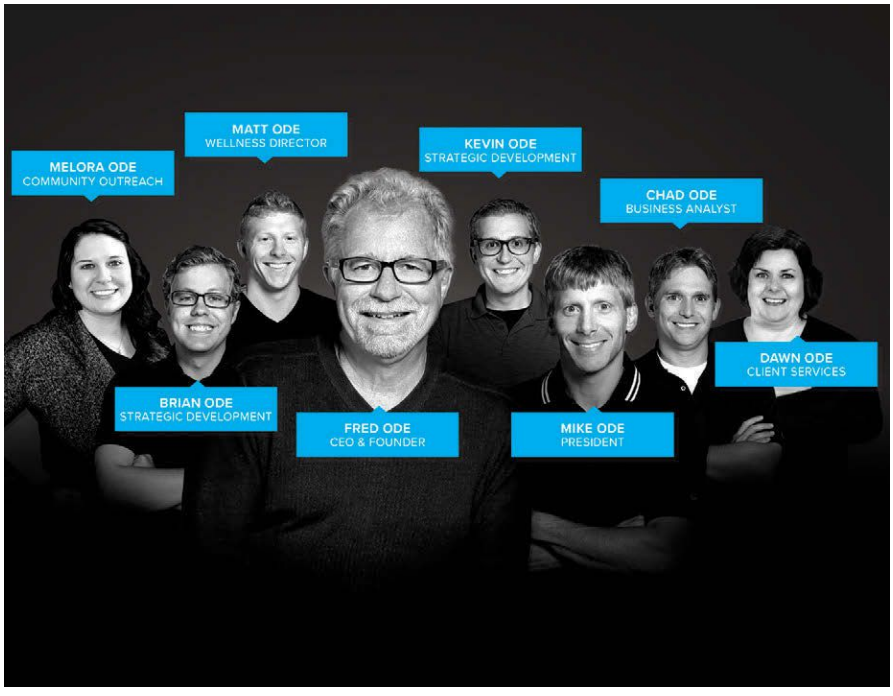
©2019. Express Blower, Terraseeding, and Express Blower design logos are trademarks of Express Blower, Inc.

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# Foundation Software

*More than construction accounting software (but that, too)*

Finding the right software isn't only about purchasing a product—it's about buying into the right business relationship. With the right partnership, running a business can be less about keeping up with day-to-day office tasks and more about finding ways to increase overall profit. It's in the company's commitment to building these types of relationships that has made Foundation Software a trusted partner for thousands of contractors all across the United States.




## HELPING CONTRACTORS RUN THE BUSINESS SIDE OF CONSTRUCTION

Best-known for FOUNDATION—the powerful job-cost accounting software that can handle the most complicated payrolls and detailed equipment and inventory tracking—Foundation goes beyond just providing software to contractors. This idea comes directly from the philosophy that Fred Ode, chief executive officer (CEO) and founder, had when he started the company 35 years ago and has instilled in his employees ever since: Foundation helps contractors run the business side of their construction businesses. And it's this same belief that still shapes the company's approach to the industry and its place in it.

## A PARTNER FOR THE LONG HAUL

Whether through the launch of a sister company, Payroll4Construction.com, a payroll service built just for contractors, or the soon-to-be-released, stand-alone project management platform, Foundation provides solutions to the burdens that contractors face, starting from the sales process. From the get-go, Foundation wants to make sure that its solutions are the right fit for what a contractor needs, and if not, the team at Foundation will help the contractor find one that is—even if it's through a competitor. That's because, unlike companies that might only be looking for a sale, Foundation is looking to make contractors successful. Because in the end, it knows that's going to be Foundation's long-term success as well.

Foundation's dedication to its clients can also be seen in its services after a sale. From an in-house client support team to continuing education classes to online or on-site consulting services, Foundation invests in its clients' goals. Foundation even helps contractors to grow their businesses by getting them in touch with construction-focused certified public accountants (CPAs) in their area through its free, online CPA directory. Paired with product offerings to keep up with the changing times of the industry—like mobile and cloud-based solutions—Foundation is ready to be a partner for the long haul.

## FOCUSED ON CLIENT SUCCESS

On a weekly basis, Ode receives offers from investors looking to purchase what he's built at Foundation. But he knows what that would mean—not just for his employees, but for the clients who have trusted Foundation for so long. Selling would mean changing the focus of the business. Selling would mean losing valuable relationships.

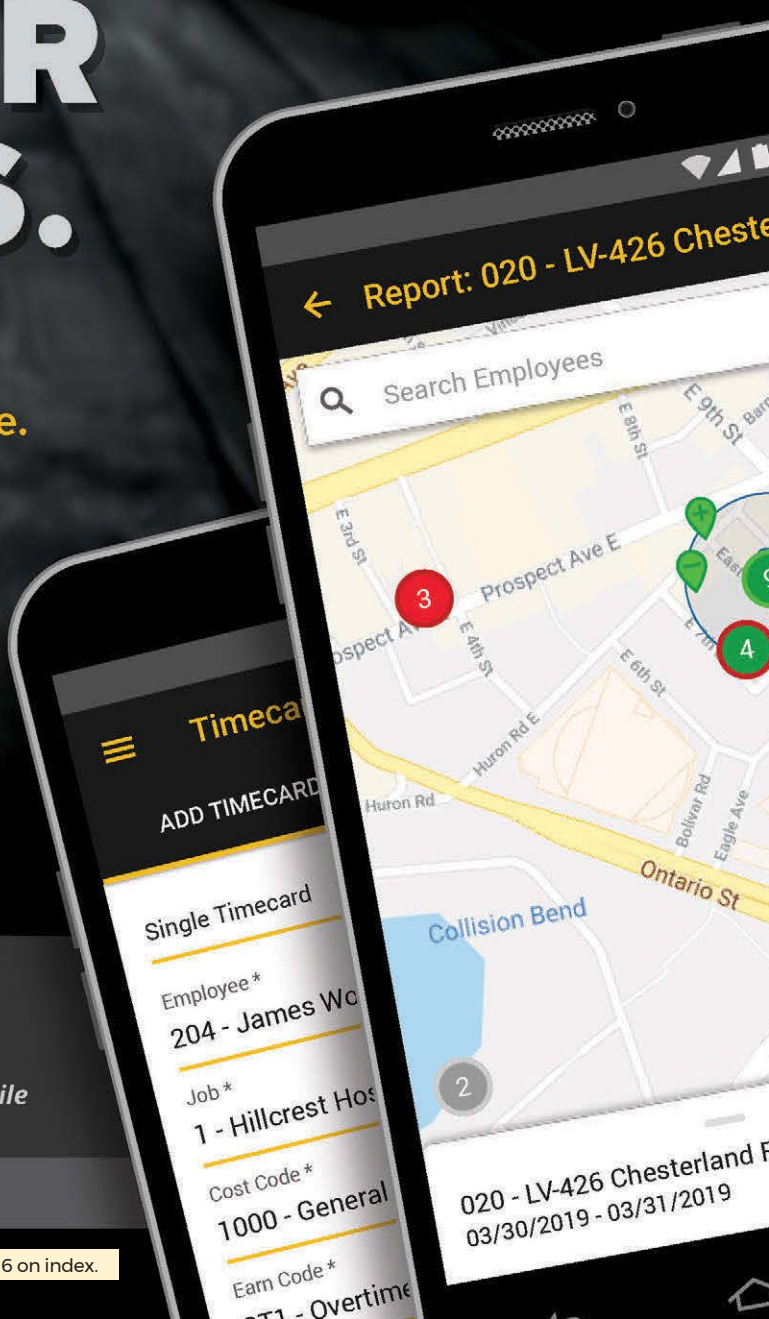
That's why every offer gets the same answer. Where other companies have the influence of outside investors or stakeholders to influence their business decisions, Foundation is—and will continue to be—family-owned and focused on its clients' success.

**Foundation Software**
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# Hino Trucks

*Heavy- & medium-duty trucks with a commitment to improvement*

Hino Trucks, a Toyota Group Company, manufactures, sells and services a lineup of Class 4 through 8 commercial trucks in the United States. Hino Trucks is the premier heavy- and medium-duty nameplate in the U.S., with a product lineup that offers fully connected vehicles with low total cost of ownership, superior fuel economy, unmatched reliability and maneuverability, and the most comprehensive bundle of standard features in the market. Headquartered in Novi, Michigan, Hino has a network of over 230 dealers nationwide committed to achieving excellence in the ultimate ownership experience.



## THE HINO TRUCKS CHARTER

To its customers: Hino meets its customer's expectations by providing useful products and services.

To its business partners: Hino builds relationships of trust by engaging in open communication, with mutual prosperity as its goal.

To the international and local communities: Hino strives to provide products that are safe and environmentally friendly, pursuing a responsible balance with the environment in all of its corporate activities. Hino strives to contribute to local communities in all the regions where it does business. Hino is devoted to good corporate citizenship, complying with laws and regulations and maintaining high ethical standards.

To its employees: Hino respects each individual employee and strives to create a workplace that fosters personal growth.

To its shareholders: Hino works hard to anticipate changes in the business environment in order to improve Hino's corporate value.

## HINO & TOYOTA

In 2001, Toyota Motor Corporation acquired a majority ownership of Hino Motors Ltd., committing to a vision of global leadership in the heavy- and medium-duty truck market, achieved with regional manufacturing of superior performing trucks.

The Toyota Group's commitment to continuous improvement and team development is why Hino Trucks is the fastest growing medium-duty truck company in America. That commitment also explains why Toyota material handling trucks are the bestselling vehicles in their class and why the Toyota Tundra has earned such a reputation for toughness and durability.

The Toyota heritage of design excellence and superior engineering is reflected in every product in the Toyota Group lineup, including Hino Trucks. All of this, along with a customer-first attitude and socially responsible approach, makes Toyota Group a dependable partner for your business.

Hino represents the Toyota Group in the global market for medium-duty trucks, heavy-duty trucks and buses. Hino uses the Toyota production system to achieve continuing gains in productivity and in quality throughout its operations. The company has adapted that system to its model line to offer customers the best-possible products at competitive prices.

While process is important, people are the key to the Hino/Toyota quality story. Its focus on training, along with the work ethic of its manufacturing team, are responsible for its reputation for product excellence. Got a tough job? The Toyota Group has a vehicle that can handle it.

**Hino Trucks**
**248-699-9300**
**marketing@hino.com**
**hino.com**

HINO TRUCKS
A Toyota Group Company

# THE TRUCK IS JUST THE BEGINNING.

POWERON.




When you start up your new Hino XL SERIES, our journey with you is just beginning. That's because every Hino comes standard with a 5-Year Warranty, 24/7 HinoWatch, and Hino Insight Connected Vehicle Solution. Why? Because taking care of you and your truck is what we call the **ULTIMATE OWNERSHIP EXPERIENCE.**

5 YEAR WARRANTY | HINOCARE | 24/7 ASSISTANCE HINOWATCH | INSIGHT

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WWW.HINO.COM

# Honda Power Equipment

*Versatile power, adaptability & excellent fuel efficiency in a compact package*

Honda Power Equipment, a business unit of American Honda Motor Co. Inc., manufactures and markets a complete range of outdoor power equipment products, including generators, walk-behind and robotic lawn mowers, pumps, snow blowers, tillers, string trimmers, marine outboard motors, and general-purpose engines for commercial, rental and residential applications. A network of more than 4,000 independent Honda Power Equipment dealers sells Honda products throughout the United States; approximately 2,000 Home Depot stores carry the company's generators, lawn mowers, tillers and snow blowers; and nearly 1,700 national rental company outlets offer Honda generators, pumps and other products.

As the world's largest manufacturer of engines, Honda offers a comprehensive range of fuel-efficient, four-stroke models that provide easy start; quiet, low-vibration operation; and dependable power for thousands of different product applications, including pressure washers, lawn mowers, rescue and construction equipment. Honda engines are some of the quietest and easiest to start of their kind—even in harsh commercial and construction environments. Such attributes have made Honda engines the popular choice for original equipment manufacturers (OEMs), especially commercial construction and turf industry customers looking to add value to their own brands with more versatile power, greater adaptability and fuel efficiency in a compact package.

## ALWAYS POPULAR IN POWER EQUIPMENT

While customers rely on Honda Power Equipment for its complete line of generators for commercial and consumer applications, many may not realize that Honda engineers developed a form of inverter technology that functions to substantially reduce weight and noise and improve fuel efficiency on a number of its models.




On jobsites, crews have come to depend on the high-quality power output from Honda Industrial Series inverter models, including the EB2200i, which incorporates a 20A 125V GFCI Duplex outlet GFCI neutral bond, and the EB2800i, a rugged, open-frame model ideal for powering multiple tools.

## WHAT'S NEW WITH HONDA ENGINES

Four new Honda V-Twin engines, the iGX700/iGXV700 and iGX800/iGXV800, offer commercial construction and turf industry customers versatile power and greater adaptability with excellent fuel efficiency in a compact package.

Providing enhanced performance and quality, Honda V-Twin engines are equipped with fuel injection technology and an integrated, electronic self-tuning regulator (STR) governor that delivers drive-by-wire remote control capability to manage key aspects of engine operation. Available in both horizontal and vertical shaft configurations, the new Honda V-Twin engines are an ideal fit for demanding commercial applications requiring concrete and construction equipment and commercial turf equipment.

The all-new, high-output Honda GX50 expands the company's Mini Four-Stroke lineup and incorporates a higher displacement, making it an ideal power match for demanding rental, industrial, construction and professional landscape applications.

Available now and for sale to power equipment OEMs, the versatile Honda GX50 brings its lightweight, compact design, easy starting and excellent fuel efficiency to power products ranging from brush cutters to rammers and vibrators to concrete screeds, post drivers and winches.

**Honda Power Equipment**
**770-712-3082**
**davis_adams@ahm.honda.com**
**honda.com**




# The Honda EB2200*i* Industrial Series Inverter Generator. It's Trusted Jobsite Power.

## Now packed with more features and 10% more power.*










It's time to get more work done, when you want, where you want, with the EB2200*i* generator from Honda. It's easily portable and now packed with 200 more watts* of stable power and all-new features. With a GFCI 120 volt duplex receptacle, OSHA compliance, and the same reliability you expect from Honda, it's trusted jobsite power. Learn more at gen.honda.com.

HONDA

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*10% more power at max load than the EB2000*i* Honda generator. Please read the owner's manual before operating your Honda Power Equipment and never use in a closed or partly enclosed area where you could be exposed to odorless, poisonous carbon monoxide. Connection of a generator to house power requires a transfer device to avoid possible injury to power company personnel. Consult a qualified electrician.

© 2019 American Honda Motor Co., Inc.

# InEight

*Delivering successful project outcomes*

InEight has been developing capital project management software for over 30 years. The company's solutions are designed for every stage of the project life cycle—from design to estimate, and from field execution to turnover. Its purpose-built software provides the real-time information and insights necessary to minimize risk, improve operational efficiency, control project costs and make educated decisions.

What differentiates this Scottsdale, Arizona-based company is its construction industry roots. InEight is a subsidiary of Kiewit, one of North America's largest engineering and construction firms. Because of this legacy, InEight has the ability to develop software that is purpose-built for the industry. InEight's capital project management software helps owners:

- Regain control of their projects
- Manage complex change and forecasting
- Drive collaboration between the field and office
- Eliminate communication gaps and silos

With one-third of all megaprojects failing, InEight's aim is to deliver innovative software that helps owners make timely, actionable decisions with detailed analytical capabilities across the entire project or portfolio. Its solutions reduce risk because owners have greater project oversight.

Greater project control can alleviate many of the cost and scheduling overruns owners face. InEight's project management software can bring together critical budget, planning, as-built and what-if forecasting functions. Instead of seeing typical projects, delivering almost one quarter



less net present value than planned, owners can now track and manage changes and determine earned value across their entire portfolio.

With the average capital project reaching completion 20 months behind schedule and as much as 80% over budget, InEight's tools are designed to streamline the development of work and daily plans, and efficiently communicate work back to the office. InEight's portfolio of solutions enables owners to capture contractor performance in real time. The end result is more work delivered on time and on budget.

Another common challenge construction professionals face is spending too much time on low-value activities. InEight's software delivers a single and controlled source of project truth, reducing the need for point solutions and siloed data. The company's time-tested solutions drive better communication and collaboration across the entire project team by coordinating emails and automated workflows for distribution and review.

