







POWERON.





ccording to a Small Business Trends report, only 36.4% of construction businesses reach their fifth year of business. How is that possible? Simple—a lack of business tools and continuing education can stunt the success of even the most talented contractors in the trades. Without fundamental business skills, your company is at risk of joining that statistic.

On May 23 at 2 p.m. EDT, we're hosting a webinar to sharpen those skills and keep your finances on track. "Financial Reports Every Contractor Needs to Run their Business" will cover how to run mission-critical financial reports, the data you need to capture to create them and tips for best-in-class reporting tools to make the job easier. Having the right data available at the right time, and the ability to analyze that information, can improve profitability, reduce risk and help you take action faster when your financials get off track. Registration is free at construction businessowner.com/webinars.

Turn to page 28 for Real Jobsite Solutions, a special section chock full of tools and services to help solve your project challenges. This section is designed to introduce contractors to some of the industry's most effective solutions, inform decision-makers of new opportunities and share successes. The stories in these pages explore the real-life successes of business owners just like you, as well as the tech, tools and equipment they're employing on-site.

Our cover series this month focuses on safety and features a pro on the topic, Henry Nutt III. Nutt is a sheet metal general superintendent at Southland Industries and an industry leader on the subjects of safety and lean construction. In "The Top 3 Safety Factors Affecting Teams Today" on page 20, Nutt partners with Dodge Data & Analytics to review several ways for contractors to better address safety, both on their projects and within their companies.

Next in the series, on page 24, "Why Safety Technology Is at Risk of Defeating its Purpose & How Operators Can Help" offers a comparison of smart equipment and smart operators, providing answers to the question, "Who's really in charge on the jobsite?"

Staying on the tech train, "Using AI & Computer Vision to Eliminate Inefficiencies & Improve Safety" on page 26, reviews solutions, such as management software, robotics, internet of things (IoT)/wireless sensors, artificial intelligence (AI) and more that are being developed and deployed to help rid construction businesses of the productivity deficit and improve safety.

Are you a safety expert? Or an expert in your respective field of knowledge? If so, we'd like to talk. We're forming a Reader Advisory Board to complement our Editorial Advisory Board (listed to the right). We're looking for readers who know the industry inside and out and want to share their expertise with us and others who are looking to learn more about business. Email me at kwells@cahabamedia.com for more information.

Take good care,



One method for alleviating the labor shortage? For John Deere, it's creating equipment that is easier to operate. In March, Managing Editor Elizabeth Manning traveled to Sacaton, Arizona, to visit the John Deere Proving Grounds and try out some of the equipment manufacturer's newest offerings. Manning is pictured here with the new 460E Articulated Dump Truck.











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Secrets of Successful Hiring for Today's Workforce Kathy Cole

Gender Diversity Is Good for the Construction Industry Peggy Newquist

HUMAN RESOURCES

(8 CPE credits available)

& OPERATIONS



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► Armstrong World Industries Inc. Acquires ACGI

Armstrong World Industries Inc. (AWI) has completed its acquisition of Architectural Components Group Inc. (ACGI). ACGI marks AWI's third acquisition in the last 12 months. ACGI is a designer and manufacturer of custom architectural specialty wood ceiling and wall solutions, located in Marshfield, Missouri. ACGI capabilities and product solutions will complement and enhance AWI's existing wood ceiling and wall solutions and strengthen AWI's market position in the category. AWI will service all of its wood products out of the acquired Missouri facility and through existing distribution channels. AWI funded the acquisition with available cash. Financial terms of the transaction were not disclosed. Visit armstrongceilings.com

► CPWR Receives Henry C. Turner Prize for Innovation in Construction

Turner Construction Company and the National Building Museum have announced that CPWR - the Center for Construction Research and Training and, in particular, Dr. Linda M. Goldenhar, will receive the 2019 Henry C. Turner Prize for Innovation in Construction (with a \$25,000 honorarium) for their efforts to promote and improve safety conditions for construction workers. Since 1990, CPWR, a nonprofit organization, has provided safety and health resources to the construction industry, which has had a positive impact on reducing occupational injuries, illnesses and fatalities. CPWR leads the National Construction Center for the National Institute for Occupational Safety and Health and supports a diverse consortium of researchers and experts at universities, government agencies, unions and corporations. The consortium members work

closely with CPWR to identify the most pressing construction safety and health hazards, apply research methods to solve complex problems, and put solutions into practice to protect workers. As CPWR's director of evaluation and research, Goldenhar has been leading research projects while working with construction industry stakeholders to create practical tools for solving these issues. Visit turnerconstruction.com.

America (SEAA)/National Center for Construction Education and Research (NCCER) Ironworker Training Units and Assessment Sites. They are: ASPE-South LLC of North Carolina, Trivent Safety Consultants of Colorado, and Monterey Structural Steel Inc. of California. ASPE-South, a division of American Steel Precast Erectors, will offer ironworker training and assessments. Trivent Safety Consultants offers Occupational

than 50 certified craftsmen in Ohio and Georgia. Many of the architectural landmarks are award-winning restoration projects and have included cathedrals, courthouses, military sites, churches and buildings listed on the National Register of Historical Places. Several projects have been awarded the Distinctions of Excellence and Merit from the Associated Builders and Contractors Inc. MMI attributes its successes to



In April, Case Construction Equipment celebrated 50 years of manufacturing with a ceremony at its Wichita, Kansas, plant. Case first built skid steers in 1969 at its Burlington, lowa, facility before eventually moving production to Kansas. Case skid steers and compact track loaders (CTL) are made "for the world" in Wichita, meaning that every Case skid steer or CTL sold and operated anywhere in the world today comes from Wichita. Visit casece.com.

► Rosendin Names Interim President of NECA



Larry Beltramo President and chief operating officer (COO) of electrical contractor Rosendin, Larry Beltramo, has been named the interim president of the

National Electrical Contractors Association (NECA). Beltramo will remain president and COO of Rosendin while serving as the interim president of NECA. The move follows the resignation of current NECA President, David Long, as he accepts a new role to serve as CEO of the organization. Beltramo has served as a vice president at large of NECA since January 2018. He was chosen by the executive committee to serve as interim president until a new president is elected at NECA's board of governors meeting this September in Las Vegas, Nevada, Visit rosendin.com

▶ 3 Companies Join SEAA/ NCCER Ironworker Training Units & Assessment Sites

Three additional companies have joined the nationwide network of Steel Erectors Association of

Safety and Health Administration (OSHA) compliance expertise to help companies develop, implement and maintain safety and health programs. Featuring instructor led on-site training, the company will offer mobile crane operator certifications in addition to SEAA's United States Department of Labor-approved ironworker apprenticeship program and assessments. Monterey Structural Steel Inc., a fabricator of structural steel, miscellaneous metals, stairs and ornamental iron, will utilize the ironworker training and assessment program. Visit seaa.net.