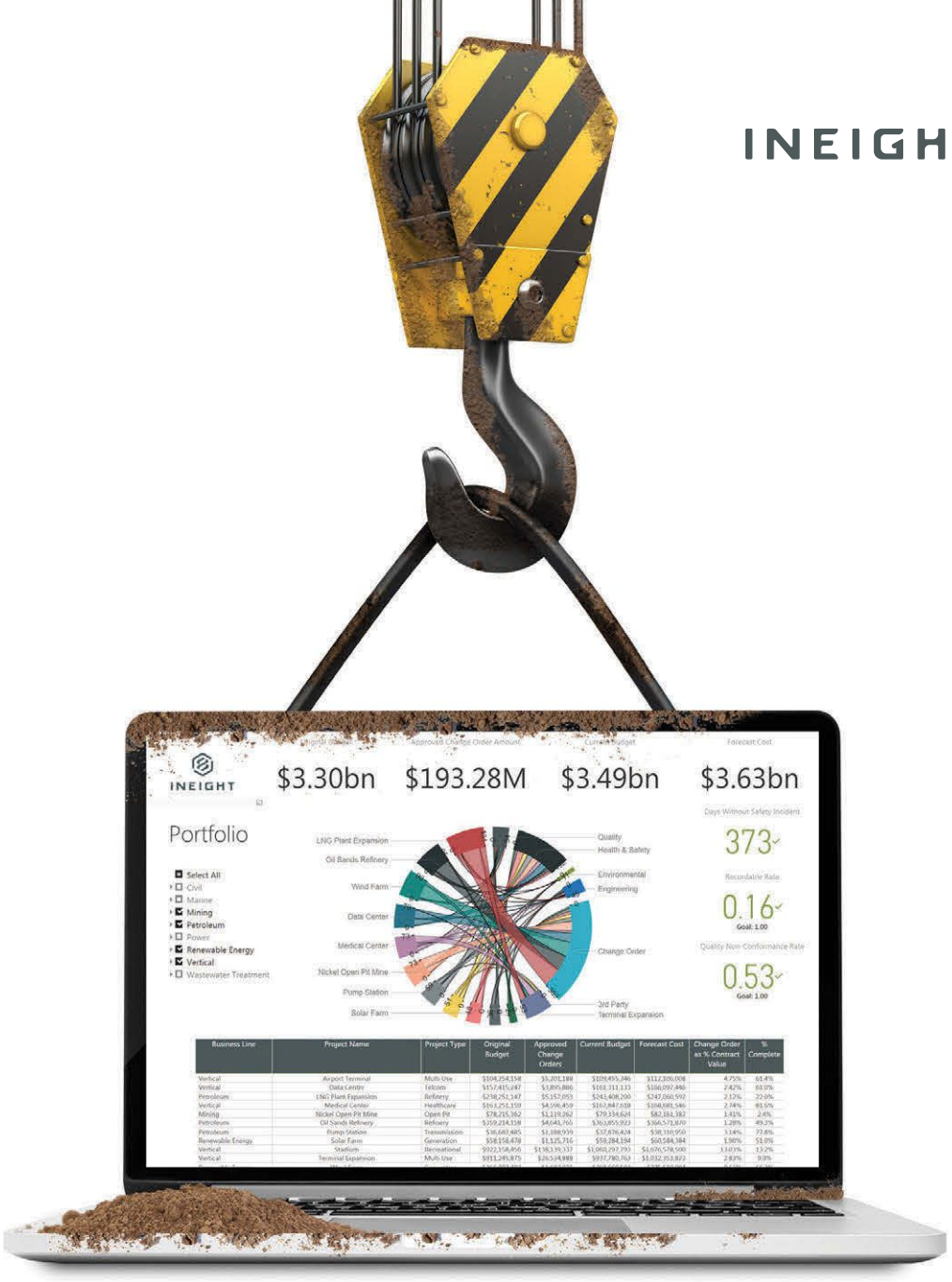
InEight delivers software that integrates seamlessly with other systems. Its products are interconnected and modular, which provides critical visibility into project data. InEight's portfolio of capital project management software offers tools for:

- Risk, planning and scheduling
- Project cost management
- Document management
- Connected analytics
- Project administration
- Virtual design and construction
- Field execution management

A cloud-based architecture allows InEight's applications to work from wherever work takes you so that all team members can leverage information, gather insights and anticipate impacts for the entire life cycle of capital projects.

**InEight**
**866-643-3975**
**sales@ineight.com**
**ineight.com/cbo**

INEIGHT




# A NEW WAY TO BUILD

Finally, take control of your projects at every phase of construction.
Find out how with InEight software.

**InEight.com/CBO**

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# Kobelco

*Excavators built like no other*

Since 1930, Kobelco has designed and built excavators to be the leaders in the industry, adding innovation to its machines at every turn. It's an attitude that led to the development of the first short rear-swing excavators and the demolition machine with the longest reach in the world.

Kobelco is continuing its commitment to quality and innovation by building the strongest dealer network in North America and backing all machines with the best warranty in the business. Bringing the manufacturing of Kobelco excavators to the United States is another major part of the company's commitment. The Kobelco USA excavator production facility in South Carolina can produce more than 1,800 machines per year, with plenty of room to expand. And the Kobelco parts facility in Texas is stocked with more than 55,000 line items ready to ship overnight. With one eye on the future, Kobelco is staying ahead of the competition and anticipating what the industry will need tomorrow.




## BUILT FOR POWER

Kobelco knows what it's like to sit in the operator's seat when hitting something solid. The power boost button on most excavators can deliver the extra force users need to break through, but only in short bursts. The power boost function in Kobelco excavators is designed to have no time limit. Operators will never be left demanding power their machines just can't deliver.

## BUILT TO MULTITASK

When it comes to complicated tasks, Kobelco excavators are pros. The Kobelco-exclusive independent travel feature allows the machine to move, lift and swing simultaneously without experiencing any loss of power. It's safety and efficiency you just won't find anywhere else.

## BUILT FOR EFFICIENCY

Extra power often comes at the cost of extra fuel consumption. With Kobelco excavators, customers get best-in-class fuel economy every time they fire up the engine—no matter how tough the job. Three operating modes let operators dial in the perfect balance of fuel economy and jobsite productivity to suit the needs of the day. And the Kobelco Generation 10 machines take efficiency to a whole new level, boasting up to a 16% increase in fuel economy.

## BUILT FOR SAFETY

From the operator's chair of a Kobelco excavator, users get an almost 360-degree view of the jobsite. Kobelco excavators also come standard with a rear camera and rear working lights to further enhance visibility. Plus, swing flashers help other workers know when to stay out of your way.

## MASSIVE WARRANTY

All models come with a standard full, 3-year or 3,000-hour warranty. Models from the SK75 and up also include 3 full years of KOMEXS machine monitoring. You can relax knowing nearly every powertrain and hydraulic component in your excavator is fully covered with no deductible.

From mini to massive excavators, and with a wide range of specialty machines, Kobelco has an excavator model perfect for the job at hand.

Visit kobelcousa.com to access the latest machine specs, product information and dealer locations, and to compare Kobelco excavator models, not only with one another, but with the models of other manufacturers.

**Kobelco**
**281-888-8430**
**kcmumarketing@kobelco.com**
**kobelcousa.com**




## ENGINEERED TO DO ALMOST ANYTHING.

From our rigorous research & development to our precision manufacturing processes, KOBELCO machines are built to do more than any other excavator out there. Dig, lift and travel simultaneously with our exclusive independent travel feature. Work without a time limit on power boost. And do it all faster, safer and more efficiently than ever before with other exclusive innovations you won't find anywhere else. Step into a cab and see for yourself what sets them apart.

KOBELCO

KOBELCO-USA.COM

MINI | SHORT RADIUS | CONVENTIONAL | LONG REACH | HIGH & WIDE | MASS | DEMOLITION | HYBRID

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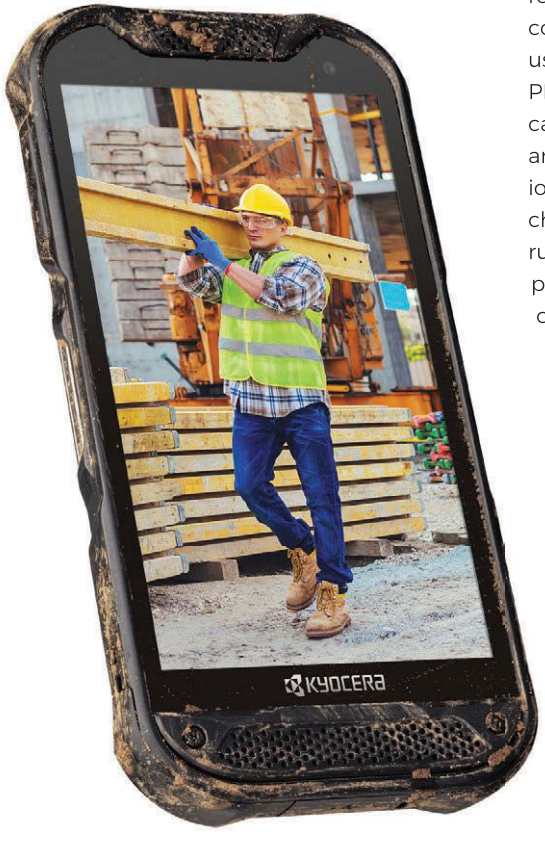
# Kyocera International Inc.

*The rugged DuraForce PRO 2 helps boost your company's bottom line*

Anyone who has ever dropped and cracked a smartphone, spent hundreds of dollars on protective cases, or tried and failed to call a client in the middle of construction, realizes the value of rugged mobile devices. Kyocera has been creating and perfecting rugged and waterproof mobile devices for a decade. The company launched its most recent ruggedized smartphone, the DuraForce PRO 2, earlier this year for Verizon and AT&T.

Construction business owners and workers can benefit greatly from an ultra-durable device like Kyocera's DuraForce PRO 2 for several reasons:

- *Cost savings*—The initial (typically high) price tag of the latest smartphone is only part of the equation. The total cost of ownership (TCO) takes into account the initial investment and subsequent costs associated with future device failures and breakage. The annual TCO for non-rugged devices is estimated to be twice the cost of rugged devices. Broken devices lead to worker downtime and significant replacement costs. Precision-built in Japan, Kyocera's DuraForce PRO 2 is the lowest-priced rugged smartphone available with a major carrier, and its 2-year manufacturer's warranty helps ensure a low TCO.
- *Increased productivity*—Smartphones provide a mobile operations center for businesses, enabling more accurate timecard reporting, worker tracking, project collaboration, asset and equipment usage tracking, and more. DuraForce PRO 2's super wide view 4k action camera helps document jobsites and its 3240 milliamp hour Lithium-ion battery with wireless and fast charging keep the device up and running on long days. Kyocera has partnered with Vibes accessories to create a universal multipurpose case for shareable digital tools, such as extended-use batteries, a barcode scanner and radio frequency identification (RFID) reader for inventory, and a Spike smart laser measuring tool to measure hard-to-reach areas at a distance.
- *Proven design and durability*—For most construction workers, simply having protection from a cracked screen or water damage isn't nearly enough. For those who work in the field, often in hazardous conditions, a mobile device that can drive workflow and stand up to rigorous, often-dynamic environments is a must. DuraForce PRO 2 features military-standard 810G certifications for protection against shock and vibration, as well as exposure to extreme environmental conditions, such as heavy dust, high altitudes, solar radiation, heavy salt and fog, thermal shock, icing and freezing rain, and extreme humidity, and is certified IP68 to be water- and dust-proof.
- *Better communication*—The DuraForce PRO 2 has been designed specifically to optimize crystal-clear, two-way communication. An advanced echo- and noise-cancellation system features four powerful microphones and 106dB+ speakers that enhance audio while canceling surrounding noise, making it perfect for enhanced push-to-talk support over Wi-Fi or LTE and clear speakerphone calls, even on the busiest jobsite.




As the largest manufacturer catering to the rugged market, Kyocera has a long history of providing the best combination of durability, affordability and performance. The DuraForce PRO 2 is Kyocera's latest rugged device that can help improve productivity and boost the bottom line for your construction business.

**Kyocera International Inc.**
**310-750-7082**
**leasa@lpicommunications.com**
**kyoceramobile.com**

DURAFORCE PRO 2

# YOUR PARTNER ON THE JOBSITE

The fully ruggedized DuraForce PRO 2 by Kyocera is one of the most advanced computing and communications platform. It can survive water, drops, vibration and dust on even the toughest construction site. It's flexible enough to be used not only as a mobile phone, but also as a two-way radio with push-to-talk support over 4G LTE and Wi-Fi. The full-featured Android smartphone also includes a two-year manufacturer's warranty and integrates with third-party solutions* to help increase productivity by managing all of your projects. Choose the communications solution that's as tough as your crew: **Go DuraForce PRO 2**

## SECURITY

*Secure device encryption to protect against tampering; fingerprint security sensor on the phone's power button for biometric authentication and FIDO® Certified for stronger authentication.*

## SURVEY JOBSITE IN ONE PHOTO

*Features a 13-megapixel HDR-capable camera, 5-megapixel front-facing camera and a unique 135° Super Wide View 4K Action camera for capturing the entire jobsite in a single photo.*




## WATERPROOF & RUGGED

*Certified Military Standard 810G and IP68 waterproof** and dust proof, built-in protection from the inside out. No extra case required!*

## TWO-WAY RADIO

*The large, dedicated side button with loud dual front speakers for Push-to-Talk. Helps your crews collaborate more productively, securely and cost-effectively.*

DURA FORCE PRO 2 by KYOCERA

MANUFACTURER'S 2-YEAR warranty

*Applications and accessories are provided by Kyocera third-party solution partners and may incur additional costs.
**Certified waterproof 6.5 feet for 30 minutes.

For more information visit www.kyoceramobile.com and www.kyoceramobile.com/duraforce-pro-2/

Kyocera International, Inc., 8611 Balboa Avenue, San Diego, CA 92123 USA 1-800-349-4188, Outside USA 1-858-882-1410

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Now available with VIBES Modular system of interchangeable accessories. Contact 866-866-VIBE or info@vibesmodular.com.



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# Liberty Mutual Surety

*Win in the marketplace with a committed team of construction & specialty underwriters*

Liberty Mutual Insurance, a Fortune 100 company, offers a complete suite of property and casualty, surety and specialty products for construction companies. When you work with Liberty Mutual and Ironshore, you receive the benefit of flexible, comprehensive insurance and surety programs, developed by a committed team of construction and specialty underwriters.

Additionally, you will have access to industry-leading risk control resources and services. In-house teams of construction attorneys and risk management/pre-claims services provide construction companies with thought leadership and guidance from the underwriter's perspective.

In the event of a claim, you'll receive unparalleled claims handling across the coverage spectrum, from liability, workers' compensation, and defect claims to complex construction insurance and surety claims. It is why construction customers stay with Liberty Mutual—some for more than 80 years.

Liberty Mutual Surety, a business unit of Liberty Mutual Insurance, is the second largest surety in the United States[1] and a leading surety globally. Liberty Mutual Surety is continually expanding its global presence by establishing offices and issuing bonds worldwide. With underwriting facilities in more than 15 countries and the ability to issue bonds in more than 60 countries, it has the capabilities and the professionals to underwrite all types and sizes of contractors and corporations.

When you choose Liberty Mutual Surety, you receive financial strength, stability, innovation, and extensive knowledge of contract and commercial surety. Its incomparable suite of client services helps customers and agencies win in the marketplace.



## ENHANCED SERVICE OFFERINGS

It offers a variety of programs to benefit both agents and customers. Agent training opportunities, a dedicated contracting risk solutions group, custom industry-related insights, bond issuance platforms and more.

Liberty Mutual Surety is continually evolving to meet the needs of its agents and customers, providing innovative solutions to help their businesses grow and prosper.

## GLOBAL PRODUCT OFFERING

Liberty Mutual Surety underwrites all types of regional, national, multinational and global contractors.

- Its U.S. operations provide program capacity for all sizes of contractors, and for well-capitalized construction, manufacturing and supply risks. Programs are customized to meet and grow with your bonding needs.
- Its global risk team provides capacity for international and U.S. multinational customers. In collaboration with other Liberty Mutual units, it can also provide you with comprehensive property and casualty coverage, ensuring all aspects of your projects are protected from start to finish.

## SUPERIOR CLAIMS HANDLING

Every project begins with the best intentions, but sometimes unexpected problems arise. In the event that complications occur, you can rest easy knowing Liberty Mutual Surety has a dedicated team of in-house claims and legal employees with extensive experience addressing construction claims.

When you choose Liberty Mutual, you'll work with one company to cover construction risks from start to finish. Choose a company you can trust. For more information, contact your independent agent or broker or visit libertymutualsurety.com.

[1]Based on 2018 Direct Written Premium

**Liberty Mutual Surety**
**610-832-8240**
**surety@libertymutual.com**
**libertymutualsurety.com**



# Better Understood. Better Prepared.

Liberty Mutual SURETY

**Liberty Mutual Surety provides you with the construction insights you need to succeed.** Through knowledgeable underwriters, customized data-driven reports, and specialized engineers and accountants, Liberty Mutual Surety's suite of client services can help you optimize your business and win in the marketplace.

Learn more about our enhanced service offerings by talking to your agent or visiting **www.libertymutualsurety.com.**

**BID BONDS | PAYMENT BONDS | PERFORMANCE BONDS | SUPPLY BONDS | MAINTENANCE BONDS**

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# Mobileye

*The safe & smart choice for collision avoidance in construction*

For the construction industry, safety must be the No. 1 priority. The reason is obvious: jobsites are dangerous places—falls, dropped objects and electric liability are all clear and present dangers. However, some in the industry may be overlooking another threat—vehicle collisions.

According to CPWR, The Center for Construction Research and Training, there were 384 construction workers killed by vehicles between 2011 and 2015. That works out to an average of more than 75 deaths per year. So, what can the construction industry do to lower these numbers?

Winslow Construction decided to take on this challenge. When the company researched solutions to protect workers from vehicle collisions, it decided on collision avoidance technology as its best choice.

Collision avoidance tech typically is artificial intelligence (AI), sensor-based technology. It works by detecting when a vehicle is in a situation where a collision is imminent and alerts the driver of potential danger. These driver alerts include:

- *Forward collision warning (FCW)*—Which warns of imminent collision with a vehicle ahead
- *Headway monitoring and warning (HMW)*—Which constantly monitors and warns if the distance to the vehicle ahead becomes unsafe
- *Lane departure warning (LDW)*—Which warns of unintentional deviation from the driving lane
- *Pedestrian and cyclist collision warning (PCW)*—Which warns of imminent collision with a pedestrian or cyclist ahead—an especially important feature for jobsites crowded with workers who may not be focusing on the vehicles around them at any given time




These systems have become common in new vehicles, often as an add-on. Winslow was looking for a system that could be retrofitted into its existing vehicles. The company decided to install Mobileye's collision avoidance system into 60 of its vehicles as a pilot project.

The selection of Mobileye brought several advantages to the program—it could not only be retrofit to its existing fleet; Mobileye's FCW and LDW both meet the National Highway Traffic Safety Administration's (NHTSA) guidelines*, and Mobileye's technology has been widely adapted by major auto manufacturers.

Winslow's pilot program quickly saw results—during this test period, their fleet experienced zero collisions and, according to the company, improved driver behavior. After the pilot project, Winslow decided to install the system throughout its 400-vehicle fleet. Essentially, there was no compromise on the safety technology provided by keeping the existing fleet vehicles.

It should also be pointed out that while safety is always Mobileye's No. 1 priority, it turns out that safety is also good for a healthy bottom line. According to the Occupational Safety and Health Administration, vehicle crashes that cause injury cost employers $74,000 on average, while a fatality raises this to $500,000. In a field that has added pressures of deadlines and tight budgets, the associated decrease in cost could mean the difference in making project expectations. Mobileye customers have also reported indirect cost savings, like drops in fuel consumption, possibly due to a decrease in harsh braking and other improved driving habits, and decreases in insurance premiums.

For many years, trucking, cargo and other firms with large fleets have learned the safety and financial benefits of Mobileye's collision avoidance system. It seems the time has come for the construction industry to benefit from these efforts.

*Based on an independent evaluation by the Transportation Research Center

**Mobileye**
**877-867-4900**
**info@mobileye.com**
**mobileye.com/us/fleets**

MOBILEYE®
An Intel Company

# AT WORKSITES IT'S TIME TO FOCUS ON SAFETY




A busy site with busy workers and distracted drivers is a perfect recipe for injuries or worse.