► Midwest Maintenance Inc. Celebrates 40th Anniversary

Midwest Maintenance Inc.'s (MMI) founder, William R. Meyer, and current President, William J. Meyer, along with the company's employees, are celebrating its 40th anniversary in the architectural preservation and historic restoration industry. The Ohio-based company, built on its mission of "providing customers with exceptional workmanship and extraordinary service," has actively restored and managed hundreds of landmark projects in 14 states and employs more

its employees who are certified in their respective trades and also committed to preserving America's architectural heritage. Visit midwestmaintenance.com.

► ProPulse Joins John Deere Supply Base

ProPulse has been chosen to supply to John Deere's operations at multiple sites. ProPulse is a supplier of highpressure hose assemblies based in Peosta, Iowa (Dubuque County), manufacturing and assembling thermoplastic and wire-braided rubber hydraulichose assemblies. Founded in 1998, ProPulse specializes in supplying original equipment manufacturer (OEM) production lines for companies that manufacture machinery and equipment in the construction, forestry, agriculture, cleaning and transportation fields. Visit powermovingforward.com

Swinerton Announces New Mass Timber Business Group

Swinerton has launched Swinerton Mass Timber, a business unit that will pursue new projects that are being developed with mass timber, and the team will evaluate other project opportunities to determine mass timber solutions. Swinerton Mass Timber experts will shape the paths for delivering financially viable mass timber structures, working with project teams and key partners across the nation to develop, design and deliver mass timber buildings. Swinerton Mass Timber is led by a team that includes Chris Evans, Erica Spiritos, William Siva, Zach Brehm and Graham Montgomery, and is located in Portland, Oregon, with a second office in Greenville, South Carolina. "Our goal is not only to deliver mass timber projects across every market in the U.S., but to also support both the development and design communities in learning more about cost-effective applications of mass timber in the built environment." said Evans. Visit swinertonmasstimber.com.

► AEM Elects Directors to AG & CE Sector Boards



Johannes Schulze Vohren



Jeremy Yoder

The Association of Equipment Manufacturers (AEM) has elected Johannes Schulze Vohren, regional president, North America for Wacker Neuson, to the AEM CE Sector Board and Jeremy Yoder, executive vice president (VP) and COO of DISTek Integration Inc., to

the AEM AG sector board to fill unexpired terms. AEM officers and directors come from an industry cross section and work cooperatively on behalf of the entire membership. They provide strategic direction and guidance for association initiatives that help members and the industry succeed in an ever-changing business environment. Key action areas include advocacy and public affairs, market information, exhibitions and events, as well as safety,

regulatory and technical issues. Johannes joined Wacker Neuson in 1994 and has held a variety of management positions, including sales and product support for the U.S. international markets, business systems, information technology and logistics. He has also worked in consulting and in international sales at Case IH and Tenneco Automotive. Jeremy joined DISTek in 1998, serving many roles, including VP of engineering before becoming executive VP and COO. He has more than 20 years of experience developing software solutions for the agriculture- and construction-equipment industries. Visit aem.org.

► NSI Industries LLC Merges with Platinum Tools

NSI Industries LLC, provider of electrical and control products, is merging with the Newbury Park, California-based Platinum Tools, expanding its product portfolio and creating new value for a wide range of customers. Platinum Tools supplies Datacom Group products, driving the innovation for the preparation, installation, hand termination and testing of wire and cable. Platinum Tools' portfolio includes cable management solutions, structured wiring products, tester kits, cutters, crimpers and other products for electrical, industrial, security, audio/video, commercial, residential, datacom and telecom applications. Visit nsiindustries.com and platinumtools.com.

► TriBuild Inc. Acquires Radar Construction Software

TriBuild Inc., provider of software-as-a-service (SaaS) solutions for the construction industry, has acquired Radar Construction Software (Radar), provider of cloud-based construction management software. Radar's integrated project management applications enable trade contractors to work more efficiently, facilitating key functions, including

preparing bids, requests for information and change order submissions, as well as handling contract management, equipment tracking, scheduling and deadline monitoring. Natalie Abshier, product director at TriBuild Inc. said. "Radar's software has evolved significantly since our first project management system, ConstructJob, as we combined the latest advancements in technology with our many years of experience in the specialty contractor trades. I am excited to fulfill my vision for a comprehensive construction project management solution in cooperation with the TriBuild team." Visit tribuildinc.com.

► Soprema VP Selected as ARMA President



Tim Kersey

The Asphalt Roofing Manufacturers Association (ARMA) has announced the election of Tim

Kersey, VP and general manager for Soprema Inc., as the association's president for the 2019 term. ARMA represents North American asphalt roofing manufacturers, as well as raw material suppliers, and serves to promote the long-term sustainability of the asphalt roofing industry. Kersey has served multiple terms as the chairman of ARMA's low-slope roofing committee, a role in which he crafted technical publications and codes standards and supported activities for low-slope asphalt roofing applications. He joined the ARMA board of directors when he joined the Soprema executive team in 2012, and he has served on the board ever since. Due to his experience with the organization, Kersey was elected by his peers to the executive committee, ARMA's governing body, and served as the treasurer/secretary for 2 years. His term as president began Jan. 1, 2019. The ARMA

president is responsible for facilitating the board of directors' activities and setting the agenda for the organization. In 2019, Kersey plans to continue the organization's momentum in driving awareness of the benefits of asphalt roofing in the residential space, while also bolstering communications around the advantages of asphalt roofing in the low-slope/commercial market. Visit asphaltroofing.org.

► HNTB Corporation Hires Houston Project Director



Robert Kennah

Robert Kennah, PE, has joined HNTB Corporation as project director in the firm's Houston, Texas, office. Kennah has more than 23 years

of engineering and project management experience and has served in leadership roles on high-profile transit projects throughout the nation. Kennah is responsible for managing and delivering major projects, nurturing client relationships and working to expand HNTB's services to its regional transit clients. Throughout his career, he has worked on transit projects across the U.S., including light rail, automated people movers, and terminal and station modeling. Kennah holds a bachelor's degree in civil engineering from the University of Wyoming. HNTB's signature work can be seen on transit projects in Texas and nationwide, including Houston Metro's Northwest Transit Center, the Dallas Area Rapid Transit Blue Line Light Rail extension to serve South Oak Cliff, the Charlotte Area Transit System's Blue Line Extension, the Atlanta streetcar system, the Wilson Station Reconstruction project in Chicago, and many others. Visit hntb.com.