Are you doing everything you can to protect your crew? Sure, video can help you review what happened afterwards, but wouldn't it be better to prevent any injury before it occurs?

Let Mobileye help keep your drivers focused and prevent injuries **before** they occur.

Mobileye's collision avoidance system includes forward collision warning, alerting drivers before an imminent collision with a vehicle ahead, and pedestrian collision warning, alerting drivers before an imminent collision with pedestrians – for example, construction site workers, crossing their path. And, we know that work sites can be active from dawn to dusk, but no matter: our detections function even in low light conditions*.




1 The camera unit containing the camera, EyeQ® chip, and speaker, mounted on the inside of the windshield behind the rearview mirror.

2 The EyeWatch™ display for visual alerts, mounted in the bottom corner of the windshield.

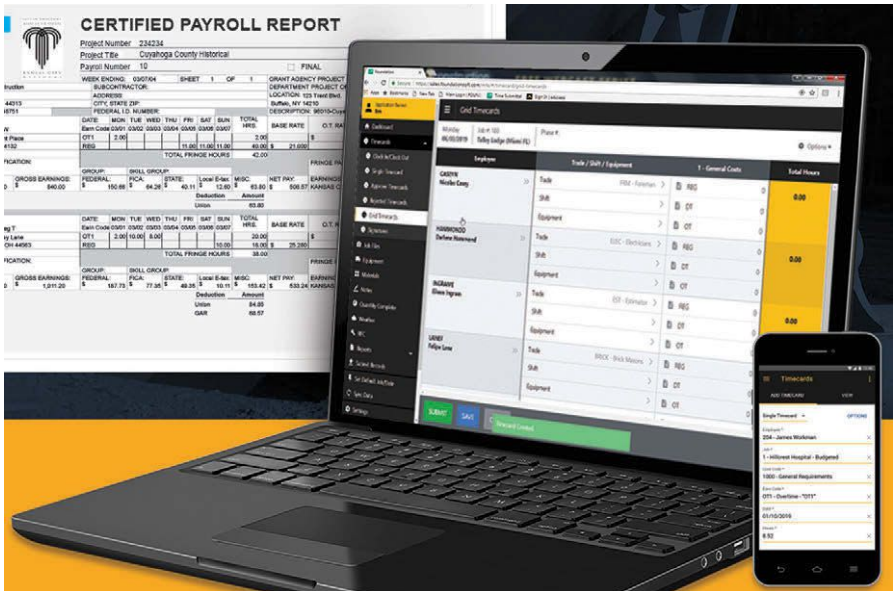
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**For more information on how Mobileye can help save lives (and money),**
contact us at +1-877-867-4900 or go to www.mobileye.com/en-us/contact

# Payroll4Construction.com

*The payroll service built just for contractors*

There are a lot of payroll processors, but few can meet the needs of contractors quite like Payroll4Construction.com. Whether you're handling payroll in-house or through another processing service, Payroll4Construction.com has the power to simplify even the most complex construction payrolls, such as multistate, union and prevailing wage.




## PAYROLL PROCESSING WITHOUT THE PROCESS

Construction payroll can be difficult. With payrolls containing timecards for multiple trades and wages and work performed in multiple states with varying tax jurisdictions, it can be overwhelming to keep track of rates and calculations for each employee—not to mention factoring in any union benefits, fringes or certified payroll on top of it all.

Because these variables are all fairly unique to the industry, other payroll providers often aren't familiar with or equipped to process them. It's also why Payroll4Construction.com excels for contractors—it knows construction because it focuses on it exclusively and designed its system for it specifically.

Since Payroll4Construction.com was built with construction in mind, completing payroll is simplified. By focusing pay around the job, contractors only need to enter a few fields, and all of their payroll, including wages for different trades and rates for different tax jurisdictions, calculates automatically. And with its dedicated team of in-house experts, Payroll4Construction.com keeps up to date with all of the changes in the industry—from tax updates to new legislation and anything related to construction. Because Payroll4Construction.com is prepared, its clients can be compliant.

## FEATURES CONTRACTORS NEED

As a full-service payroll provider, Payroll4Construction.com has all of the usual features you would expect —the team will print and mail your paychecks, submit your direct deposits, take care of your tax filings, and create your W-2s at the end of the year.

You will also get new hire and Equal Employment Opportunity (EEO) minority compliance reports, saving time from having to keep track of this information by hand.

What really sets Payroll4Construction.com apart is that it will also provide you with construction-specific features and reports like being able to enter multiple jobs, rates, trades and localities on a single timecard, keeping track of your job costing, and creating automated reports, including certified payroll for numerous federal, state and other agencies.

With Payroll4Construction.com's reports, you have access to all of the information you need for each payroll. It's as simple as logging in and selecting the report you want to see. You can also download all of your job costing, union or certified payroll reports that are already formatted and ready to be uploaded directly to the reporting authority—completely free.

Plus, with integrations available, you can keep your preferred software and still use Payroll4Construction.com's services, including QuickBooks and FOUNDATION, along with mobile timekeeping apps.

## GET AN INSTANT QUOTE

See what you can gain by switching to the payroll processor built just for the construction industry.

Visit Payroll4Construction.com to learn more, check out sample reports and get an instant, personalized quote.

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**info@payroll4construction.com**
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# A Payroll Service Just for Construction




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| | | ❯ And So Much More! |

## Get Your Free Quote

**payroll4construction.com | (800) 949-9620**

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# Progressive Commercial Auto Insurance

*A company you can trust to protect the business you've worked hard to build*

As the No. 1 commercial auto insurer in the nation[1], Progressive offers a wide range of commercial insurance options to suit your business needs. From minimum coverage to comprehensive protection, Progressive's flexible options make it easy to find customized vehicle insurance. Plus, you can shop a variety of other business insurance products. Its direct representatives and independent agents are knowledgeable about insuring construction businesses like yours.

It's easy to see why so many business owners trust Progressive to protect their livelihood. Here are a few of the many reasons you can rely on Progressive for your commercial auto needs:

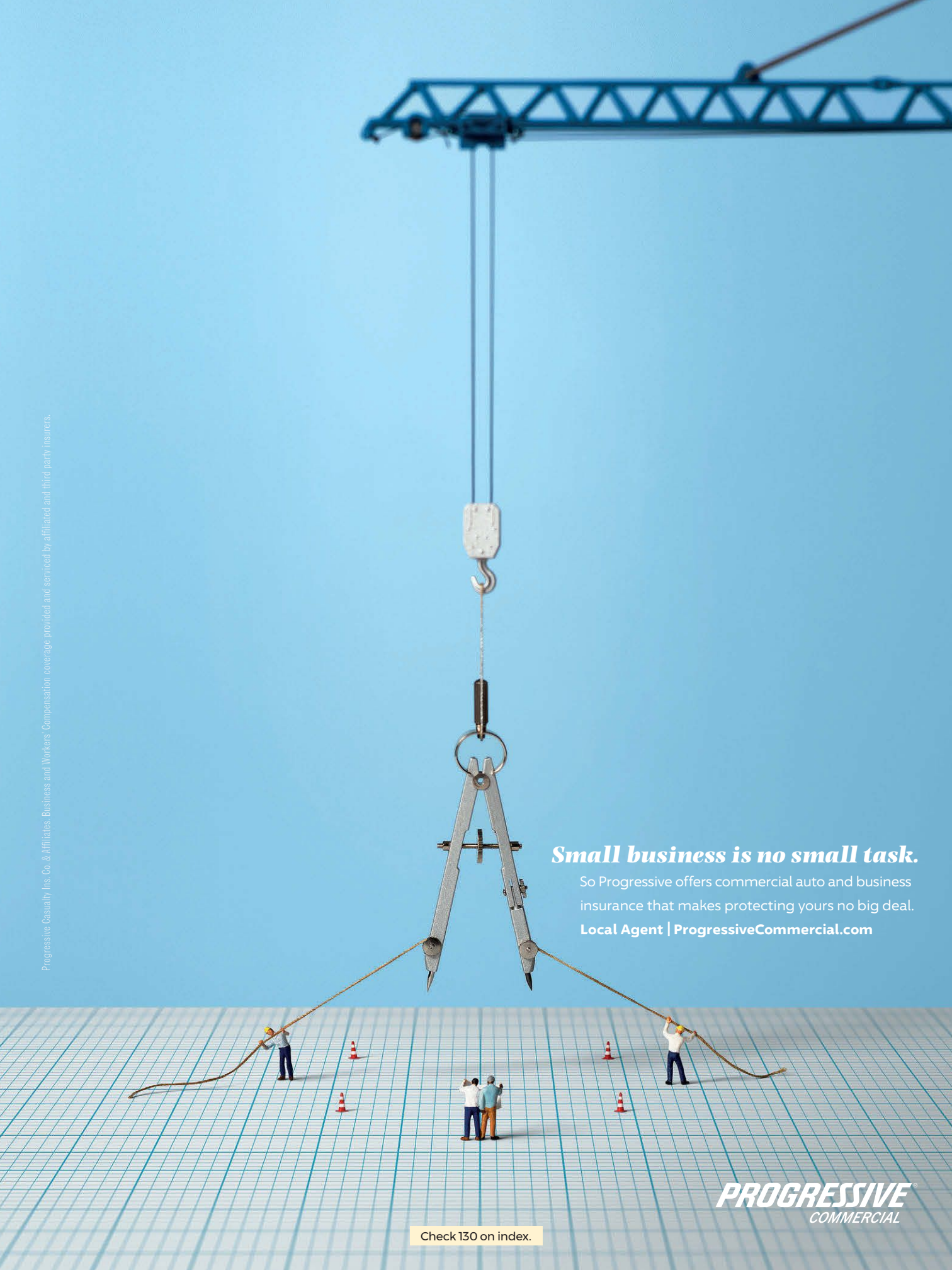


1. *Industry experience*—It has a history of insuring a construction business like yours. Experience in your trade allows Progressive to ask the right questions to help you get the coverages and limits you need to stay protected. Its team of insurance experts are typically up to date on the latest coverages and trends to make sure you're getting great protection for your work vehicles.
2. *In-house commercial claims representatives*—Progressive knows your work vehicles are an integral part of your construction business. Its dedicated team of adjusters have experience in handling commercial claims to help you get back to work faster. Plus, it handles everything in-house, so you're working with Progressive directly, instead of with an outside company.
3. *Adaptable to changes in your business*—Your insurance needs will likely change over time. Progressive offers a wide range of coverage limits and options so your policy can be easily updated when you buy a new truck or secure a business contract. It can help you find other business protection like general liability and workers' compensation, so you have the right coverage for each stage of your business's development.
4. *Customizable coverages*—No two construction businesses are the same, so you wouldn't expect their insurance to be the same either. Whether you're a seasonal business, tow a trailer, or have attached equipment on your vehicle, Progressive can customize your policy to fit the needs of your specific business. You can also call the team to change your coverages, limits, vehicles and drivers any time.
5. *Ways to save*—Discounts help you get the quality insurance you need at a more affordable price. You could be eligible for a discount by paying your policy in full or paying your bills electronically. Progressive offers additional savings based on your number of years in business, existing commercial coverage and more.[2] Ask the team what you qualify for to get more bang for your buck.
6. *Available when you need it*—Progressive knows work isn't limited to a 9-to-5 schedule—that's why it has made it easy for you to reach the team at a time that's convenient for you. Whether you need to make policy changes, request an insurance certificate or file a claim, Progressive is available 24/7 by phone or online. Its knowledgeable staff aims to take care of your needs so you can get back to what matters most—your business.

[1]No. 1 commercial auto insurer from SNL Financial's 2017 national written premium data.

[2]Discounts and coverages may vary and are not available in all states or situations.

**Progressive Commercial Auto Insurance**
**888-806-9598**
**progressivecommercial.com**




Progressive Casualty Ins. Co. & Affiliates. Business and Workers' Compensation coverage provided and serviced by affiliated and third party insurers.

Check 130 on index.

# Tenna

*Beyond tracking*

Tenna is a construction technology platform that revolutionizes equipment fleet operations.

**When looking for a construction technology partner, consider one with over 100 years of experience in the industry. Tenna understands what you need to know & control to help you make more money.**

## KNOW MORE

With Tenna's comprehensive, reliable tracking and unified platform for mixed assets that has been built on the foundation of over 100 years of construction experience, you will be able to go beyond a dot on a map and have uninterrupted visibility across your entire equipment fleet.

## CONTROL MORE

Controlling your equipment fleet is always better than your fleet controlling you. How can you control it?

Monitor valuable information on your machines like:

- *Status*—Is it in use or sitting idle?
- *Assignee*—Who is currently or recently assigned to a piece of equipment?
- *Maintenance*—Is it in need of repair? Is it in service? Is routine maintenance due?

Monitor operations at the project level like:

- *Equipment utilization*—Is it working for you or sitting idle on site? Is it where it needs to be when you need it?
- *Job cost*—What is your equipment costing your project compared to what you budgeted?
- *Safety and compliance*—Completing inspections electronically in the field will give you real-time safety and compliance reports, which helps you mitigate risk.

Finally, back to the main office. Tenna's solution provides end-to-end, bilateral communication—from the field to the shop to the office. This provides an unmatched level of transparency to your equipment fleet across all projects and also allows for purchase controls.

## MAKE MORE

With Tenna's solution, you can make better rent, own and move decisions. You will have improved utilization and can expect more predictable days.

When looking for a construction technology partner, consider one with over 100 years of experience in the construction industry. Tenna understands what you need to know and control to help you make more money. Know more. Control more. Make more.

**Tenna**
**833-508-3662**
**jpierangeli@tenna.com**
**tenna.com**



# Go Beyond the Dot.

Tenna is the construction technology platform that revolutionizes equipment fleet operations.



## Know More.

Comprehensive, reliable tracking on a uniformed platform for mixed fleets that is built on over 100 years of construction experience.

## Control More.

From the machine to the project to the office.



## Make More.

Informed decisions, get higher utilization and have more predictable days.

TENNA®

www.tenna.com
(833) 50TENNA



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# Bento for Business

*Spend management programs to improve small business cash flow*



Bento is reinventing how businesses manage B2B payment workflows in a digital world. Bento's financial operating platform allows businesses to issue payment credentials to people and systems without introducing risk, while providing unparalleled asset protection, productivity gains, cash-flow predictability and business profitability.

Bento business debit cards and industry-leading management tools give companies unprecedented control and visibility over company expenses, minimizing fraud and administrative overhead. Virtual cards, open APIs and white-label partnerships extend these control and management benefits to automate payments well beyond expenses alone.

Card and payment controls can be set to limit not only how much money can be spent, but also when and where. Information is reported, with a clear view, in real time, to give business owners and managers total visibility on who is spending money, where they are spending it and how this tracks to budget. This information syncs with QuickBooks and can be uploaded into other accounting systems.

Bento's solutions help businesses reduce costs and track expenses to make smarter spending and forecasting decisions, while its logical workflow frees up management time and resources. This information helps Bento customers invest and grow where they live. Bento's analysis and input from customers demonstrate tremendous savings from reducing inefficiencies in expense management. Bento looks forward to helping your company, too.

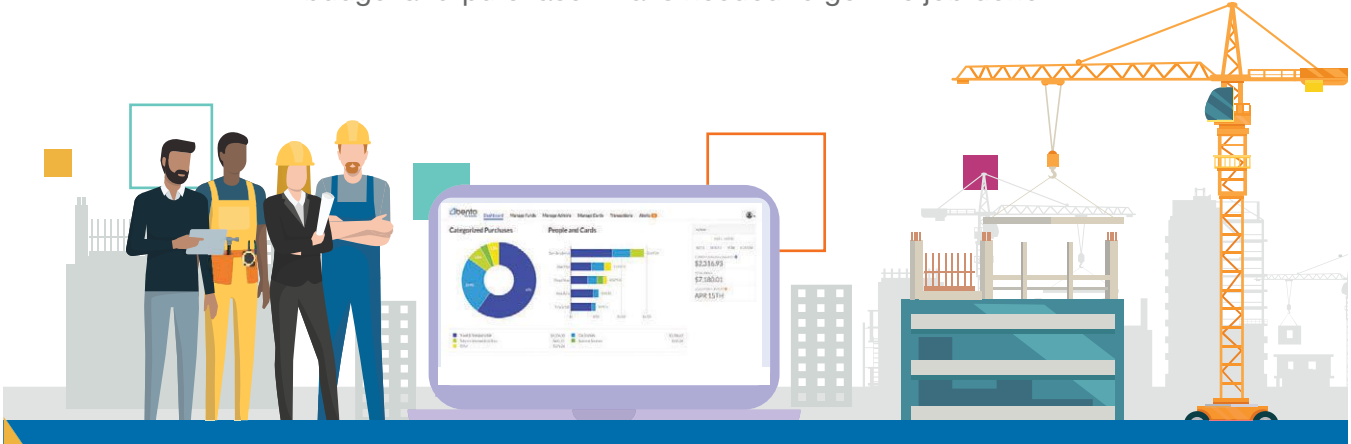
**Bento for Business**
**866-220-8465**
**info@bentoforbusiness.com**
**bentoforbusiness.com**

---

bento for business

## Control your expenses. See your spending. Grow your business.

Construction companies trust Bento as the go-to platform to easily control and report expenses. Give field crews Bento debit cards to stay on budget *and* purchase what's needed to get the job done.



Learn how we can help you at **BentoforBusiness.com | 866-220-8455**

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# bidadoo Inc.

*Bringing the auction to you*



Companies are always trying to improve the way they market, sell and maximize the returns of their used equipment and fleets. Transporting items to a traditional, land-based auction can be wasteful in time, travel and unnecessary expenses. It's simply inefficient versus going online.

In reaction to these inefficiencies, savvy equipment buyers and sellers have turned to the power of the internet and the efficiency gains of online auctions. With 180 million active buyers, eBay is the world's largest online auction marketplace.

bidadoo provides professional remarketing for used construction equipment, rental fleets, trucks and other capital assets utilizing eBay's effective auction platform, global reach and trust.

Simply put, bidadoo brings the auction to you—by bringing online bidders to equipment that can be left at owners' sites. With detailed condition reports, video demonstrations and quality photos, bidders can effectively "kick the tires"—without having to travel and see a machine in person.

bidadoo works with some of the largest equipment owners in the world for its auctions, including Sunbelt Rentals, Herc Rentals, H&E Equipment, JCB, Genie/Terex—top equipment dealers—The Boeing Company, the City of Seattle, and many other municipalities, government agencies, and sellers.

"bidadoo and eBay continue to change the way heavy equipment has traditionally been bought, sold and auctioned. Like many traditional retail brick-and-mortar models, we see the continued migration of both buyers and sellers to the more efficient online model," said Howard Hawk, bidadoo president.

**bidadoo Inc.**
**206-442-9000**
**info@bidadoo.com**


We bring the auction to YOU



Weekly Online Auctions with bidadoo®

With bidadoo, buying and selling equipment has never been better. As eBay's largest and most trusted online equipment and truck seller - we make buying and selling fast, efficient, and effective. For sellers, our appraisal services, competitive rates, and global remarketing make bidadoo a great auction partner!

www.bidadoo.com 1.877.bidadoo info@bidadoo.com

Check 106 on index.

# Carlisle TyrFil

*Good tire technology supports better on-the-job safety & productivity*

Nearly every busy construction site is comprised of multiple moving parts that can make or break the success of any project. When off-the-road (OTR) tires don't function properly, not only does that essential equipment come to a grinding halt (stopping jobsite productivity and potentially sending operator profit margins spiraling), but a tire flat or blowout can seriously hinder worker safety and hasten wear, tear and premature denigration to costly OTR equipment.

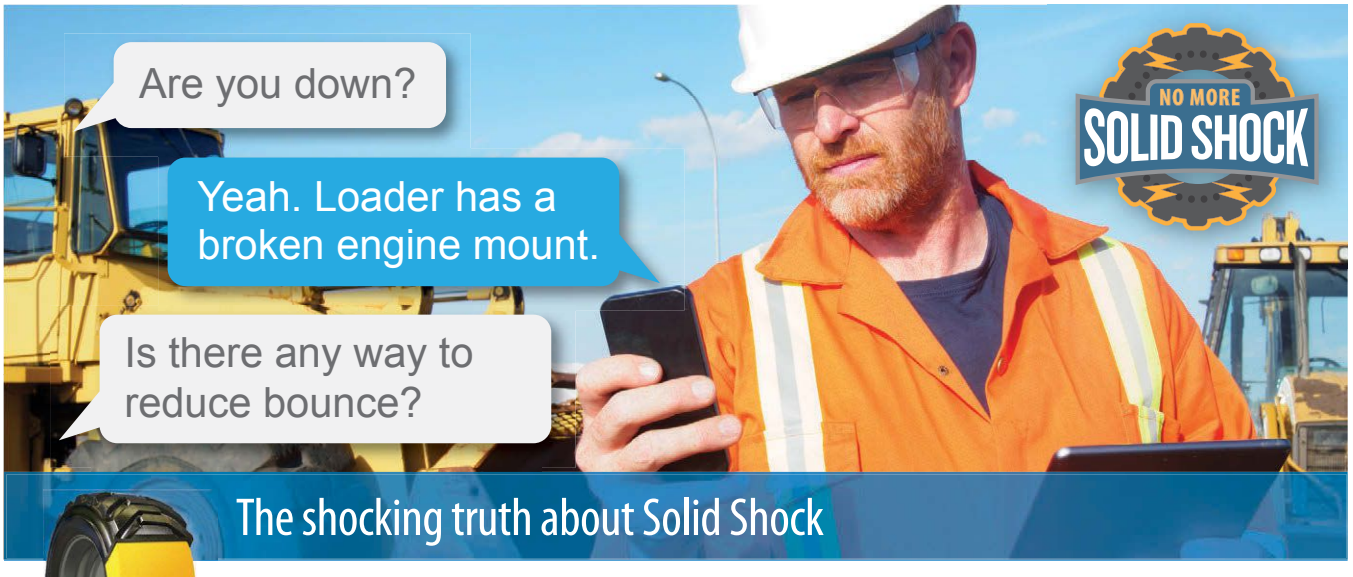
OTR heavy vehicles are continually at risk for tire flats, which incur unnecessary expenses. A pivotal part of effective operation depends on the ability to ensure that OTR tires are flat-proof at all times. Using tires filled with polyurethane tire fill—also known as "foam fill"—can be a game changer for preventing injury and eliminating equipment downtime.

First, filled pneumatic tires can easily glide over rocks, glass, sharp objects, rebar and other dangerous debris, literally without incident. Tire fill ensures that tires remain flat-free, and its versatile durometer options let operators choose the right product for each application. Second, filled pneumatics deliver a smoother and less bumpy ride for operators than solid aperture tires, reducing G-force



impact of "whole body vibration." TyrFil flat proofing can save builders time and money. Visit carlisletyrfil.com to find a dealer near you.

**Carlisle TyrFil**
**800-821-4147**
**contact@carlisletyrfil.com**
**carlisletyrfil.com**




Keep going.
Go **TyrFil.**

**"Solid Shock"** is the impact of excessive g-force vibrations transferred to heavy vehicle operators and equipment from solid aperture tires. Not only is Solid Shock a major source of wear and tear on machines, it can lead to operator injury.

**No More Solid Shock**

- TyrFil™, a polyurethane material, is pumped into OTR vehicle tires, replacing all the air.
- TyrFil cures into a flexible, durable filling that eliminates flats and acts as a shock absorber, providing a smoother, safer, flatproofed ride.

TyrFil™ A CARLISLE BRAND

(800) 821-4147 • accellatirefill.com

Check 108 on index.

# Corecon Technologies Inc.

*One is a powerful number*



When considering construction software, one broad and deep solution, rather than various disparate programs, is the most efficient and affordable choice. Doing more with less is a common ideology in most business sectors, and construction is no exception. A labor shortage plaguing the global construction workforce is further driving this lean mindset.

Astute construction business owners know their success is dependent upon meticulous management of assorted moving parts and people. Choosing a comprehensive software solution that increases efficiency and enhances internal and external team collaboration is key to maximizing profitability and outperforming the competition.

With an abundance of solutions available in the construction industry, it's imperative to choose digital tools wisely, focusing on proven solutions that drive value. Cutting-edge technology that streamlines construction operations by leveraging mobile devices and cloud services that boost productivity and eliminate waste achieve this goal.

Corecon Technologies' flagship product, Corecon V8, is a true cloud-based software suite. For nearly 20 years, Corecon has empowered construction business owners with a holistic approach to automating construction operations. Touching all aspects of construction operations—from business development through project closeout—the comprehensive platform includes modules for lead tracking, estimating, project management, job-cost control, scheduling, quality control and safety. Corecon also integrates with accounting software and has online team collaboration functionality via its TeamLink Portal.

**Corecon Technologies Inc.**
**866-258-6698**
**sales@corecon.com**
**corecon.com**





Check 109 on index.

# Diesel Laptops

*Diagnostics done right*

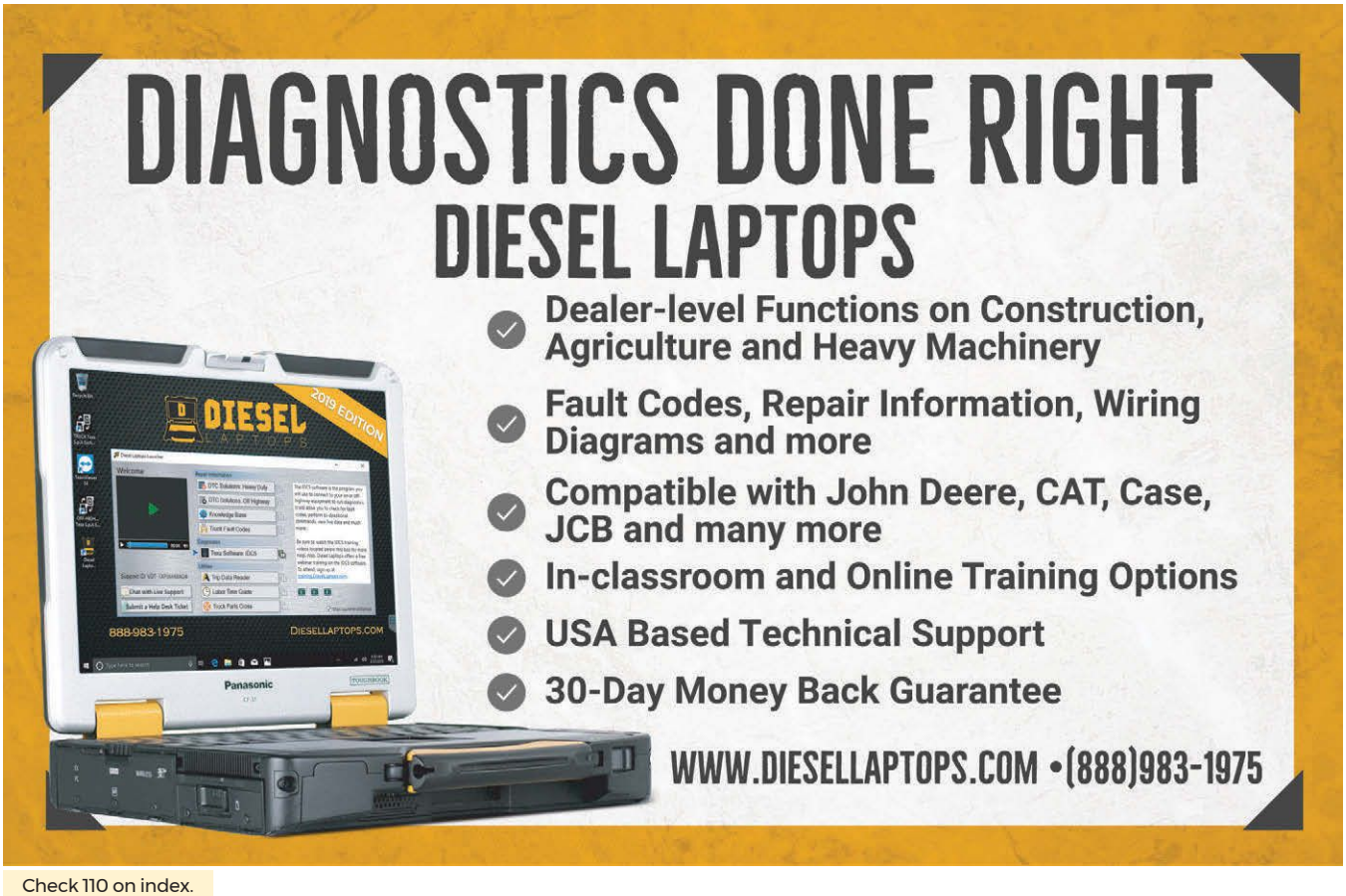



With Diesel Laptops' groundbreaking diagnostic tools, there are finally options besides original equipment manufacturer (OEM) software that let you do dealer-level functions on construction, agriculture and heavy machinery brands, including CAT, John Deere, Case, JCB, Komatsu and more.

Diesel Laptops' cutting-edge, plug-and-play equipment allows you to read fault codes while accessing repair information, wiring diagrams and even offers unmatched United States-based technical support from certified diesel technicians and information technology (IT) specialists. Diesel Laptops offers in-class and online training on a variety of important industry topics as well, including aftertreatment, electrical diagnostics and specific tool training. This means lower repair costs, less time waiting on OEM repairs and more equipment uptime. All of this, coupled with a 30-day, money-back guarantee, makes this tool a no-brainer for your business.

Diesel Laptops came on the scene in 2012 as a small operation selling diesel diagnostic tools on eBay from Chief Executive Officer and Founder Tyler Robertson's garage. Today, it is the second-fastest growing company in South Carolina and a leader of providing diagnostic products, services and repair information to commercial truck, construction, agriculture, marine and automotive markets.

**Diesel Laptops**
**888-983-1975**
**angaeli@diesellaptops.com**
**diesellaptops.com**




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# Double Coin

*Get the most value out of your tires*



With construction forecasted to slow down and off-the-road (OTR) tire costs expected to increase, Double Coin suggests you create a maintenance plan to maximize the performance of your investment. It begins with getting the right tire for your application. Double Coin's REM2 E3/L3 comes in two different speed ratings. The L3 is for loading and operates at slower speeds. The REM2 E3 is built for higher speeds and longer distances. Each tire has the same tread pattern, but is designed with different compounds to be the most productive tire for an application. Here are a few recommendations to include in your plan:

- Establish OTR best practices in order to maximize tire performance.
- Require equipment to operate within a tire's parameters.
- Have personnel trained to properly inspect OTR tires daily for defects.
- Create a tire maintenance schedule.
- Determine when tires should be serviced, retreaded or discarded.
- Train operators to notice hazardous tire defects. Defects include cracks, exposed cords, punctures, blisters, bulges, cuts and tire separation.
- Operators should inspect rims daily. Damaged rims can also lead to tire failure.
- Operate OTR tires at their correct air pressure.
- Make sure tire pressure is correct for the load being carried.
- Consider installing tire pressure monitoring systems.
- Remember that tire failure can lead to loss of control and create a safety hazard.

**Double Coin**
**888-226-5250**
**info@doublecointires.com**
**doublecointires.com**





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# eMars Inc.

*Users report 80% productivity improvement*



One-hundred fifty-six skilled tradespeople are working on the jobsite. Seven trades are represented. Forty-two people from six trades are working overtime this holiday weekend. There are 35 possibilities for each worker to be paid ... incorrectly.

Your accountant is leaving at noon on Wednesday to go to a business function and won't return until next Monday. An incorrect payroll check can lead to a fine or another penalty.

You are leaning back in your chair—at ease—because you have Compliant Client by eMars. Every submitted payroll is audited, online, in real time, against the wage determination and all 35 causes that are in support of Davis-Bacon and related acts.

This system is a web-based, certified, prevailing wage, accuracy system that requires no installation or maintenance of software. Immediate prompts alert the user how to solve the problems and guarantee compliance.

Designed with input from the Department of Labor (DOL), agencies and contractors, this system is user friendly. Custom plans are designed for each contractor. There are no other charges for renewal, mapping, training or startup.

eMars Inc.'s more than 15,000 clients have not had any random DOL audits for the past 3 years. Spending time and money worrying about a compliant payroll? Compared to paper and pencil preparation, eMars Inc.'s guaranteed system represents an 80% productivity improvement, plus instant recognition of payroll errors.

**eMars Inc.**
**480-595-0466**
**woodychamberlain@wh347.com**
**emarsinc.com**




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# Minnich Manufacturing

*High-quality solutions for concrete contractors*



Minnich Manufacturing, manufacturer of concrete vibrators, vibrator monitoring systems and concrete dowel pin drills, is dedicated to helping contractors maximize quality production.

Minnich's Stinger and M-Box are just two examples of how the company's concrete vibration innovations help its customers.

The light-yet-rugged Stinger electric flex shaft concrete vibrator is a 14.5-pound, double-insulated universal motor that can drive the full line of Minnich vibrator shafts and heads from three-quarters of an inch to two-and-a-half inches. Available in a 15-amp (115-volt) version, it offers a more compatible speed range of 11,000 to 13,000 vibrations per minute (vpm) to meet all of today's concrete placement challenges.

The M-Box high-cycle vibration control solution is an innovative control speed high-cycle power converter that enables high-cycle vibrator operators to control the speed/vpm of up to two vibrators.

Minnich will continue to bring products to the industry that support the findings of concrete research facilities across the country, including an innovative new flex shaft solution coming in 2020.

With new features making the product more efficient than others on the market, contractors can turn to Minnich for high-quality solutions.

**Minnich Manufacturing**
**419-903-0010**
**sales@minnich-mfg.com**
**minnich-mfg.com**


Minnich Manufacturing

LIGHT HAS NEVER BEEN TOUGHER

The Stinger motor has been designed to hold it's torque in concrete under load, runs cool, and saves on vibrator head wear and tear. Rugged, agile, and dependable. A combination only found in a Minnich flex shaft vibrator.




Minnich CONCRETE VIBRATORS & DOWEL PIN DRILLS

Explore Our Entire Line of Vibrators WWW.MINNICH-MFG.COM

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# Morooka USA

*Rubber track carriers made in America*



Morooka USA manufactures the largest and most popular carriers in the Morooka range in facilities in Mechanicsville and Ashland, Virginia. This assures customers of product quality and suitability for the particular needs of the North American and South American markets. Availability of parts and other aftermarket services are also important pieces of the puzzle, and knowing that they are readily available and nearby is another reason customers choose to deal with Morooka USA.

Morooka USA's sister company, Dominion Equipment Parts LLC, is one of the country's leading providers of aftermarket rubber tracks, undercarriage components and Morooka parts, with eight warehouse locations in the United States and Canada.

Morooka America is celebrating the production of its 1,000th all-American-made rubber-track carrier. Masami Morooka, president of Morooka Japan, plans to join Morooka America at the 2019 International Construction & Utility Equipment Exposition (ICUEE), in Louisville, Kentucky, to mark the achievement.

Designed specifically for the North American market, the MST2200VD rubber-track dump truck's versatility has made it the most popular model among its pipeline and construction industry customers. It is one of 18 American-made rubber-track carriers in the Morooka America product lineup from just six in 2012, the year the company was founded.

**Morooka USA**
**877-667-6652**
**cunger@morookacarriers.com**
**morookacarriers.com**




Check 111 on index.

# Scaffold & Access Industry Association (SAIA)

*Providing a wealth of scaffold & access knowledge to the construction industry*

Since its founding in 1972, the Scaffold & Access Industrial Association (SAIA) has worked to ensure those who make, install, depend on or govern the use of scaffold and access equipment pursue the highest standards of safety, craftsmanship and ethics. Construction business owners can rely on the SAIA to:

- Offer opportunities for networking and the exposure they need to build new business connections through the Annual Convention & Exposition, Committee Week, training and trade events
- Lead the advancement of safety in the industry, utilizing resources, education and communication
- Promote best practices that help their workers go home safely to their families every day
- Invite their participation as standards and practices are updated to stay relevant in the face of constantly emerging and evolving technology
- Advocate on their behalf with governmental agencies and provide the latest legislative news on state and national issues
- Develop and support alliances with regional, national, and global partners, such as Occupational Safety and Health Administration (OSHA)
- SAIA members come from all sectors of the scaffold and access industry. Collectively, they provide a wealth of scaffold and access knowledge that helps business owners to run a safer and more profitable company.