What about your business keeps you awake at night? Our industry experts share their solutions to some of the biggest problems facing construction business owners & their teams.

What effects are wearables having on the safety of jobsite teams?



RYNE DEBOER
Vice President
The Morey Corporation

Wearables on the jobsite have drastically improved worker safety, and the most prominent example I've seen is through sensors. **Continuous** advancements in sensor development have made these devices smaller than ever—something a worker can easily clip to their belt, hardhat, shoes or anywhere else.

With these sensors, construction site managers can be alerted in real time if a worker slips or falls, and even track worker fatigue, to make sure employees don't overwork themselves to the point of exhaustion.

The sensors can also help prevent injuries. For example, managers can set up geofencing to automatically alert workers when they're entering dangerous areas.

As sensor technology in wearables becomes even further advanced, **we can expect to see even more use-cases for how wearables are helping** to keep construction managers and employees safe.



DAVE GALBRAITHAssistant Vice President,
Risk Management
Amerisure

Organizations that deploy wearables provide a unique opportunity to improve safety culture. **Wearables provide instantaneous feedback about risky behavior,** which means in-the-moment training becomes an expected part of the job.

Managers can correct these risky behaviors on the spot, improving the overall safety climate on the jobsite. **When safety climate is improved, losses drop**. These losses may be attributed to worker injury and the resulting workers' compensation, as well as the loss of time through project delays. And fewer losses means the bottom line for businesses improves or, at the very least, is protected.

However, **the effects of wearable use extend far beyond the jobsite**—the safety
climate improves; employee commitment to safety
improves; and businesses have the opportunity to
grow profitably and take on new work without the
challenges of loss.



North America's Largest Utility & Construction Trade Show

1,000+ Leading Manufacturers & Service Providers
More than 28 Acres of New Products
18,000+ Construction & Utility Professionals

Utility professionals worldwide use ICUEE to make informed purchasing decisions that position their businesses & teams for success.



When Bad Players Bring Down the Team

How to cut your losses & free the cultural misfits



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

Ask George

To submit a question for George Hedley, email Editor Kathy Wells at kwells@cahabamedia.com. illing positions with the right people is a constant struggle. The wrong people disrupt and impede productive workflows, cause problems, complain, make excuses, disrespect others, repeat mistakes, resist personal growth, don't follow rules, and can't communicate well with employees or customers. These hires slow down the success of your company. It's important that owners recognize employees who behave this way and swiftly rid the company of them at all possible costs.

HIRING, TRAINING & FIRING

The first step to building a winning team is to hire the players who have upstanding character and a good attitude. These are usually the best people in your market—people who are dedicated to performing, improving and exceeding expectations. The best hires are also accountable and responsible, make good decisions, find solutions, take action, uphold integrity, are committed to professional excellence, and are respectful of others.

The next step is your commitment to training and mentoring employees, equipping them to become the best. This requires an investment of your time, mentoring the employees with the highest potential to make a difference in your company's future. Most contractors don't have a formal training program or career development ladder. In fact, many contractors do not conduct any training

with employees, instead hoping workers improve through learning on the job. This lack of training keeps companies stuck, with below-average results, and constantly on the hunt to find trained help.

To build a strong team filled with the right players, you cannot accept poor performance. You must be resolute in your decisions and willing to fire repeat offenders. When employees don't operate within the company's core values, they must go. Don't waste time and money keeping the wrong people. Remember: One bad apple rots the entire bushel.

In the "mastermind" peer group meetings I host for construction business owners, we discuss the "train or fire" test—a method in which you ask yourself, "Do I love them or like them?" when deciding whether to keep a certain employee. Almost unanimously, attendees are in agreement that it's best to only retain the employees you love. Keeping problem employees discredits your reputation as a leader. If you are unwilling to make tough decisions—like firing poor-performing players—your existing employees will lose respect for you, and their quality of work will reflect that.

FOCUSING ON YOUR BEST

The right way to build a team is to focus on your A-players, train and mentor your B-players to become A-players, and eliminate your C-players as quickly as possible. C-players are employees who

The right way to build a team is to focus on your A-players, train & mentor your B-players to become A-players, & eliminate your C-players as quickly as possible.



shouldn't work for your company. They don't fit in-like a round peg trying to fit into a square hole. They aren't happy, and as their employer, you're not happy with their abilities, attitude or performance.

The best thing you can do for poor performers is to free them from your company and let them move on to where they can thrive.

Golfers who pad their handicaps are often called "sandbaggers." They keep their handicap artificially higher than it should be, so they get a few extra strokes from their opponents during match-play competition. The term "sandbagger" comes from the concept of filling a player's golf bag with sand so it's heavier than normal, causing them to get tired, not play up to their potential and maintain a padded, higher handicap. Thus, sandbaggers are able to win games by cheating the system, rather than playing up to their true ability.

When you tolerate poor players or postpone firing them, you act as your own sandbagger. Who on your crew or staff is a slacker? Who causes you grief? Who constantly produces sub-par work? Who has a bad attitude? These poor performers are operating right under your nose, infiltrating your teams and bringing every person on them down.

CUTTING THE C-PLAYERS

When employees stop growing or run out of momentum, they become dead weight, slowing down your company's growth and becoming a hazard to others. When you don't cut ties with dead-weight employees, other employees are forced to endure them, find ways to work around them, cover for their mistakes and make excuses for them.

As a business owner, you're inherently busy. And you might feel like your busy schedule prevents you from having time to commit to the task of eliminating C-players and finding better employees to fill their positions. But, by doing nothing and tolerating these poor performers, you're losing more money than you think. One bad employee can reduce your crew's efficiency by as much as 25%.

To put yourself back on the right path, make a list of your employees and rate them based on proficiency in the skills crucial for their respective duties. Rate their attitude, character, teamwork and

aptitude, as well as their desire to take on more responsibility and leadership. Through this process, you will solidify the list of employees with whom you want to build your business and those you need to let go.

It's likely that as many as 10% to 20% of your employees are ill-suited for their position, but it's not all your fault. Not everyone you hired was the right player, and you shouldn't feel bad about it. You made the best hiring decision you could make at the time. And time often proves that some people meet the job requirements but are just not a cultural fit within your company values.

Right now, you know some of your employees are a bad fit, but they're still there—a situation that's equally as bad for their careers as it is for your company. They need to move on to a place where they'll contribute in a positive way, and you need to help them do that.