**Scaffold & Access Industry Association (SAIA)**
**816-595-4842**
**brandi@saiaonline.org**
**saiaonline.org**


SAIA SCAFFOLD & ACCESS INDUSTRY ASSOCIATION

## GET YOUR NAME IN FRONT OF PROSPECTIVE CUSTOMERS

**Invest in the growth of your business with a membership in the SAIA.**

When you join the Scaffold & Access Industry Association (SAIA), you'll gain exclusive access to hundreds of potential new clients and increased exposure for your company.

Our members are looking for your products and services, and they want to support and do business with other members.

The SAIA offers multiple opportunities throughout the year for you to meet and network with this niche market, including

- Committee Week
- Annual Convention & Exposition
- trade shows and regional events

We can also help you build your brand and boost visibility for your products/services:

- advertise in our official publication, SA Magazine – distributed to more than 6,000 readers in 20+ countries
- reach your target audience with customized meeting and event sponsorship packages – tailored to fit your specific marketing and budget needs
- showcase your products and services to key decision makers when you exhibit at the annual convention

SAIA members also get these benefits:

- discounts on training courses, event registrations, and purchases in the online store
- a members-only portal featuring an expanded resource library, online member directory, and a job board
- the chance to make a difference in the industry by serving on one of our councils or committees

**JOIN TODAY AND WE'LL WAIVE THE $100 APPLICATION FEE!**

Call Brandi Fox at 816.595.4833 and mention promo code **CBO1019** to get started with your SAIA membership.



**WWW.SAIAONLINE.ORG**

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# Stellar Industries Inc.

*Real-world situation testing takes aluminum bodies to the next level*



Stellar Industries Inc. was founded in 1990 in Garner, Iowa. Products include telescopic cranes, articulating cranes, hook-lift hoists, cable hoists, container carriers and work-truck accessories. Stellar also offers mechanic service truck and tire service truck packages.

The Stellar TMAX Aluminum is the latest design in the TMAX Series of service bodies. With a market demand for lighter solutions that combat corrosion, these aluminum bodies are 780 pounds to 1,440 pounds lighter than their steel counterparts, while still incorporating the Torq-Isolator understructure for durability and performance.

The TMAX Aluminum Series features the industry's first aluminum extrusion compartment top. The extruded top is formed of high-strength aluminum and features two built-in accessory mounting rails that eliminate the need to drill holes in the compartment tops to mount equipment. The advent of the built-in accessory mounting rails makes mounting and relocating accessories simple, while greatly reducing the chance of water intrusion into the compartments. The bodies also come with many of the same standard features as the steel counterparts. This includes billet-style stainless steel hinges, three-point compression locks, double-panel doors, and double-spring, over-center door closures.

"Stellar is using its unique core competencies to bring steel and aluminum together to make the ultimate heavy-duty, yet lightweight, body," said Tim Davison, product manager at Stellar Industries. "We made sure we tested this body in real-world situations taken to the extreme. We want to prove to the customer that we built a fantastic product."

**Stellar Industries Inc.**
**800-321-3741**
**sales@stellarindustries.com**
**stellarindustries.com**




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# Sullair - A Hitachi Group Company

*Portable air compressors backed by reliability, durability & performance*

The Sullair portable compressor fleet is ideal for tackling a variety of general building and road construction applications. The Sullair portable compressor lineup offers a range of sizes, pressures and flows available from 185 cubic feet per minute (cfm) to 1600 cfm and 100 pounds per square inch (psi) to 500 psi. Sullair also offers electric portables, rental packages and a line of construction air tools.

**MANUFACTURING DRIVEN BY THREE PILLARS**

Sullair was founded in Michigan City, Indiana, in 1965. Today, it continues to serve customers in nearly every corner of the globe through its extensive global distributor network.

Sullair compressors are manufactured with three pillars driving the quality: reliability, durability and performance. It's a promise Sullair keeps with every machine it makes.

Bulletproof. Built to last. Whatever way you spin it, Sullair compressors are in it for the long haul, driven by the design of the legendary air end. Proof can be found on jobsites around the world—from construction to mining and more.

You will find Sullair compressors delivering longer run times and increased productivity day in and day out.



**Sullair - A Hitachi Group Company**
**800-785-5247**
**sullairsolutions@sullair.com**
**sullair.com**




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# Thunder Creek Equipment

*Achieving ultimate efficiency through fueling*




The city of Denver, Colorado, has a litany of hand-picked asphalt milling projects that Colorado Milling tackles. Just one of the company's mills burns between 100 and 200 gallons of diesel each day. Combine that with the fuel burned by loaders, dump trucks and other equipment, and that translates to a need for fueling efficiency. Chris Vorhies, owner of Colorado Milling, invested in a 920-gallon Thunder Creek Equipment Multi-Tank Trailer to solve his fueling challenges. The Thunder Creek MTT is designed to transport up to 920 gallons of diesel over the road, without the need for a hazardous materials (HAZMAT) vehicle or, in many cases, a commercial driver's license (CDL), saving Colorado Milling the cost of paying a more accredited driver and the additional insurance of a HAZMAT vehicle.Additionally, Colorado Milling's MTT is equipped with a two-in-one, 100-gallon diesel exhaust fluid (DEF) system that both pumps DEF in and out in a closed system. Since the company's asphalt mills all require DEF, the Thunder Creek MTT has massively reduced the time, hassle and risk of contamination associated with refilling with other containers.

"We're not running around with 5-gallon jugs in the back of our service trucks," said Vorhies. "That was a pain. The Thunder Creek trailer has streamlined everything. Now one vehicle can take care of all the equipment, as far as fuel and DEF."

**Thunder Creek Equipment**
**866-535-7667**
**connect@thundercreek.com**
**thundercreek.com**




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# Yamaha Power Products

*Power equipment & multipurpose engine manufacturing & sales*



Yamaha Power Products, a division of Yamaha Motor Corporation USA, with facilities based in Kennesaw, Georgia, is a leader in the power equipment and multipurpose engine business in the United States. Yamaha Power Products has been manufacturing and retailing generators since 1973 and introduced its first inverter generator, the EF2800i, in 1998.

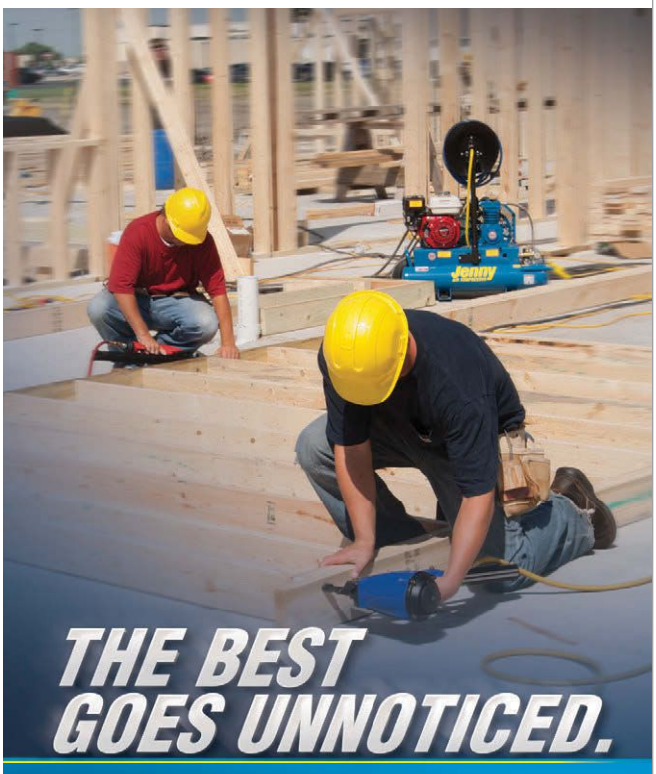
Yamaha Power Products produces a complete line of durable, versatile power products, including a variety of inverters, generators, pressure washers and pumps. Yamaha recently expanded its U.S. product offering with a full line of fuel-injected and carbureted multipurpose engines focused at the ever-expanding lawn and garden market. Yamaha generators, pressure washers and pumps are designed and built with the customer in mind. Yamaha Power Products provides quiet, durable, reliable power output backed by a 3-year warranty.

Every inverter, generator, pressure washer and pump in the line is powered by a Yamaha Overhead Valve (OHV) air-cooled, single cylinder, four-stroke engine, resulting in noise-reducing operation, improved efficiency, increased reliability and low oil consumption. Yamaha multipurpose engines are designed for high fuel efficiency, without sacrificing performance to increase zero-turn (ZTR) lawnmower run time. Using feedback from the ZTR market, Yamaha multipurpose engines are built from the ground up with a focus on power, torque, reliability and simple serviceability.

**Yamaha Power Products**
**866-788-7398**
**powerproducts@yamaha-motor.com**
**yamahamotorsports.com/powerproducts**




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# Jenny Products Inc.

*Reliable equipment for the long term*



Jenny Products has been producing reliable, American-made air compressors for more than 90 years. Job after job, year after year, Jenny compressors stand the test of time. Simply put, Jenny compressors are built to take a beating on tough jobsites and consistently come back for more.

Jenny's complete line of portable air compressors is well known for longevity, with several features included to reduce maintenance and maximize uptime. Available electric or gas-powered compressors range in air tank size from 1.5-gallon, hand-carry units to 30-gallon wheeled machines and even 80-gallon service vehicle compressors.

Unfortunately, many compressors on the market aren't built to the same level of quality. Instead of components made from heavy-duty metal, they may use plastic shields and guards. Grease fittings may not be protected. And, if the compressor is belt-driven, the belt might not be fully enclosed.

Jenny compressors feature cast-iron pumps or belt drives with large flywheels and special unloading valves for easy startups and extra cooling, along with a directional air shroud to further reduce pump temperatures. Splash lubrication with Jenny Ultimate Blue compressor-pump oil offers contractor-duty protection of pistons, crankshaft, bearings, rings and cylinders.

Other standard protection features across most Jenny models include a totally enclosed belt guard, protectively mounted fittings, a stainless-steel braided discharge hose, a large canister intake filter with replaceable filter elements and a pressure-release safety valve.

**Jenny Products Inc.**
**888-425-3669**
**dleiss@steamjenny.com**
**jennyproductsinc.com**

# Mi-T-M Corporation

*The builder's choice of air compressor/ generator/welder combination*



With cost efficiency and time management at the top of everyone's mind, many companies are engineering products to better suit their customers' needs, and Mi-T-M Corporation is among them.

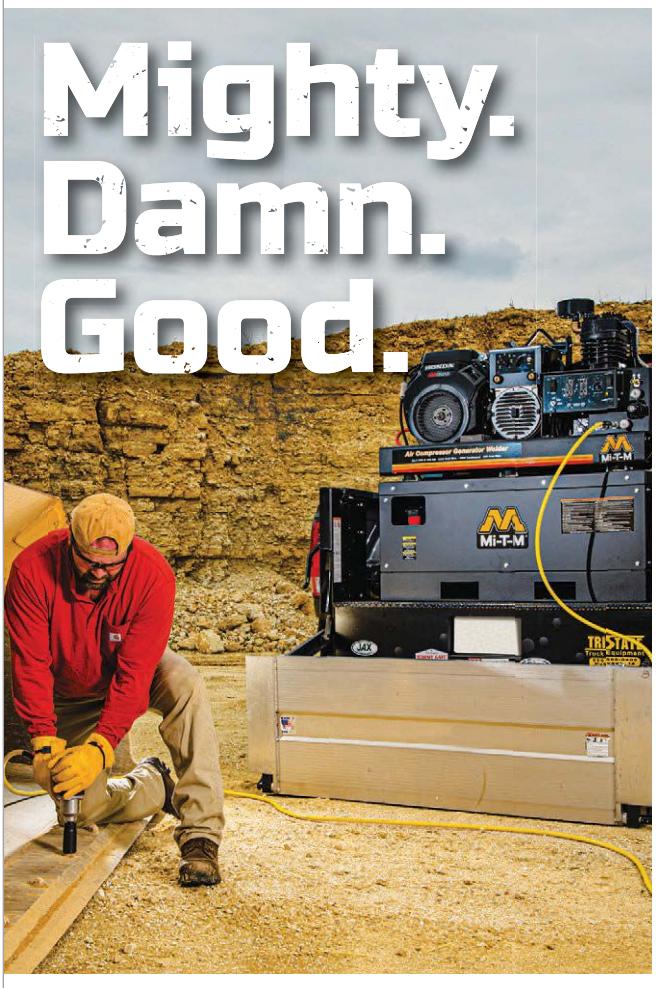
The Mi-T-M AGW Series (a compressor/generator/ welder combination) is the complete, on-site workshop for construction, structural steel and equipment repair professionals. A job that once required the need for three machines can now be done more efficiently and faster because of this one piece of equipment.

Mi-T-M's combination units are trendsetters in the industry, "Customers no longer need to load their work vehicles or maintain three individual machines," said Dana Schrack, vice president of Mi-T-M. "This product not only saves time, but it also saves money in the long run."

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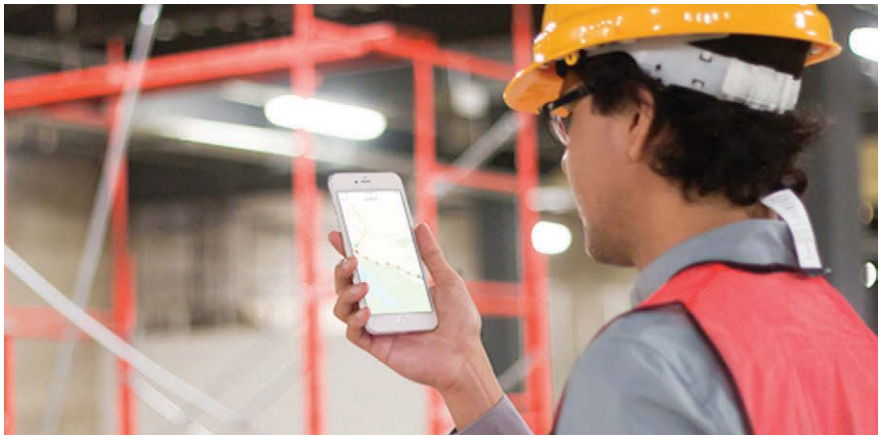
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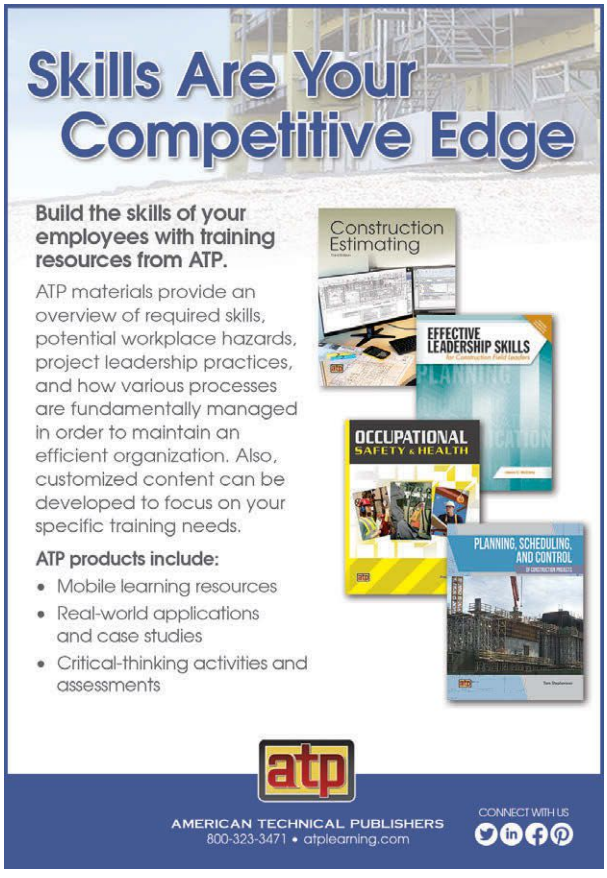
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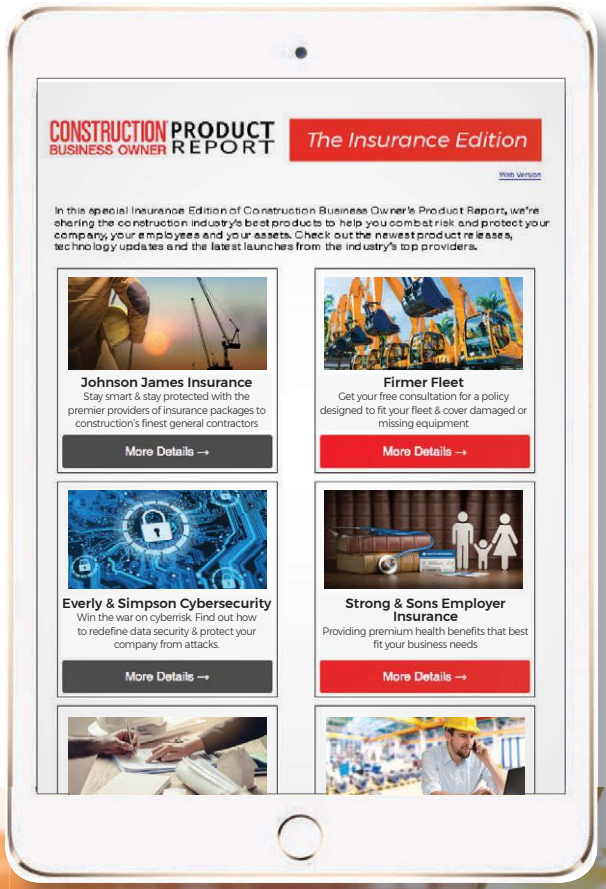
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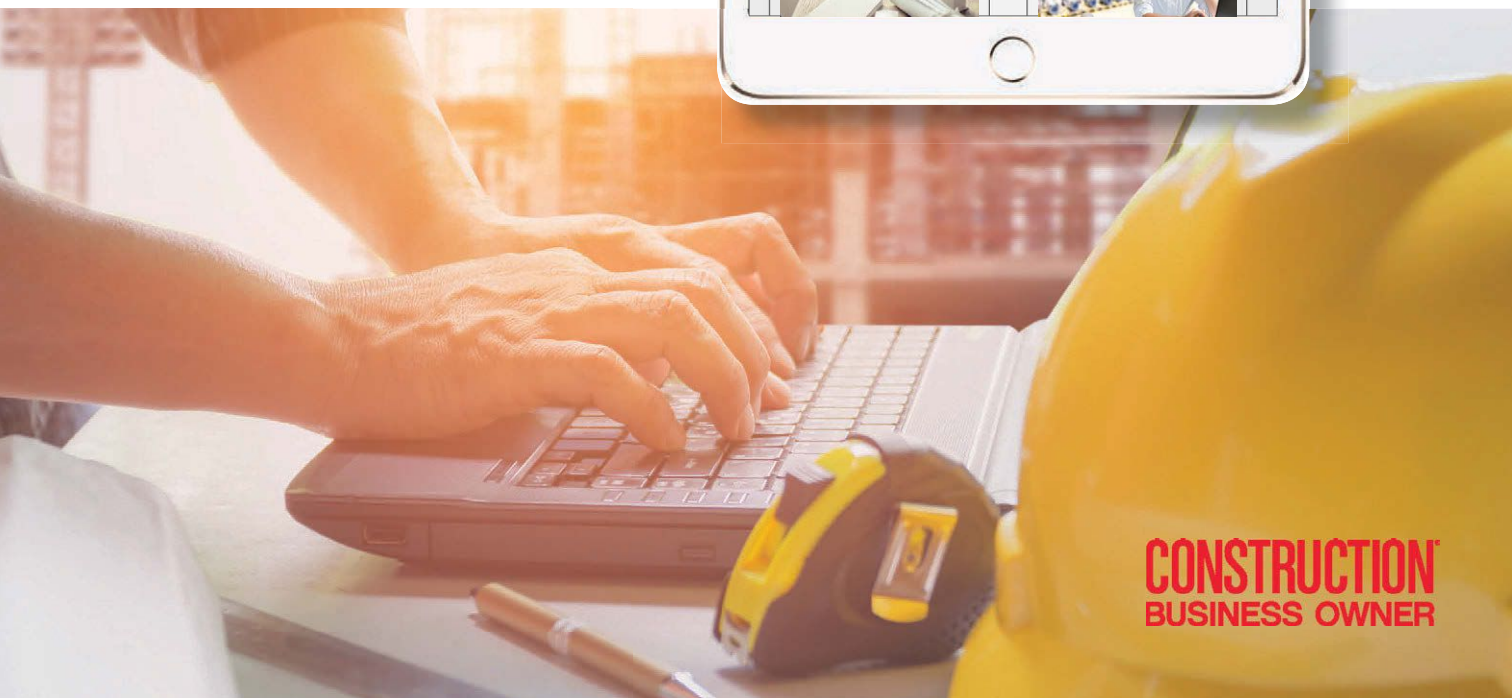
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CONSTRUCTION BUSINESS OWNER