You should feel good about cleaning out the C-players. It's the best move for all parties involved. So, toughen up and make the hard decisions. Then, make it your priority to find the right players who can make your company a better place. CBO

Maybe You're Doing it Wrong

4 moves toward a project-planning method that does more than check boxes



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

ost organizations are busy.
Even in the deepest
recessionary market, rarely are
construction firms sitting idle. Often, the
feeling of elation on a successful bid/
award day is quickly replaced with anxiety
about how the project will be completed
within budget.

Whether the time from award to mobilization is 2 days or 2 months, the ability to position an operational team for success should be of utmost priority. However, many organizations absentmindedly rush their way through the preconstruction process. Planning at this stage should be less about setting the world speed record for project strategy and more about devolving a plan for operating as a foundation of excellence.

1. ASK THE TOUGH QUESTIONS

There is no doubt that standardized agendas and processes are essential to any organization's operations.

Consistency in application of the plan provides fertile training ground for new associates. Further, it serves as a measurable component by which to create performance standards for all associates.

The first question a leader should ask is: Do we have an operational standard for preconstruction being used by every project manager, estimator and superintendent/foreman? If the answer is no, you have your first obstacle to overcome. The second question: Is

our preconstruction process stale and stagnant—too focused on checking boxes and less about constructive dialogue about project challenges? If the answer is yes, your process likely resembles more of a dictation rather than a collaboration. Leaders must address this albatross draped over the neck of their project teams. But the questions shouldn't end here. The following difficult inquiries should be posed to the project teams before they mobilize:

- How will you address budget shortfalls?
- What project aspect provides the most cause for concern?
- How will you approach project roadblocks?
- How will you increase profit margins during the project?
- What innovative construction methods will this project use?
- What crew blend maximizes utilization, productivity, efficiency, quality, etc.?
- What is the project's greatest risk (safety or otherwise), and how will that risk be addressed?
- How will this customer become a promoter for the firm?
- How will the team develop itself internally?

Often, preconstruction planning goes through the perfunctory elements related to scheduling, deliverables, submittals, permitting, contact information, etc. This is important information, but it merely skims the surface of the project and fails to garner the level of brainstorming required for a winning project approach. And it certainly fails to move construction organizations forward with an innovative approach to project delivery.

2. PLAN PRACTICALLY

Another disconnect that often arises is a firm's inability to transfer knowledge into action. A plan is constructed in the conference room, but when it hits the jobsite trailer, it falls into a circular file. Lean construction advocates the concept of pull planning (in which all stakeholders plan collaboratively from the desired end result backward) along with a planning mechanism that drives the appropriate use of resources at the right time.

The effective use of this process begins at the preconstruction stage, whether in conjunction with a general contractor/construction manager, or within the confines of the trades. The first work plan of the project that defines the labor requirements, equipment, etc. should be done in the initial preconstruction meeting between the field leader and the project manager, which establishes the right cadence for the project from the outset but does not serve as the schedule.

Far too often, contractors rely on a schedule that may or may not reflect reality. Instead, the plan—set from day one—should be a reflection of how the team will accomplish said schedule.

3. HIT THE RESET BUTTON

There are times when personnel changes happen, even before a project breaks ground. When a project team changes, ask yourself: Did the change hit the reset button on the planning process? It's

foolish to place new players on an old project plan, as no one truly owns the end product. A new team calls for a new plan.

4. CHALLENGE ASSUMPTIONS

No one particularly likes having their ideas challenged. It creates perceived conflict and friction. Consider the estimator that has feverishly put together a substantial proposal with incredible time constraints. Now, think about how that estimator feels when they hear, "What were you thinking?"

Even with an inquisitive rather than accusatory tone, the sentiment has a tinge of interrogation. Challenging an estimator's assumptions is meant to serve as a vehicle to create constructive dialogue about how a firm will excel.

The concept of "red teaming," as developed by author Bryce Hoffman, is a process that explores the use of a specialized internal team to challenge firm/project strategy as if it were an enemy force on the battlefield. This is a practical exercise to incorporate into the preconstruction process.

Consider having a team that serves as the "enemy," or plays devil's advocate, poking holes in the project plan, or even posing as the customer or designer during a mock critical-decision-making process.

Studies positively correlate the amount of time spent planning and the return on investment. Haphazardly putting together a written plan simply to feel good about accomplishing a meeting is not an effective use of time, nor does it achieve the goal it was intended to in the first place. Checking the boxes or pencil whipping will only serve the pencil, and it will use a lot of lead. CBO





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Achieving the Win-Win Sale of Your Business

3 tips to help you & other company stakeholders ace this critical transaction

BY TODD A. FEUERMAN

ne of the most difficult processes that a privately held construction company will face in its lifetime is the transition of the business to new ownership. Family, key employees, competitors, financial investors and investment firms all play critical roles in its success. The following tips will help ensure the final outcome is beneficial for everyone involved.

1. COME TO GRIPS WITH REALITY

Creating and implementing a formal business transition plan helps the selling party to properly document their goals and objectives. Without a formal plan, the chances of a successful transition are greatly lessened. A solid succession plan should address how to retain key employees; minimize business interruption and disruption; maximize enterprise sale value; minimize tax obligations; handle unexpected life circumstances and business changes; and ensure the business operates as if a sale is not going to take place.

While construction company owners have vast knowledge of their respective specialties, most have limited experience in the sales and divestitures of their own business interests. Not only must an owner decide on the proper course of action, he or she must also be prepared



to address and resolve any unanticipated issues. Additionally, they must consider the possibility that the plan falls through.

The chances for a successful sale and transition are impacted by a number of factors, but there are four mistakes most prevalent during the transition process:

- Failure to identify and prepare the next generation of company leaders
- Failure to implement the proper executive leadership team, operating systems and advisors
- 3. Failure to properly communicate and

- negotiate the long-term vision of the company with stakeholders
- Failure of the business owner to realistically view the transition process from a financial and emotional perspective

Even if the transition is properly contemplated, planned and executed, companies will likely face a variety of challenges, but a transition team can help to manage the process and support leadership. The team can be comprised

of high-level current employees or family members who have served in the organization. Given the extra time and efforts on the part of the transition team, financial incentives should be considered for these key individuals' service.

The transition team must consider the company's financial responsibility to its stockholders and decide whether the company will be better off sold to a third party rather than internally to family or employees. Leadership should also think about the pros and cons of selling to a competitor, strategic or financial buyer.

Lastly, leadership should work with the transition team to ensure that the process is efficient while maintaining culture, philosophy, reputation and profitability to maximize the financial return to the owner.