## Owner & Site-Work Specialist

# MICHAEL MACURA JR. ON WHAT FUELS HIS SUCCESS



The background and experience Michael Macura Jr. brought to his startup company in 2013 looked like a blueprint for success. He grew up in the site-work business—his father was in the construction industry for more than 25 years. Macura had a degree in engineering and 7 years of experience as a construction manager. But most of all, he had a real passion for the industry.

"As early as I could sit in an excavator seat, I was running one, and it has been a part of my life ever since," Macura said. "My passion for this type of work has driven me to continue to succeed and grow."

Just as important as his passion for construction, he had a solid business plan. For the most part, he stuck with the plan; when he got off track, he learned some valuable lessons. Today, Macura Excavating, headquartered in North Grafton, Massachusetts, is a well-established site-work subcontractor.

"Starting this business from the ground up was a challenge," he said. "Our name was well-known throughout the Metro Boston area, thanks to the work of my father (Mike Sr.). I was able to piggyback on some of his longtime relationships, which made it easier to break into the business. But, right from the start, I wanted to operate a different type of company. My focus has always been on commercial projects in various industries in lieu of residential."

"[At Macura Excavating], our No. 1 goal is to deliver a quality product to our clients and provide a safe work environment for our employees. When we sign a contract for a project, we are committed to delivering that project on time, safely and on budget," he said.

Macura admits he still has plenty to learn as new challenges surface regularly. "I've had my ups and downs, but I don't regret anything I've experienced," he said. "As long as you keep your head down, continue to move forward, and have the drive to be successful, then you will be."

When asked to share his advice on getting into the construction business, buying equipment and being successful, he passed along some ideas from his original plan, as well as adjustments he made along the way.

### 1. BE STRATEGIC ABOUT PURCHASING DECISIONS.

When Macura makes decisions about equipment acquisitions, he first identifies how the piece of construction equipment can make his company productive and profitable.

"Owning excavators and loaders is the clear bread and butter of what we need to perform our work," Macura said. "However, we also analyze where our outsourced expenditures are, weigh the ownership and operating costs, and determine if it is a profitable investment to increase our bottom line."

In 2018, Macura and his team determined the company could improve what it was spending on trucking—both exporting spoils from sites and importing aggregate to sites.

"We invested in a tractor-trailer dump, instead of a triaxle or 10-wheeler dump, to minimize the cost per ton to move material," Macura said. "Also, we elected to purchase a tractor so we could purchase a lowboy trailer to move our equipment in-house. The purchase of the tractor served two purposes for us."

Another area in which Macura identified an opportunity to improve his company's efficiency was the amount he was spending on processed gravel, structural fill, sand and stone purchased from local pits.

"We made the decision to invest in a jaw crusher and scalping screener," he said. "After doing so, we are now able to utilize every type of soil we encounter on a jobsite. We can crush rock and make it into structural fill. We can screen common fill and make it into pipe bedding."

"Lastly, we can use both the crusher and the screener to make dense graded stone, crushed stone and sand," he said. "This has helped us be more competitive at earning work, but it took a long time to be in the position to ensure our sales and volume were at the correct level to justify the investment."

## From Manager to Owner

Before starting his own company, Michael Macura Jr. spent 7 years as a construction manager— experience he wouldn't trade for anything.

"It made the transition into running my own firm easier than I expected it would be," he said.

In building a job from the ground up and handling the subcontracting work, Macura says he learned how the industry works; how a job is planned, bid, executed and closed; the dynamics of what occurs during a job; specific project controls; and how to communicate with people and settle disputes.

"That really helped me when I jumped to the other side of the fence," he said. "Even though my role was different, I knew how the game was played, and that enabled me to do a better job of doing things correctly the first time."

### 2. CAREFULLY CONSIDER RENTING OR BUYING.

Which equipment he uses for a particular job can be very important to Macura's bottom line, and it may vary from job to job, depending on the type and size of the project.

"The question of rent or purchase always comes to the forefront when you are in need of additional equipment beyond what

your fleet has," Macura said. "'Will I be able to keep this machine working?' and 'Do I anticipate a steady flow of work in the future to maintain or exceed current sales?' are questions always at the forefront when determining if purchasing a piece of equipment is the correct decision."

The key, according to Macura is keeping the machine working. "If the machine is working, it's contributing, and that equates to savings and efficiency," he said. "You need the correct equipment to be productive, but you don't need the burden when it is not contributing. Typically, when we do not have enough equipment to meet our job needs, we elect to rent equipment that we do not use at least 75% of the time on a jobsite. Generally, this is dozers, vibratory rollers and off-road rock trucks."

As far as financing the equipment, Macura said, "Have a financial plan. Don't buy a bunch of equipment because you think you are going to have work—only buy what you need. Look for equipment that is productive, with good pricing, warranty and dealer support."

A big part of Macura's early success was a partnership with his local dealer—Equipment East LLC in Dracut, Massachusetts.

"Initially, I rented a number of different brands of excavators and wheel loaders, including machines from Equipment East, our local dealer," Macura said. "When I could afford to purchase equipment, I contacted dealers representing various top brands in the industry. I was originally attracted to Equipment East because of its dealer support, financing options, warranty and, most of all, purchase price. I would not be where I am today without the support of Equipment East, especially Dan Clifford, who has been a great friend to the Macura family for many decades."

Macura owns multiple crawler excavators and wheel loaders for site preparation tasks, including bulk cuts and fills, and excavating for new office buildings. On a project in May 2019, he combined multiple excavators, wheel loaders and an articulated dump truck to complete the earthwork on a new, 11-acre commercial project.

Fuel efficiency, according to Macura, is one area in which the machines have improved in recent years. "Operate them in the right mode and you will experience very good fuel efficiency," he said. "That affects the bottom line on every job."

### 3. BE EFFICIENT IN EVERYTHING YOU DO.

"Every little bit counts—even the smallest thing is important," Macura said. Some of those small things, he said, include:

- Staff the job with the right amount of people and the proper equipment for what you are doing.
- Develop relationships with as many people as you can in your local construction market, from civil engineers to developers.
- Stay constantly engaged in what's going on. Spend time doing the work, but also set aside a good portion of your time for business development.
- Always keep building a backlog of work.

"Have a financial plan. Don't buy a bunch of equipment because you think you are going to have work—only buy what you need. Look for equipment that is productive, with good pricing, warranty & dealer support."

### 4. FIND YOUR NICHE.

"Look for the right size jobs that you can do efficiently and profitably," Macura said. "I don't dabble in things I am not good at. Don't take on large public jobs if you do not have experience in large public jobs. Don't take on small residential work if it's not going to be profitable. This is one area where I've made some improvement in how I manage the company."

"Continue to build equity in your company by reinvesting profits back into the business. Over time, that will make your firm more stable and allow you to add capital and resources," he said.

### 5. PICK THE RIGHT CLIENT & THE RIGHT JOB.

"Don't try to do everything," Macura said. "I've done that and paid the price. When I was concerned about maintaining a volume of work, I panicked and took on some work that I should have avoided. Sometimes, you are better off sitting at the office and waiting for the next job rather than taking on a job you will regret."

"Of course, when you are just starting out, that is sometimes easier said than done," Macura said. "Being a new business forces you to make decisions to keep revenue up and overhead and operating costs paid every month. I would have been in a better position to pass on suspect jobs if that aspect of the business had not been such a financial burden."

Not only is it important to pick the right project, but when it comes to clients, Macura said it's crucial to know who you are working for. Whether you're a contractor or a subcontractor, Macura said, "Gather references for people who are going to hire you. You will be investing a lot of time and money financing the job, and you need to be confident that you are going to get paid for your work in a timely manner." CBO

*Ryan Johnson, APR, works for Two Rivers Marketing in Des Moines, Iowa, representing clients in the construction equipment industry, including Doosan Infracore North America LLC. A native Iowan and Drake University graduate, Johnson has more than 20 years of public relations experience. Visit doosanequipment.com.*



# HOW TO PROACTIVELY ADDRESS SERVICE ISSUES & PROBLEM INDICATORS TO GAIN SUBSTANTIAL SAVINGS

A contractor's equipment fleet consists of tools that get the job done, which enables the company to get paid. Whether the fleet is one- or 1,000-strong, replenished with new or used equipment, and sees high or low utilization rates, a productive machine is core to the business's success.

Equipment operating costs can vary greatly due to a variety of factors, including the severity of the application, how often the equipment is used and the amount of respect with which the operator treats the equipment. One critical owning/operating cost well within the control of the company—how well the equipment is maintained—can be the difference in operating costs of just under $1 per service hour or more than $7 per service hour.

"Our data shows that nearly 90% of machine failures are avoidable," said Mike Scott, senior parts and service marketing consultant for Caterpillar.

Dave Matranga, also a Caterpillar senior parts and service marketing consultant, added, "If a contractor addresses an equipment problem indicator early enough prior to failure, the fix can be scheduled, should cost less to repair and can extend the life of other supporting components. If the issue is left to fail, repair costs are significantly greater than if the issue is dealt with earlier."

Other than the unexpected failure, a contractor is in control of the interval and where the piece of equipment will be repaired or rebuilt. There may be some extenuating circumstances in which the contractor has to or chooses to run the equipment to failure, knowing full well that the repairs will cost more.

This is where developing a strong contractor-dealer relationship is critical for a company. Even before the first bucket of earth is excavated or the first wrench is turned on the machine, the contractor should consult with the dealer and explain the type of work anticipated, how strenuously the equipment will be used and how many life cycles are desired for the piece.

"It's no longer a one-size-fits-all world," said Tim Totten, solutions consultant for Caterpillar. "A variety of work factors should be included in the decision-making process, and the dealer offers a wealth of knowledge pertaining to equipment capabilities and specific market characteristics to help select the right model."

## TROUBLESOME INDICATORS

The reality of owning and operating construction equipment is that it will require maintenance throughout its life. The level to which the equipment is serviced will ultimately be determined by the owner. There are different types of indicators to alert the owner that the equipment requires attention.

Planned indicators are within the company's control to effectively and efficiently address, and one of the most common planned indicators is for maintenance performed by service meter units. The equipment's operating and maintenance guide offers general guidelines for these intervals based on the number of hours.

Routine oil and coolant system fluid sampling offers insight into internal component wear and potential failure. The data



gives important trends for these closed-loop systems and allows contractors to plan for component repair or rebuild. "Think of it like an annual blood test," said Matranga. "Much like abnormal findings in bloodwork need to be either monitored or addressed, trends like increased metal fragments in the oil give an owner the data necessary to make a proactive service decision."

Problem indicators, on the other hand, show up during operation, signaling that there is something failing within the machine. There are several different indicators, as Scott explained. "Items like black, blue or white smoke, increased oil consumption and overheating are all engine repair indicators; while brake slippage, vibration and leaks indicate a problem with the machine's final drive," he said.

Machine telematics data also can serve as an advanced warning problem indicator. In addition to machine utilization and location information, original equipment manufacturer (OEM) reporting programs capture data and give key personnel advanced warning about the condition of the equipment.

These problem indicators alert equipment operators and owners that a repair should be made soon, or an unexpected downtime event will occur. Whether and when these items are quickly addressed is up to the owner, but overwhelming evidence shows that repairing a machine problem before failure is significantly less expensive than waiting until after failure.

## REPAIR BEFORE FAILURE

There are worse negatives than higher costs associated with waiting until a failure to address a problem.

"High costs associated with repair after failure will often lead customers searching for lower replacement component cost alternatives," said Totten, "which may lead to other problems down the road."

Most manufacturers build equipment to last multiple lives. There are several levels of parts that will require repair or replacement at different intervals throughout the equipment's service life. Typically, the higher the level of part that requires repair, the higher the cost.

- *Level 1*—designed to wear and are not reusable. These include engine piston rings, exhaust valves, gaskets and seals. For the drivetrain, they include seals, gaskets and anti-friction bearings.
- *Level 2*—wear at a slower rate and are designed to be reused at a rebuild interval. These parts include the pistons, intake valves and fuel injectors/nozzles in an engine, as well as the drivetrain's plates, discs, gears and shafts.
- *Level 3*—designed to last the lifetime of the machine unless there is a component failure. Examples of these parts include the engine's block castings and crankshafts and the drivetrain's transmission cases and final-drive planet carriers.

"Once you start replacing Level 2 and 3 parts, the opportunity for the lowest cost per hour and lowest operating cost is lost," said Scott.

Matranga offers an example of service costs for a wheel loader to illustrate just how costly it is if repairs are not made before failure.

"The average overhaul time period for a medium wheel loader is approximately 14,000 hours and will cost approximately $12,000 to service if repairs are made before failure. This equals a service cost per operating hour of 86 cents," he said. "That same contractor could choose to ignore the planned and problem indicators and possibly extend the machine to 20,000 operating hours before overhauling the loader after failure. The projected cost for repairs, since Level 2 and 3 parts would have to be involved, jumps to nearly $53,000, or $2.64 service cost per hour."

## CAREFULLY CONSIDER ALTERNATIVES

As diverse as the reasons for why, when and where the machines are repaired, is the wide range of factors contractors have to consider before purchasing parts for the equipment. Some select solely OEM parts to get the maximum warranty coverage and life out of the part. Others are cost conscious, looking for a quick and convenient fix to get the machine running, and will look for an aftermarket solution. Many contractors fall somewhere in between these two extremes.

"Contractors will often look at where they are in the life cycle of the particular machine," said Totten. "They will consider how much and how often it's used and how long before selling off. If it's not a machine that is heavily used or relied on and they are not holding on to it, then they may go with an aftermarket part."

However, Matt Reeves, marketing and brand manager for Yellowmark, a Caterpillar brand, offers this caution about will-fit aftermarket parts: "While it's true that will-fit parts are made to fit, they have not been developed to operate as part of the manufacturer's system components and may not be built to the same standards or offer the same tolerances.

This holds especially true for machine components that receive high stress and high day-to-day use. Contractors may not get the expected life span out of the part, or, worse yet, the part could lead to the failure of other components in the system."

A growing trend among OEMs is to offer a "value line" of replacement parts that falls in between genuine OEM parts and will-fit aftermarket parts. "Not every contractor or situation requires a genuine OEM part," Reeves said. "These value lines will offer the same fit and function as the original part and will typically be backed by a limited warranty."

The advantage of parts offerings, since they are endorsed by the manufacturer, is that they are built to the same tolerances and work as part of adjoining system components. However, they may not offer as much durability or as long of a service life as the genuine OEM part does.

"These value lines are designed to be conveniently accessed, offer manufacturer-grade reliability and be purchased at a lower price than OEM parts," said Reeves.

## REBUILD/REMANUFACTURE

Contractors keeping up with preventative maintenance schedules tend to get the most life out of the components of the machine. When planned indicators like inspections, service history and oil sampling show that components are toward the end of their first life, contractors should address the rebuild prior to seeing an indicator.

"Often, that first rebuild will be a rebearing/reseal, replacing Level 1 wear components and offering the lowest cost option for the rebuild," said Scott.

The longer a contractor holds onto a piece of equipment and the service meter units add up, Level 2 components will begin to show signs of wear and will require either component rebuilding or remanufacturing. "The rebuild and remanufacturing processes are similar in the fact that the component is completely disassembled, cleaned and inspected," said Matranga. It's what happens after this stage that differentiates the two strategies.

These processes are intended to bring the machine's component back to its original expected life. The rebuilt component, typically handled by a certified equipment dealer, includes the original parts paired with new to replace the ones that are too worn. "Basically, the component keeps its identity, and the machine keeps its core," said Totten.

With the remanufacturing process, all the cleaned and reusable parts of the component go back to the manufacturer's assembly line to be rebuilt. "The component loses its identity and the machine its core," said Totten.

Despite this, contractors should expect to get another life from the component out of both rebuilding and remanufacturing. Additionally, the component also comes with the same warranty as if buying a new component.

The contractor keeping up with equipment maintenance and repairing problems before failure will experience one final benefit at the time of unit disposal, regardless of whether the machine is on its first or third life.