2. VALUATE THE COMPANY FAIRLY

Ultimately, a successful sale will depend on the valuation of the company. Construction company valuations can be tricky, and there are several elements that can impact that process. Construction companies will be evaluated based on their ability to bid work successfully and identify high-risk cost areas early in the bid process. Potential buyers will also look at the company's ability to complete projects on time and in line with profit expectations, as well as their ability to identify, negotiate, resolve and collect change orders. The same goes for field issues.

Lastly, construction companies must demonstrate their ability to manage the unique factors of the market, such as effectively negotiating material prices, controlling labor costs, addressing construction delays and contract modifications, managing construction claims and litigation, managing subcontractor performance issues, and working with poor site conditions.

Contractors with the highest value generally have a healthy balance sheet, strong working capital, minimal line of credit borrowings, strong bank and surety relationships, and minimal historical and prospective exposure to severe job losses and contract litigation. The ability to maintain a strong quality of geographically favorable backlog projects with minimal booking risk and profit-erosion exposure increases value as well.

Not surprisingly, the best time to sell a construction company is when the construction market and backlog of jobs is strong, with healthy profit margins. But what can be missed is the biggest way to measure value—people. Employees are the key to value, so it is essential to ensure that those who are critical to business development, estimating, operations and field support continue to run a successful construction company.

3. DECIDE HOW TO SELL

Leadership must consider the pros and cons of each type of sale. Many familyowned businesses prefer to keep the business in the family. Of course, when working with family members, one must be sensitive to the feelings and ambitions of those involved. Transitioning to family members or key employees via sale, while well-intentioned, might lead to uncovering weaknesses where the company previously exhibited strength. These weaknesses may be attributed to a lack of management, financial shortcomings, poor business development, and a lack of executive leadership and/or entrepreneurial skills.

While some owners prefer to pass their business on to family members or key employees, a third-party sale generally leads to the strongest financial gain, as it's typically the best opportunity for the company's shareholders to maximize value and liquidity while minimizing risk. However, the external sale creates the most exposure to future change in operations, employees and culture. An investment banking firm experienced in construction-related transactions is often used to facilitate this sale process.

An internal sale requires the new management team to secure funding from a bank or investment firm to buy out the current owners. Or, the existing owners self-finance the transaction. Banks generally frown upon providing debt to be used for owner redemptions, and these transactions typically create unwanted owner exposure and an unpaid note during the redemption period.

An employee stock ownership plan (ESOP) trust is formed to acquire stock from the selling owners in exchange for liquidity. Shares are then allocated over time to the accounts of eligible employees based on various factors. The ESOP method creates significant tax savings to the selling shareholders, as well as to the company, if the company makes an S corporation election.

A recapitalization occurs when the current owners identify a financial partner willing to acquire a majority of the stake in the company. The financial partner typically invests heavily in the company and ultimately seeks a premium with a 3- to 5-year exit window. Traditionally, a financial partner is a private equity, mezzanine or financing firm that's developed a particular niche in the construction industry.

When a contractor is seeking an exit plan, it is imperative to consult with a team of professional advisors, including financial, tax, investment banking and legal experts. Going it alone could likely be a choice business owners live to regret. CBO

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Addressing Impairment in the Workplace

Empowering teams to take ownership of their collective wellness & safety

BY MARK PEW

very activity in construction requires both attention to detail and spatial awareness. To maintain a safe working environment, every person on the job has to show up with their A-game.

Impairment affects a worker's ability to do that, whether it's through diminished ability to function and operate on the jobsite or the total inability to work.

TOTAL INABILITY

Drug use is what most people think of when they hear the term "impairment."

There are many substances that create impairment, from legal drugs, like alcohol and prescription painkillers, to illegal drugs, like cocaine and methamphetamine.

The list also includes marijuana, for which there is evolving legislation—illegal at the federal level but legal to some degree in 46 states—and its mere presence does not necessarily mean impairment. This is further complicated by the explosive growth of hemp (legalized by the 2018 Farm Bill) and cannabidiol (CBD), which produce no impairment.

Regardless of the substance, impairment is a societal problem. Consider the following statistics from reports on alcohol use in the United States:

 Centers for Disease Control and Prevention (CDC)—Twenty-nine people die every day in motor vehicle



crashes that involve an alcoholimpaired driver.

- National Institute on Drug Abuse (NIDA)—Roughly 20.7 million people aged 16 or older drove under the influence of alcohol in the past year.
- State Accident Insurance Fund Corporation (SAIF)—Approximately 7.1% of workers drink alcohol during the workday.

The construction industry has an especially difficult time with substance use. According to the American Society of

Safety Professionals, "The injury rate for construction workers is 77% higher than the national average, and nearly 15% of construction workers deal with substance abuse."

In Massachusetts, from 2011 to 2015, "those employed in the construction and extraction industries accounted for 26% of all opioid-related overdose deaths. This calculates to 150.6 deaths per 100,000 workers, which is six times the average rate for all Massachusetts workers." Additionally, "workers who had longer-term opioid prescriptions to treat

lower-back injuries were away from work three times longer than those who were not prescribed opioids."

Could driving under the influence be a problem for a construction company operating a 27,000-pound dump truck? Could being cognitively impaired create quality or safety issues for the construction worker, either at the foundation or the 35th floor of a new building? Could intoxication be a hazard to the ballet of people, machines, equipment and other moving parts on a construction site? Not only is the answer yes to each of those questions, but the results of these scenarios could be catastrophic through the impairment of even one person.

This kind of impairment is addressed in corporate drug and workplace safety policies. It is identified by drug tests (pre-employment, post-accident and random) along with supervisory monitoring and performance assessments. Yet, substance abuse it is still rampant. Recognizing and dealing with impairment is especially important to the construction industry, where the occurrence of the "fatal four" methods of death according to the Occupational Safety and Health Administration (OSHA)—falls, struck-by object, electrocutions, and caught-in/ between—can be dramatically increased by impairment.

DIMINISHED CAPABILITY

With all the statistics on drug abuse and the related total inability, it's important not to lose sight of the lesser, but dangerous, form of impairment—diminished capability. While this can be caused by substance abuse, it can also be the result of other factors. A nonexhaustive list published by the Canadian Center for Occupational Health and Safety (CCOHS) includes fatigue; short-term or long-term stress (on the job or at home); preparing for an external event such, as an exam or wedding; relationship issues (on the job or at home); mental illness; side effects from

medical treatment; and traumatic shock.

Impairment at the workplace can also come in the form of mobile device use (which diverts attention), language barriers and toxic negative work environments (in both the physical and emotional sense). One can also be impaired by the reduction of cognitive abilities that comes with aging or disease. As the number of Americans over the age of 65 increases from 40.2 million in 2010 to 88.5 million in 2050, per the U.S. National Library of Medicine, managing an aging workforce will provide increasing challenges. Those issues can create not just absenteeism, but also presenteeism-a condition in which the worker is physically but not emotionally and mentally present, and their lack of focus reduces productivity and motivation.