"A full history of performed maintenance and rebuilds will accompany the machine, and those units that were properly maintained will bring a higher resale value," said Matranga. CBO

*President of Z-Comm LLC, Rick Zettler is a writer, photographer, public relations and marketing consultant specializing in the construction, recycling, material handling, mining and road building industries.*





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**EQUIPMENT:** A Winter Walk-Around | By Chad Parker

# 5 MAINTENANCE POINTS TO PROTECT YOUR EQUIPMENT BEFORE & AFTER THE FREEZE

Whether or not you continue operating through the winter months, winterizing your construction equipment is crucial for protecting your investment in those machines and the future business they represent. Use the following as a checklist for your equipment walk-arounds this winter.

### 1. BATTERIES

If your construction equipment goes unused for a long period of time, you will need to properly store the battery away from frigid temperatures. Batteries can lose up to 35% of their power at 32 degrees Fahrenheit and as much as 60% at 0 degrees Fahrenheit. To prevent the battery from draining in the cold temperatures, you should test its voltage before storing it inside.

When the equipment is to be stored for long periods of time, it's a good practice to remove the batteries and store them in a protected building out of the weather. If they are serviceable batteries, test them to be sure that they are still serviceable, and, if so, add distilled water and place them on a trickle charger.

### 2. TIRES

Daily preventive maintenance for tires is a year-round job, which becomes even more important as temperatures begin to drop. During the winter months, check the air pressure of your tires and look for signs of wear and tear frequently. Tires tend to deflate quickly in colder temperatures—giving track-mounted equipment a winter advantage over tire-mounted equipment.

### 3. GREASE POINTS

Grease is the lifeblood of all pins and bushings. Grease all grease points thoroughly, making sure to have good coverage for winter. Don't forget to grease the axle hubs, too.

The operator's manual will identify each grease point and provide recommendations for quantity and grade of grease. If multiple operators are using a single machine, you can flag less obvious grease points with orange paint to remind all users to perform this task.

As with undergreasing, overgreasing can also be problematic. One to three shots of grease is typically plenty to do the job. Using more wastes money, presents a potential environmental hazard and can cause a considerable mess.

Once the unit is removed from storage, grease again. Grease can become hard and laden with moisture, so pushing the old out and purging with new will be sure to protect the machine.

### 4. FUEL & ADDITIVES

Using an anti-gelling additive in diesel fuel can improve your engine start-up in cold weather. This can also improve cold flow by preventing gelling and will even clean deposits from fuel injectors, combustion chambers and intake-valve deposits. These additives are readily available at any local dealership or service shop.

Change the fuel filters and fuel separator filters to be sure no moisture has been retained that might cause problems later on. Moisture in the engine can occur when the engine is hot and the outside temperatures are very cold. Moisture may especially form in the fuel when the equipment has been sitting and can occur as quickly as one weekend's time. If the fuel does begin to gel, it's quite possible that the gelled fuel will clog the fuel separator.

Construction equipment fuel tanks typically have a drain plug in the bottom. When the unit sits for any period of time, the water settles to the bottom of the tank, as it is heavier than fuel. So, remove the drain plug and drain the tank until water no longer comes out.

### 5. ENGINE OIL, COOLANT & HYDRAULIC OILS

Change the oils in your construction equipment before and after the winter months. During the winter, use low-viscosity oils that will flow with less resistance. This includes oils for the engine, transmission, differentials and hydraulic system.

Drain intervals are not dictated by hours but have a maximum time that the oil should sit. You should refer to your operator's manual, but a good rule of thumb is to drain oil after 12 months of accumulated time, even if the unit has been running.



Most diesel engines today come with glow plugs or heating grids, which are nothing more than an element similar to the type you see in electric heaters, but a bit heavier duty. A heating grid preheats air going into the internal combustion chamber, which heats up the engine to a suitable temperature for combustion. Otherwise, when cold fuel is sprayed into the chamber, it can gel and adhere to these parts. Hard starting and inefficient combustion occur with potential for damage to plugs and cylinder heads.

Many diesel engines come equipped with built-in, electric-powered block heaters to keep the engine block warm overnight. A diesel engine needs heat to ignite the fuel since there are no spark plugs, and this heat comes from the compression of air in the cylinders. When starting up in cooler temperatures, the heat from compression needs a little help—the grids provide this by heating the intake air.

Once the engine has been running a while, the heat from combustion warms the cylinders, and no additional heating is needed. However, those who live in colder climates will also need to install oil pan heaters. An oil pan heater makes it easier to start the engine and preheats the engine oil. When cold, oil becomes very thick and difficult to pump. Upon start-up while using an oil pan heater, warm oil is instantly pumped to the critical wear points in the engine. This protects engine components, extends battery life and reduces emissions, while contributing to operator comfort inside the cab by allowing the engine to get hot sooner.

The ideal coolant ratio is 50-50 coolant to water, but in cooler weather, it is suggested that you try using a 70-30 ratio instead. This will prevent the water from freezing. CBO

*Chad Parker joined Hyundai Construction Equipment Americas Inc. in 2018 as senior product specialist and sales trainer for wheel loaders and compaction rollers. Before joining Hyundai, Parker spent 15 years in the heavy equipment industry, with 11 of those years spent working for equipment manufacturers. Visit hceamericas.com.*

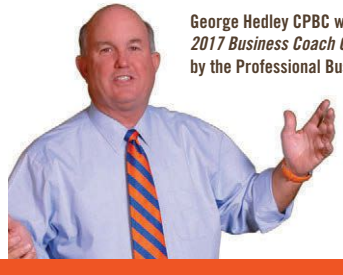



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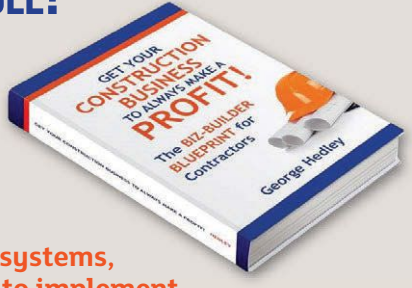
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# Oil Be There for You

## Increasing uptime with fluids designed for machines & their environments

BY BRITTA KOPP

Cutting corners when it comes to engine oil, hydraulic fluid or grease might save a few bucks on the front end, but it can have a detrimental effect on equipment long term. Tier 4 emissions requirements drive much of modern diesel engine oil requirements. Low-sulfur diesel fuel and aftertreatment systems call for engine oils compatible with these elements, and manufacturers develop their engines to work with an oil tailored to their machines' needs. Additionally, equipment relies on hydraulic fluids for motion, and, like engine oils, manufacturers develop fluids that optimize hydraulic system and hydrostatic drive performance.

Finally, grease is tailored to the machine's application based on aspects, such as shock loading, temperature, moisture and component serviceability. Selecting the right engine oil, hydraulic fluid and grease for a machine optimizes its operation and will allow it to achieve maximum service interval and overall service life.




### OIL CLASSIFICATIONS

The American Petroleum Institute (API) has developed a classification system that sets minimum specification requirements for engine oil. Oil categories for use in diesel engines begin with "C." CK-4 oils, which the API introduced in 2016, are formulated for high-speed diesel engines and are designed to meet 2017 and newer on-road and Tier 4 nonroad emissions requirements. CK-4 oil formulations work with modern low-sulfur diesel fuels up to 500 parts per million (ppm) and help protect against oil oxidation, oil aeration and viscosity loss due to shear.

CK-4 oils surpass the performance requirements of CJ-4, CI-4 and CH-4 oil classifications and can be safely used in engines calling for those oils. It is important to always use a high-grade oil that meets or exceeds the API classification of your engine.

### VISCOSITY MATCHING

When selecting an engine oil, ensure the viscosity rating, set by SAE International (initially established as the Society of Automotive Engineers) is suitable for the outside temperature of your jobsite. Your equipment's operation and maintenance manual should outline the recommended oil weights in various weather conditions. If you have misplaced your operation and maintenance (O&M) manual, contact your

dealer for another copy to reference in these and other maintenance situations.

Many machines roll off the production line with a 10W-30-weight oil, which offers the best performance in temperatures ranging from minus 20 degrees Fahrenheit to 90 degrees Fahrenheit. A 15W-40-weight oil performs well from minus 5 degrees Fahrenheit to 110 degrees Fahrenheit.

Synthetic or synthetic-blend oils contain additives that can lengthen the time between oil changes while also extending engine life. They also provide better cold weather starting and lubricating performance, as well as additional protection against wear when jobs demand operation at high speeds in high temperatures. For example, a 5W-40-weight synthetic oil can usually offer protection in extreme conditions as cold as minus 40 degrees Fahrenheit and as hot as 120 degrees Fahrenheit.

## HYDRAULIC & HYDROSTATIC OILS

The formulations of hydraulic and hydrostatic oils have been updated to meet the increased demand placed on hydraulic components. There are several types of these fluids on the market, each designed for a particular application:

- *High performance*—A custom blend of high-quality lubricants developed to provide peak flow at subzero temperatures while maintaining stability during periods of high temperatures
- *Synthetic*—Liquid technology designed to optimize cycle times and productivity, and provide good cold weather fluidity for seasonal changes
- *Biodegradable*—Liquid design that meets customer demand as federal, state and local governments set environmental-related project restrictions. It's biodegradable, nontoxic and formulated to reduce the potential for environmental damage.

## GREASE

Most compact equipment requires operators to grease and lubricate the pivot points where pins and bushings are located. Your machine's manufacturer should specify greasing intervals in the O&M manual, which may be online for quick reference. If applied correctly, grease can help extend the life of components and improve the efficiency of the machine. The National Lubricating Grease Institute classifies various types of grease, which should be matched to the machine's working conditions.

- *Multipurpose #2*—Developed for normal applications; provides lubrication to prevent rust and corrosion, and protection under heavy and shock loads
- *Heavy duty*—Contains molybdenum disulfide lubricant for better adherence to all surfaces; offers water resistance, extreme pressure capabilities, pumpability in cold temperatures and good seal compatibility
- *High performance/synthetic*—Formulated to provide high- and low-temperature performance in severe operating conditions; intended for lube points that slide and pivot
- *Chisel extreme pressure*—Formulated for use in extreme pressure applications where moisture and corrosion control are critical; is extra heavy duty; remains stable in water; and offers a balance between wear protection and corrosion resistance

## OIL ANALYSIS

With the increased demands on Tier 4 diesel engines, hydraulic and hydrostatic oil, compact equipment owners may want to consider additional preventive maintenance measures, including an oil-analysis program. This program includes a comprehensive evaluation of your machine's oils by an accredited laboratory, helping you more effectively monitor internal operating conditions.

### TOP 5 OIL ANALYSIS BENEFITS

**1.** *Identify contaminants*—Keep a close eye on oil conditions to identify wear-causing contamination that could negatively impact a machine's internal operating system.

**2.** *Ensure lubricant integrity*—Inspect lubricant properties to help determine if oils are performing properly.

**3.** *Identify minor problems before major failures*—Spot oil contaminants like dirt, wear particles, fuel dilution and coolants early to help prevent poor performance and catastrophic failure, as well as protect the life of your equipment.

**4.** *Maximize asset reliability*—Putting testing and analysis data to use can increase equipment uptime.

**5.** *Increase resale value*—Validate maintenance history documentation with analysis results, which may justify higher equipment resale values.

Regularly sampling and monitoring test data can highlight trends over time, helping you detect ferrous particles, wear, contaminants and fluid cleanliness.

Always consult your O&M manual for guidelines on preventive practices and remember that sampling oils can easily vary service schedules. Factors that can impact maintenance frequency requirements include how important a machine is to your operation, as well as environmental conditions, such as hot, dirty jobsites; brief trips with heavy loads; and excessive idle times. To get the most benefit from an oil analysis program, ensure samples are taken regularly. CBO

*Britta Kopp is the compact parts marketing manager at Bobcat Company, a Doosan Company. Visit bobcat.com.*



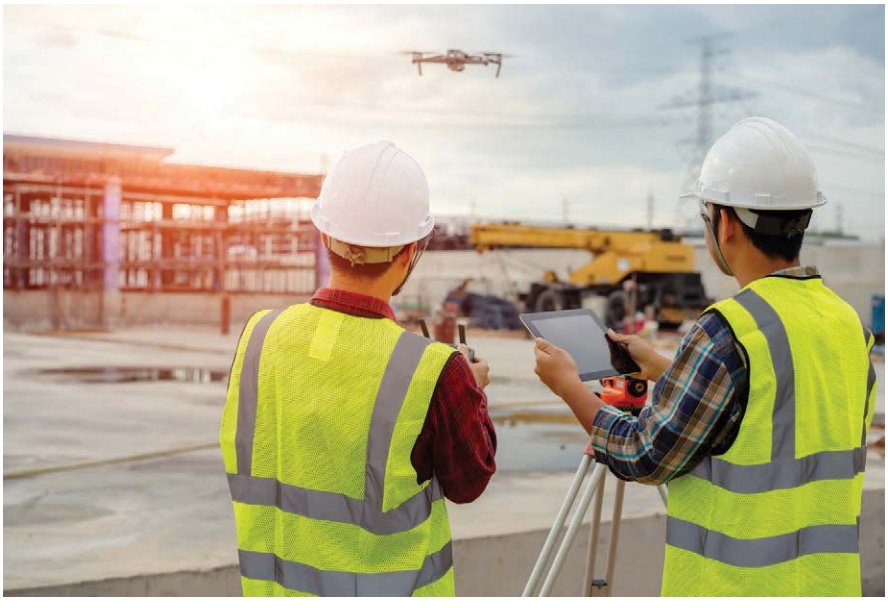
# 9 Ways Technology Is Lowering Risk on the Jobsite

## A look at the solutions reducing danger & driving safety forward

BY MATTHEW RAMAGE

As projects become even more manifold, the number of workers, equipment and materials that need to be tracked and managed increases. Under pressure to deliver work on time and within budget, safety can often become compromised. At the same time, the global worker shortage has made it difficult to adequately staff jobsites. A recent Dodge Data & Analytics study reported that four out of five contractors are at least moderately concerned about the safety risks created by workforce shortages. A combination of tight project timeframes and lack of skilled labor often leads to crews working longer hours or taking on additional work that might fall outside of their skill set, thus increasing the risk of incident.

As such, a growing number of construction companies are embracing technologies that can help make construction jobsites safer, more desirable places to work. A combination of hardware and software technology solutions are helping drive automation and data sharing across the jobsite. From smart sensors and drones to software that connects workers in the office and the field, technology is simplifying the daunting task of keeping workers safe, while also ensuring compliance and increasing security. The following are nine examples.



### 1 JOBSITE ACCESS

Ensuring workers are authorized for the construction area they're entering is critical for jobsite safety. Without proper access control, workers risk unintentionally entering a space that poses any number of health threats. Chemical exposure, hearing damage, head injuries or worse can occur when a worker enters an area without the correct safety equipment.

Using technology to manage access allows companies to more easily monitor who is entering and exiting the jobsite, and to not only secure access to workers who are authorized to be there, but to also customize entry to a jobsite based on criteria, such as signed nondisclosure agreements, passed drug tests, background screens and current licenses.

### 2 EMERGENCY RESPONSE

In the event of an emergency, labor management technology can broadcast text alerts with details about the check-in point and track which workers have reported to the rally site. These solutions also provide instant access to contact information and last-known location for each worker on-site, so headcounts are fast and accurate.

Bluetooth positioning and labor management technology can identify unresponsive or unconscious workers and provide relevant health and personal records, as well as emergency contact information, in seconds. On larger projects, general contractors are staffing full-time paramedics on-site for faster emergency response and using location tracking to quickly locate injured workers.

## 3 MACHINE CONTROL

Grade control technology is helping improve safety for site preparation and civil construction projects by drastically reducing the need for employees to work on the ground near heavy equipment on an active jobsite. With grade control on dozers, excavators, motor graders, pavers and other types of heavy equipment, the operator can verify that the machine is working to plan, without the need to pound stakes, move string lines and measure as they go. This also reduces the need to place workers in deep holes and trenches, on unstable hillsides, and in other dangerous situations on-site.

## 4 EXOSKELETONS

Exoskeletons, metal frameworks fitted with motorized muscles to multiply the wearer's strength, are also helping make the construction site a safer place. Also called an "exosuit," the robotic suit's metal framework somewhat mirrors the wearer's internal skeletal structure, making heavy objects feel much lighter, and sometimes even weightless. Worker overexertion costs United States employers around $15 billion annually in compensation, and many think that exoskeletons will make workers less prone to injuries from accidents or overwork.

## 5 SMART SENSORS

From temperature to noise levels and hazardous fumes, smart sensors are being used to monitor environmental conditions on the jobsite and prevent dangerous exposure to the elements. These sensors collect and analyze data to identify areas of a jobsite that pose a safety risk. In conjunction with labor management software, this information can be used to alert safety managers and others to dangers on a construction site in real time.

## 6 SAFETY TRACKING & REPORTING

Today's software solutions for construction management are more sophisticated than ever before and can help provide a better picture of a company's overall health and productivity. Real-time safety updates regarding weather conditions, heat indexes, road closures or anything else that might impact the health and welfare of workers, can be shared with workers in the field.

Cloud-based construction software has become the single point of truth for project data by seamlessly integrating the systems that track safety efforts, incident reports, safety checklists and feedback with a company's accounting, financial management and project operations. As such, contractors can keep closer tabs on safety incidents, trends and the overall impact of both on the company.

## 7 MIXED REALITY

Mixed-reality (MR) technology blends real-world objects with digital content interactively and in real time. Together with holographic technology, it brings 3D models off the screen and helps people efficiently interpret physical and digital information, as well as the spatial relations between them.

New, wearable, hard-hat-compatible devices enable workers in safety-controlled environments to access this holographic information on the worksite. MR is transforming the construction industry by improving the understanding and communication of complex spatial conditions through a truly immersive experience.

## 8 OFF-SITE PREFABRICATION

The ability to integrate information and share accurate data in real time has made off-site prefabrication more practical and cost effective. This approach allows workers to perform complex tasks off-site in a safe, controlled environment and reduces the amount of extra equipment and materials on the jobsite that can create safety hazards.

## 9 DRONES

Once a technology commonly associated with the military, drones have become widely recognizable across multiple industries, including construction. Although there are many ways drones are being used on construction sites today, they are especially useful when areas of a jobsite appear to pose a risk.