So, the question is not whether a workplace, including the construction site, has impaired workers. Impairment in the workplace is a reality in 2019, and it reduces quality and safety. The more pertinent question at this point is how to address the problem. Part of the solution is providing more education for management and other staff on how to recognize impairment and use coaching techniques to help impaired persons achieve their potential. As such, the focus should always land on their behavior and should be nonjudgmental and objective.

Building the process of managing impairment into your human resources program requires thinking through what impairment is and how to deal with it. The Canadian Human Rights Commission uses the following characteristics to describe potential signs of impairment:

- Personality changes or erratic behavior (increased interpersonal conflicts, overreaction to criticism, etc.)
- Appearance of impairment at work (the presence of alcohol or drug odor, glossy or red eyes, an unsteady gait, slurring of speech, poor coordination, etc.)
- Working in an unsafe manner or being

- involved in an accident
- Failing a drug or alcohol test
- Consistent tardiness, absenteeism, or reduced productivity or quality of work

Another part of the solution is providing workers with a detailed description of body and brain expectations along with a baseline by which to gauge performance. Without knowing what "meeting expectations" means in relation to their physical and mental job duties, it's nearly impossible to judge whether they can perform a task. As such, having detailed written expectations and consequences is paramount. There are three guiding principles for addressing impairment:

- Wellness—Establish (talk) and model (walk) a culture of physical, psychological and emotional wellness.
- Safety—Implement policies and procedures for recognizing and reporting onsite impairment.
- Education—Cover not only the dangers of impairment (health, family, job loss), but also the benefits of not being impaired.

Any plan of action that fails to address all three of these areas will be insufficient. Ultimately, managing impairment is about whether the employee can do the job they were hired to perform. If they cannot, action is required. CBO

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A Long & Binding Road

3 ways a surety bond claim negatively impacts business

BY ERIC WEISBROT

any states and cities require licensed construction contractors to procure a surety bond to help protect their customers against less-than-professional work. A surety bond works as a type of insurance by protecting the customer from the financial burden of bad business practices. When a customer does not get the work that was promised by a contractor, they can make a claim against a surety bond to help cover any losses they incur.

Whether you work in residential or commercial construction, a surety bond can be a valuable tool. For any variety of reasons, including overextension, financial issues or a lack of expertise in a specific trade, contractors may fail to perform the work they promised. A customer or the state can then file a claim against a bond, which can cause damage to the business in several different ways.

1. INCREASED COST

A surety bond is an agreement between you, the surety agency and the organization or person who requires the bond to ensure they will receive the level of work you promised. When that doesn't happen, a customer or the state files a claim with the bond company to reclaim losses they may have experienced. While the surety bond agency who provided



your bond pays the claim amount, you are required to pay this back over time. The financial burden of repaying a bond claim can be a challenge to overcome, especially if the claim amount is significant.

If you are working to repay a bond claim, it may be difficult to keep up with other personal or business financial obligations. Paying overhead, vendors, subcontractors, insurance premiums and your own living expenses could become challenging in this situation. Compounding the problem, you could face credit issues, or even bankruptcy, due to missed payments.

These financial woes inject stress into both your personal and business lives. For these reasons, avoiding claims is necessary to keep you afloat.

2. HIGHER RISK PROFILE

Another way surety bond claims can wreak havoc is the potential obstacles they pose when you attempt to procure a new bond in the future. Whether your work requires a performance bond, a bid bond or a general construction bond, surety agencies are likely to think twice about offering an affordable option when you have a history

of claims. If you are able to obtain a new bond when your renewal comes around, the price you pay for the bond may be far higher than you anticipated.

Surety agencies take on a certain degree of risk when providing a bond to a construction contractor. They evaluate your personal credit, your business financials and your claims history to determine how much of the total bond amount you pay. Even if your credit history and business track record are strong, claims against a bond will bring the cost of your new bond up over time—another reason to keep your claims to a minimum when possible.

3. TARNISHED REPUTATION

Aside from the financial burdens of a claim against a construction bond, your business reputation is likely to take a hit. While a bond claim may not be made public, a customer who brings a claim

against you was dissatisfied with the work you completed, so they are likely to leave a negative review of you or your business when this takes place.

Jaded customers may also spread the word about their experience with you and your business, making it difficult to get new work in the future. When your reputation is tarnished, you may find it difficult to get new customers, which then leads to reduced revenue for your business, making it difficult to maintain payments to your bond for the claim. Thus, more financial issues are created for you immediately and long term.

Having claims against your bond as a construction contractor is something you want to avoid, if at all possible. However, this does not mean ignoring the issues you faced with customers or job owners. Instead, it entails owning up to the fact

that their claim may be legitimate and then working with your surety agency to resolve the matter quickly.

Your surety agency should have claims specialists who help you navigate the process from start to finish, offering solutions to help you avoid or minimize claim damages to you and your business. A claim against your bond is not the end of the world, but you should prepare to cover the increased cost of doing business; provide proof that you are a good candidate for an affordable bond when your renewal comes; and make right any wrong experienced by the customer. CBO

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ith the ever-increasing focus on safety in the construction industry, it is important to consider safety from a broad perspective—including everything from specific practices adopted on-site to companywide process and cultural changes that impact the way projects are approached. A recent set of studies by Dodge Data & Analytics, published in the Contractor Use of Safety Best Practices SmartMarket Brief, revealed several ways for contractors to better address safety, both on their projects and within their companies.

To gain an on-the-ground perspective, insights on the findings are shared by sheet metal general superintendent at Southland Industries, Henry Nutt III, a thought leader in the industry on the subjects of safety and lean construction. Below, he provides his perspectives on three top findings in the study: the limited use of noise reduction practices, best practices for mentoring subcontractors on safety and health, and the relationship between lean and safety.

1. NOISE REDUCTION PRACTICES

One of the most striking findings in the brief is the opportunity for contractors to increase their use of practices that assist with noise reduction. According to the National Institute for Occupational Safety and Health (NIOSH), construction workers are at higher risk for hearing loss than those in most other professions in the United States. And yet, several practices featured in the study are not widely adopted. Even the most common practice—the use of hearing protection—is used "all of the time" by less than half (43%) of general and specialty-trade contractors.

The opportunity for wider use of other practices is even greater. Low-noise equipment is used on the majority of projects by less than half (42%) of contractors, and only 6% report that they use that equipment all the time. While most contractors (87%) report that their company does advanced planning to reduce noise exposure on-site before construction starts, the majority of them think their company could do better. And the findings are similar for purchasing quieter equipment. Only 45% are isolating loud equipment from the work area more than half the time, and just 35% place loud equipment behind barriers as frequently.