Drones can fly in and perform inspections, spending less time on the job than a crew member. Some include preprogrammed flight paths, which can be repeated weekly, daily or monthly, depending on the complexity of the project. This allows for the monitoring of dangerous sites remotely and on-demand, making way for preventive site maintenance and ensuring safety standards are maintained.

In addition to these new technologies, a constructible process that combines design, project management and engineering models into a collaboration- and data-rich platform, can lead to safer and smarter jobsites. In an efficient constructible process, all project phases and trades are connected and able to collaborate in real time. CBO

*Matthew Ramage is business area director for labor, equipment and materials at Trimble, a company leading a new approach to construction productivity growth through automation, IoT and data integration, as well simplifying health and safety and security practices on construction sites. Visit trimble.com.*



# Inside the Venture Capital Focus on Construction Technology

## What today's investors are following & why it matters to your business

BY RAYMOND LEVITT

There's a reason construction was reputedly slow to adopt digital technology compared to the aerospace, automobile and semiconductor industries. Mainframe computers were too costly and required too much overhead for all but the largest construction firms to deploy in their home or field offices. In addition, foremen and project engineers on the jobsite could not use desktop and laptop computers, so they stuck with paper-and-pencil processes.

However, this has changed dramatically in the last decade with powerful and easy-to-use mobile phones and tablets and with data networks available almost everywhere for sharing real-time data between field and home office systems. Construction's years of deliberate lag in adapting to digitization made the industry ripe for new tools to accomplish goals faster, more accurately and, of course, more economically, as well.

With more contractors embracing this movement, through adopting specific jobsite tools or construction tech ecosystems, such as Autodesk's BIM 360, and with construction making Investopedia's "Top 10 Fastest Growing Industries in the United States" list, the future looks bright for the industry. And that means it's also bright for investors and venture capitalists (VC).



### WHAT INVESTORS WANT

VC firms employ different strategies and focuses for a variety of their investment decisions. Banking on technology, some VCs employ a strategy that focuses on early-stage companies redefining efficiency in three areas of construction: the built environment (design, construction facility operation, management), transportation/logistics and renewable energy/grid management.

According to TechCrunch, investments in these areas have become increasingly popular. The site reported that, in 2018, funding in construction startups jumped 324% over the previous year, resulting in $3.1 billion in overall investments.

The construction industry can be viciously cyclical, but many industry investors are looking beyond short-term goals to invest in the future of the space. Many VCs don't focus their investments on specific projects but, rather, on the companies that help engineering, construction and real estate firms achieve dramatic improvements in the life-cycle cost, schedule, safety and sustainability of their projects. These investors seek to

create "triple bottom line" sustainability in terms of economic, environmental and social sustainability goals and metrics that can be broken down into three categories.

1. *Economic*—Startups like Pype and Rhumbix represent a convergence of hardware, software and business model trends to save even midsize construction firms millions of dollars annually by eliminating the information disconnect and delay between the office and the field.
2. *Environmental*—Startups like Ultra High Materials LLC are developing next-generation materials and innovative manufacturing processes for construction that create far less wastage of natural resources. These companies are producing almost zero carbon dioxide (CO2) emissions in their manufacture, assembly and operation, compared with traditional materials and processes like cast-in-place or precast concrete, as well as the manufacturing, fabrication and erection of structural steel.
3. *Social*—Startups like Safesite Solutions Inc. use emerging information technologies to detect and correct safety hazards. Jobsites, by nature, can be dangerous places. Moving data from the field to the office in real time allows management to oversee, monitor, compare and access information that keeps workers and businesses better protected.

## GREENER BUILDING PROCESSES

Perhaps what holds the most promise is the way builders and contractors are looking to the future with regard to their materials and building processes. Leadership in Energy and Environmental Design (LEED)-certified building has gone from an anomaly to a trend too big to ignore. In 2006, 296 LEED certifications were awarded. In 2017, that number was over 65,000. LEED is quickly becoming a preferred metric for evaluating buildings, due in no small part to its life cycle financial payback. The life cycle operation, maintenance and renovation of buildings typically accounts for eight to 10 times the cost of their initial construction.

Contractors who develop a reputation for sustainable building through greener practices—such as delivering buildings with measurably lower life cycle costs due to higher energy efficiency, enhanced durability, resilience to natural hazards and a lower volatile organic compound release—are becoming the favored builders for many building owners and operators. These owners and operators are often looking for a sustainable future that includes carbon taxes, or carbon cap-and-trade regimes. Moreover, they're considering their own reputations in order to attract and retain a workforce and set of customers who are increasingly more environmentally concerned.

## GREENER BUILDING MATERIALS

Climate change is motivating both mitigation and adaptation, which is clearly playing out in the construction industry. One material that highlights the upcoming shift in building processes is concrete.

Cement is arguably the most environmentally unfriendly material on earth. Its manufacture typically uses fossil fuels to heat kilns that drive CO2 out of limestone, creating double the negative impact on emissions. Cement's manufacture, transportation and installation account for about 7% of all greenhouse gas emissions globally. Finding replacements for ordinary Portland cement that can match or exceed its properties as a binder for concrete, as well as its cost, has been a key objective for environmentalists.

Novel cements are proving to be just as effective in concrete as a building material, but they have not yet been cost competitive with cement, so they have not seen widespread adoption. But that is changing as companies like Ultra High Materials are inventing new chemical compounds that can bind sand and aggregate into concrete with faster set times, higher early strength and better durability than Portland cement—all at a comparable cost.

As of now, there are only a handful of big producers of alternatives to cement. With a lack of competition comes slower integration, but this slowness is mainly due to reluctance from owners, architects, engineers, building code officials and contractors to adopt new materials that have yet to withstand the test of time.

Caution has to be part of the equation, as the stakes are so high. However, reluctance can also trigger stagnation. Many business owners were reluctant to adopt time and management (T&M) tracking. But the evidence became clear that digital T&M tracking was saving big money by cutting down on misplaced tags and time-wasting preparation.

VCs routinely bet on the future. And, right now, they're betting on the construction industry—an industry that is not only showing its ability to adapt, but also to embrace new technologies that will allow building to take place faster, safer, more effectively and less expensively.Healthy skepticism can be valuable because it forces you to look carefully at all the potential costs and benefits of new technologies. And when you do, you'll see that stagnation is something to avoid, and the future of construction is now. **CBO**

*Raymond Levitt, Ph.D., is an operating partner with the VC firm Blackhorn Ventures, focusing on the built environment. A Kumagai Professor of Engineering Emeritus at Stanford University, Levitt founded and directs Stanford's Global Projects Center and served as a commissioner of California's Public Infrastructure Advisory Commission to channel private investment and expertise into California's aging transportation infrastructure. Visit blackhornvc.com.*



# 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.




**DOOSAN INFRACORE NORTH AMERICA LLC**
DX170LC-5 Crawler Excavator
**Released: 8/1/19**
**Availability: U.S. & Canadian markets**
**What's new?** Excavator that falls below the 80,000 gross vehicle weight-rating limit for simplified and less expensive transportation
**Specs:** Features 127 horsepower; 38,376-pound operating weight; 25,794-pound-force bucket breakout; 18,078-pound-force arm breakout; 19 feet, 11-inch maximum digging depth; 28 feet, 10-inch maximum digging reach; 8-feet minimum loading height; 8 feet, 5-inch width
Check 207 on index.



**THIRDEYE GEN ▶**
X2 Mixed-Reality (MR) Glasses
**Released: 7/1/19**
**Availability: U.S. market**
**What's new?** The smallest MR smart glasses with hardhat capabilities for field workers
**Specs:** Weighs 6 ounces; has built-in, proprietary simultaneous location and mapping (SLAM) system that allows for 3D environment scanning and advanced MR features (live, remote augmented-reality support and display of virtual instructions on a machine)
Check 208 on index.



**◀ TRUELOOK**
Mobile Camera Trailer
**Released: 8/9/19**
**Availability: U.S. market**
**What's new?** A lightweight trailer that can be maneuvered around large jobsites and sites with limited visibility or challenging terrain
**Specs:** Features an 18-foot telescoping mast, battery backup, built-in 4G LTE cellular modem; equipped with high-definition, 1080-pixel pan-tilt-zoom (PTZ) camera with 360-degree rotation, 30x magnification optical zoom, built-in infrared; ships directly to the jobsite, activated and ready to use
Check 209 on index.

## HYDROTEX

### Ruby-Tac 220 Multipurpose Grease

**Released:** 7/16/19
**Availability:** U.S. market
**What's new?** Designed for both on- and off-site applications, simplifying maintenance for construction site technicians
**Specs:** National Association of Lubricating Grease Manufacturers (NLGI) chassis and wheel bearing (GC-LB) highest performance certified; available in NLGI grades 2 and 1, International Standard Organization (ISO) 220 base oil viscosity; extreme pressure (EP) rated; suitable for relubrication
Check 210 on index.






## THE TORO COMPANY

### TRX Walk-Behind Trenchers

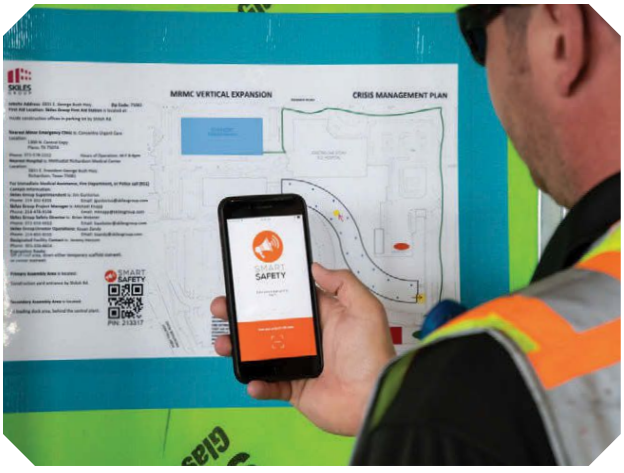
**Released:** 7/30/19
**Availability:** U.S. & Canadian markets
**What's new?** Intelli-Trench technology that optimizes the machine's hydraulic flow for the digging conditions
**Specs:** TRX-250 is equipped with a 24.5 horsepower Toro engine and a maximum forward speed of 2.4 mph (3.9 kilometers per hour); TRX-300 has a 26.5 horsepower Kohler electronic fuel-injection engine and a maximum forward speed of 2.3 mph (3.7 kilometers per hour)
Check 211 on index.




## TEREX UTILITIES

### Load Alert Monitor Display

**Released:** 8/12/19
**Availability:** All global markets
**What's new?** Technology that monitors and analyzes the truck's jib and platform capacity and boom positions on Terex aerial devices, and provides visible and audible alerts when an overload is detected, showing all on-screen
**Specs:** Monitors boom angle, platform and jib capacity, winch line distance from the platform pivot point, and winch line load; includes a full load chart in addition to the printed load chart, to assist operators with staying within the operating limits of the aerial device; indicates that the system is operational and turns red if an overload is detected during operation; shows the percentage of overload for the platform and jib or both; alerts with sound
Check 212 on index.



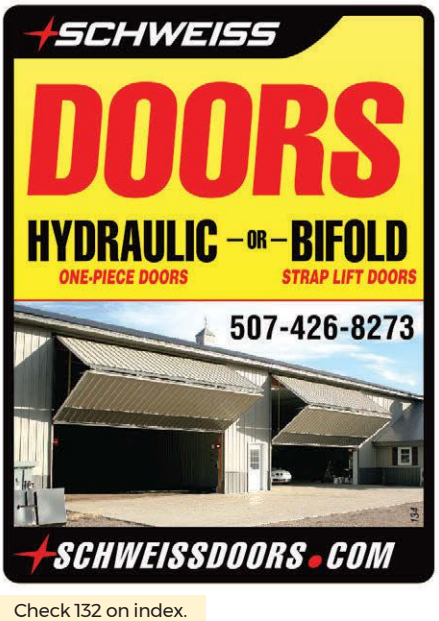

### ▲ SMART SAFETY
Smart Safety App
**Released:** 5/28/19
**Availability:** U.S. market
**What's new?** An app that instantly delivers custom notifications and critical safety information to the smartphones of on-site project teams during emergency situations
**Specs:** Available on iOS and Android; uses geolocation/geofencing technology to define project perimeters and deliver emergency action information directly to smartphones; requires only that workers download the app and "check in" to the project with a quick-response (QR) code or pin once on-site
Check 213 on index.




### ▲ RIDGE TOOL COMPANY
Rigid NXT Wet/Dry Vacs
**Released:** 8/12/19
**Availability:** U.S. & Canadian markets
**What's new?** An ergonomic makeover, resulting in enhanced features for easier cleanup
**Specs:** Includes a front-to-back top carry handle for more comfortable grab-and-go maneuverability, and new drum key and side latches that create a tighter lid-to-drum seal to securely keep dirt, dust and debris inside the vac
Check 214 on index.




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# CONSTRUCTION BUSINESS OWNER

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**1. Your company's primary business is:**
*(Check Only One)*
- ❑ 12 General Contractor – Commercial
- ❑ 02 General Contractor – Residential
- ❑ 10 Construction – Special Trade Contractors
- ❑ 03 Highway and Street Construction
- ❑ 04 Water, Sewer and Utility Construction
- ❑ 05 Heavy Construction
- ❑ 06 Concrete Work
- ❑ 07 Excavation Work
- ❑ 08 Wrecking and Demolition Work
- ❑ 13 Architecture, Engineering and Construction Management Services
- ❑ 11 Consulting Contractor
- ❑ 99 Other (please specify)

_____

**2. Your primary job title is:** *(Check Only One)*
- ❑ 10 Owner, Partner, President, CEO, CFO, COO, Vice President, Director
- ❑ 11 General Manager, Manager, Foreman, Superintendent, Purchasing Agent, Controller, Accountant
- ❑ 12 Engineer, Architect
- ❑ 06 Consultant
- ❑ 99 Other (please specify)

_____

**3. Approximate annual contract sales volume:**
*(Check Only One)*
- ❑ 01 Less than $500,000
- ❑ 02 $500,001 – $1,000,000
- ❑ 03 $1,000,001 – $2,500,000
- ❑ 04 $2,500,001 – $5,000,000
- ❑ 05 $5,000,001 – $10,000,000
- ❑ 06 $10,000,001 – $20,000,000
- ❑ 07 $20,000,001 – $50,000,000
- ❑ 08 More than $50,000,000

**4. Which of the following products/services are you planning to buy during the next 12 months?**
*(Check All That Apply)*
- ❑ 01 Earthmoving Equipment
- ❑ 02 Trucks, Trailers and Accessories
- ❑ 03 Compact Equipment
- ❑ 04 Lifting and Hoisting Equipment
- ❑ 05 Safety Equipment and Apparel
- ❑ 06 Attachments
- ❑ 07 Concrete and Paving Equipment
- ❑ 08 Survey and Site Prep
- ❑ 09 Compressors, Generators and Pumps
- ❑ 10 Financing and Accounting Services
- ❑ 11 Software and Technology
- ❑ 12 Insurance and Bonding
- ❑ 13 Training and Education
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## Annual Value of Construction Put in Place

### July 2017/2018/2019 Annual Rate Comparison

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

| | 2017* | 2018** | July 19 |
|---|---|---|---|
| **Total Private Construction** | **961,635** | **1,011,567** | **963,139** |
| Residential | 524,880 | 542,307 | 506,743 |
| Nonresidential | 436,756 | 469,260 | 456,396 |
| **Total Public Construction** | **281,171** | **313,236** | **325,655** |
| Residential | 6,465 | 6,868 | 6,035 |
| Nonresidential | 274,706 | 306,368 | 319,621 |
| **TOTAL Construction** | **1,242,806** | **1,324,803** | **1,288,794** |

**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.*

**$1,288,794**

JULY 2019 TOTAL ANNUAL VALUE OF CONSTRUCTION PUT IN PLACE

"The data is not the same as what we saw leading up to the last economic downturn, but the continued, slowing across the board will undoubtedly impact architecture firms & the broader construction industry in the coming months," said AIA Chief Economist Kermit Baker, Ph.D., Hon. AIA. "A growing number of architecture firms are reporting the ongoing volatility in the trade situation, the stock market & interest rates are causing some of their clients to proceed more cautiously on current projects."

## AIA Architectural Billings Index (ABI)

| National | | | *Regional - Billings | | | | *Sectors - Billings | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Month | Billings | Inquiries | Northeast | Midwest | South | West | Multifamily Residential | Commercial/ Industrial | Institutional | Mixed |
| 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 |
| Apr-19 | 50.5 | 60.9 | 45.1 | 49.3 | 51.6 | 49.0 | 47.4 | 46.6 | 49.2 | 53.2 |
| May-19 | 50.2 | 56.2 | 47.5 | 51.6 | 51.4 | 50.0 | 46.0 | 53.0 | 48.0 | 55.4 |
| Jun-19 | 49.1 | 52.8 | 46.1 | 48.9 | 51.0 | 49.3 | 46.3 | 52.3 | 47.0 | 54.3 |
| Jul-19 | 50.1 | 54.9 | 48.3 | 48.9 | 48.3 | 51.2 | 50.6 | 49.2 | 49.8 | 48.9 |

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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By bringing your finance, HR, project management and mobile field tools together with one common set of data, you can encourage technology adoption and real-time information sharing across project teams. The result is an integrated and flexible system for managing operations, improving productivity and enabling better decision making by getting all your teams on the same page.

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- The importance of eliminating manual processes and having one set of trusted data for all your teams
- How dashboards and data visualization can simplify communication and decision-making
- The common pitfalls of trying to cobble together apps and other software packages from a bunch of different providers
- How integrated processes that utilize modern cloud-based technologies can lead to improved productivity and profitability

**SPEAKERS**



**Scott Rosenbloom,** *Vice President, Analytics*
Viewpoint

Scott Rosenbloom leads Viewpoint's Analytics group, driving big data, machine learning and artificial intelligence initiatives across all of Viewpoint's products. Rosenbloom spent the last 5 years at Dexter + Chaney and Viewpoint helping contractors get their teams working in one common set of data to enable better decision-making and better business outcomes. Prior to going to work in construction software, he spent 8 years working in product and sales roles in Microsoft's Server & Cloud division.



**Mark Schwartz,** *Senior Product Manager*
Spectrum by Viewpoint

Mark Schwartz is responsible for product life cycle, strategic planning and successful release of new operations functionality in Viewpoint's Spectrum construction software. He has over 15 years of experience in construction software sales and product management, both at Dexter + Chaney and Viewpoint.

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