Nutt believes that, right now, the main way for the industry to address this lack of safety practice implementation is to increase awareness. "I think we accept things the way they are because they've been that way for so long," he said. Nutt believes that understanding the long-term effects loud equipment can have on the human body will be helpful for the industry long-term. When asked where awareness training should come from, he calls for the industry, including associations and other organizations, to embrace the issue.

However, Nutt also said, "First and foremost, as contractors, we must start with ourselves, look within and understand the ramifications of the choices we make in order to be in business

and how that impacts our employees' livelihoods. [This includes] listening to our own people and recognizing what hazards may be created by our work." He believes the data is available, and that acting on that data should be a collective effort. "It is a matter of assigning people to do the homework and bring back the information to myself and my colleagues, as superintendents and construction managers, so that we can communicate to our people and our project team to help them offset some of the issues that we're finding."

2. SUBCONTRACTOR MENTORING

The safety climate of a project is influenced by the entire team on-site. The active mentoring of subcontractors plays a crucial role in improving safety climate because it establishes the expectations about safety upfront, and it provides the opportunity for larger companies to share the benefits of their safety resources with smaller companies.

[Training] is as much about reinforcing the safety climate of the project as it is about informing workers of the hazards they face.

This is particularly important, given the consistent findings in other safety research conducted by Dodge Data & Analytics as well, which consistently demonstrates that large companies are more likely to employ good safety management practices than smaller ones.

Unfortunately, though, the findings published in the current brief show that while 95% of large companies mentor their subcontractors, only 58% do so most of the time. In addition, large and small companies do not regard many of the means of providing mentorship to be of equal importance.

Large contractors believe that what small contractors need most to improve their safety and health performance is assistance in conducting job hazard analyses, followed by the provision of safety equipment. What small contractors regard as most important to improve their performance, on the other hand, are printed materials related to site-specific safety and health hazards, as well as toolbox training resources.

As someone working for a large mechanical contractor, Nutt is in the position of both seeing how general contractors (GCs) mentor their subs and engaging in that activity himself. As a lean contractor, Southland sees the mentoring process as based on more than just individual safety practices. Nutt said, "It really comes down to trade partners understanding our culture and our philosophy, as well as how we expect it to become theirs on our project." According to Nutt, it's like developing a partnership with the companies they work with,



and those relationships inform the selection of companies on other projects. Reviewing companies, their history, their safety record and their past ability to embrace Southland's culture and strategies takes precedence over the simple question of price, Nutt says.

He also stresses the importance of how GCs mentor their subs, as it sets the tone for the project, which he regards as crucial to their own efforts to enhance the project's safety climate. Interestingly, Nutt says that an early indicator of the GC's leadership on a project lies in how clean the site is. He said, "A clean job is indicative of the attitude people have about safety because they are investing in someone making sure things stay clean ... [GCs] make sure that policy is adhered to and people put the things away they are responsible for."

He believes a site's cleanliness is also indicative of a larger communication strategy. "They create a camaraderie by doing things that bring out the best in people and highlight small things that go well on projects. It creates a culture that becomes a community. In that community, there are rules about how you want to be treated, how you interact with others and how you deal with conflict—all of which typically depend on the GC setting the tone." He points out that his firm tries to create that leadership regardless, but it works better if the GC has already laid the groundwork.

He also offers some insight into the value that small companies place on materials they can use for immediate training, such as printed materials related to site-specific safety and health hazards and toolbox training resources. He says these materials could be particularly useful to reinforce workers' understanding of risk. He says effective training includes the experiences of people who take shortcuts (risks) and the life-altering consequences that follow.

The distribution of these materials and training, he says, reinforces awareness of hazards, and the investment in these materials demonstrates that the company believes in safety. Thus, the worker recognizes "that the company they work for supports them going through the process of mitigating a hazard."

This realization can positively influence the kind of split-second decisions made in the field that have major safety implications. It is as much about reinforcing the safety climate of the project as it is about informing workers of the hazards they face.

3. LEAN CONSTRUCTION PRACTICES

The SmartMarket Brief also contains findings that suggest a relationship between lean construction and a different approach to improving safety. First, it demonstrates that familiarity with lean construction is widespread, but implementation is still relatively low. Only 29% of the contractors surveyed are not familiar with lean, but only 21% have actually implemented a lean approach at their company. Contractors with a higher familiarity with lean practices are also much more likely to recognize the importance of supervisors' and foremen's leadership skills and enhanced safety on projects.

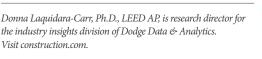
Finally, it demonstrates that the industry sees this connection—over three quarters believe that training for foremen, project managers and superintendents on lean principles would be valuable. This is a higher percentage than those who described themselves as familiar with or implementing lean, furthering the reputation the construction industry has for lagging in the adoption of new technologies and techniques.

However, the study does not explore why there is such a strong connection between lean and safety. As a national board member of the Lean Construction Institute, Lean Construction Institute-approved instructor, member of the task force for Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) and Associated General Contractors, Nutt provides perspective on the roots of that connection. He thinks an important aspect of lean building is having respect for people, a concept that he said, "is simple enough, but it's not necessarily something that has been done in the construction world, specifically."

He describes how the adoption of lean principles "creates an environment where there is a dialogue about the work you are about to embark on" across the entire project team. Lean principles create a team effort across the project, he insists, based on the tenets of respect for people and value for the customer. Nutt describes this change as a mindset that says, "This is not just about my company making money; this is about our project making money." When people buy into this, there's a visual, transformative effect. "You have a job with people who are actually smiling and happy," Nutt said.

Nutt said, describing his role in supporting this effort, "My job as a superintendent and a lean practitioner is to not only talk about how to be more productive, but also to understand other issues, like our attitude toward how we do our work, treating people as a trade partner versus a subcontractor."

It is the communication and the creation of a team environment that ultimately helps reinforce the safety climate on-site. CBO









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OF DEFEATING ITS PURPOSE & HOW OPERATORS CAN HELP

dvancements in technology and the ongoing evolution of equipment are among the most widely discussed trends in the construction industry today. Topics like telematics, hybrid-powered equipment, electric power and autonomous operation usually get all of the attention and glory, but the safe operation of machinery has been, and continues to be, the top priority for equipment manufacturers.

Equipment industry standards and regulations committees regularly focus on the topic of safety devices. Back-up alarms, perimeter lighting and rearview cameras are already being used by many manufacturers, and devices like proximity detection sensors and collision awareness systems are quickly gaining widespread acceptance.

As the technology advances and becomes more reliable, original equipment manufacturers (OEMs) have a long history of adding the proven systems to their equipment. Seatbelts, rollover protective structures (ROPS) and safety glass have been extremely successful in protecting workers over the years. Now, most manufacturers include safety systems on the majority of machines. (This is not necessarily due to any regulatory mandate, but simply because it's the right thing to do.)

While many of these technological advancements have made significant improvements to jobsite safety, and have built greater awareness for worker safety in general, a number of other factors could potentially undermine their effectiveness.

DECREASED ATTENTION SPAN

When it comes to humans interacting with technology, generally, current studies aren't focusing on the benefits of the technology itself, but rather on how it's affecting people. Many experts in the field theorize that the onslaught of new technology (mainly focused on mobile devices) is eroding attention spans.

Studies like these argue that humans scan information so quickly that they no longer take the time to read slowly enough for comprehension, and their interaction with technology is becoming more impulsive and impatient over time. If these theories are valid, what ramifications could they have for the construction industry, where awareness is critical for safety? Will the safety devices mentioned previously be as effective if a worker's attention span is not as long as it should be?

COMPLACENCY

All of this begs an unsettling question: When it comes to equipment safety specifically, how much technology can be added before the equipment operator becomes overwhelmed?

Equipment operators are human. They deal with physical and mental stress, fatigue, and the pressure to meet deadlines. Even the best technology available will not eliminate these issues. If equipment operators become accustomed to the repetitive warning sights and sounds, day in and day out, they are at risk of becoming complacent—trusting in the technology's intended purpose and simply ignoring the warnings when desired.

Even though operators should rely on their training, hand signals and the equipment's safety systems in their work, is it possible they still suffer from sensory overload and distraction?

LIMITED EFFECTIVENESS

Yet another factor to take into consideration is that equipment safety devices are not one size fits all. While a certain technology might work well in one environment, it may not perform as effectively within another piece of technology.

Whether it's construction, demolition, mining or forestry work, dirty, dusty and wet environments can affect the performance of most safety features. Back-up cameras, proximity alarms and sensors can have their effectiveness limited in certain worksite conditions. In such situations, will workers become so reliant on technology that they begin to take it for granted, placing themselves in danger by failing to consider the technology's limitations on the jobsite?

There's also the concern of equipment operation itself and how it can hinder the effectiveness of safety devices, such as back-up cameras. For example, high-vibration exposure might render the technology useless if it's not robust enough to withstand the rigorous movement of a heavy-duty machine. In addition, remote camera mounting locations may be required to avoid the impact caused by normal operational requirements or the size of the equipment. The more remote, the more impact on performance and the more difficult to access for cleaning (e.g. the height of camera placement due to machine design can affect image quality).



ARTIFICIAL INTELLIGENCE

When implementing technology that uses artificial intelligence (AI) for autonomous operation, a number of other challenges arise. For example, automatic emergency braking as part of a collision-avoidance system may be straightforward to the automotive industry, but it's a tremendous challenge for the heavy-equipment industry.

Other, more complex factors must be considered when applying artificial intelligence to big equipment, and construction sites have more variables to consider than mining sites. Ground conditions, nominal payload, payload distribution, increased variation in operational skill levels—all create numerous challenges for applying safety technology that calculates the different types of hazards.

The open nature of many jobsites does not allow for some of the simplest inputs available in automotive applications, such as clearly defined, paved lanes; intersections; and signs. False positive detections can easily be introduced on the jobsite, which can create hazards due to braking on curved paths or locations with poor underfoot conditions (especially at high travel speeds).

Furthermore, the travel speeds and mass amounts of construction equipment on-site make the dynamics of braking far more complex. Many of the different machine forms and intended tasks on construction sites demand a wide variety of safety features for the unique safety challenges of each machine. For example, excavators have entirely different risks and avoidances than wheel loaders or haul trucks. Space constraints, especially on smaller machines, can be an issue in applying new technologies.

The equipment operator is often in the best position to make the appropriate braking decision for the site-specific conditions. Taking control away from the operator with an automated safety system may not always result in the best outcome.

When it comes to automotive applications, as conditions become more challenging, systems are automatically disabled, thereby placing control back into the operator's hands. For instance, in some vehicle models, the adaptive cruise control and auto-braking system are disabled during poor visibility.

Also note that the use of automated systems can result in reliance on the system by the equipment's operator, which could become an issue when they move to a machine without those features. Field conversion of older machines to those types of automated systems could be difficult and cost-prohibitive.

When applying automated safety technology, it's a challenging task to determine when to take control away from the operator. Ultimately, the operator of a machine should remain in control when possible, and they are responsible for its safe operation.

THE BOTTOM LINE

Business owners must understand that technology, while advancing the cause of safety on the jobsite, is not perfect. Technology has limitations, not only within the environment in which it's expected to function, but also in the way it's used by the operator.

Regardless of the technology being used, the key to ensuring safe operation of heavy equipment is to ensure the operator's commitment to safety. Not only do they need training, but they also need to consistently participate in safety programs, engage in toolbox talks and help to cultivate a culture of safety awareness.

There's no overstating the value of technology's ability to reduce safety risks. However, it remains critically important to recognize that an equipment operator's safety awareness provides the greatest possible protection.

That awareness, though, can only be achieved as a result of a full commitment on the part of an organization to implement and adhere to a robust safety program—one which extends all the way from the boardroom to the trenches. CBO

Jaime Vos is the director of safety materials for the Association of Equipment Manufacturers (AEM). For 5 years, Vos has overseen the safety materials program, which offers a full line of safety manuals that detail the correct preparation, operation and maintenance of off-highway equipment across all industry sectors, including construction. Visit aem.org.



USING AI & COMPUTER VISION TO ELIMINATE INEFFICIENCIES & IMPROVE SAFETY

he construction industry is a critical piece of the global economy, with over \$10 trillion in annual spending—equal to 13% of the global gross domestic product—according to the McKinsey Global Institute. Yet, the industry has been lagging behind other industries in core areas like productivity, safety and digitization for years.

The largest and most complex construction projects in the world require massive amounts of resources and completed work daily, making it nearly impossible for project managers to grasp everything occurring on-site. This complexity can lead to safety issues and potentially even worker injuries or deaths.

Despite strong commitments to safety via state-level regulations and company safety policies, one in five worker fatalities take place within the construction industry, according to osha.gov. However, the recent explosion of investment in construction technology and applications aims to change the way the industry designs, manages and executes projects, helping contractors to stay on budget and on schedule while maintaining a safer workplace.

A recent BuiltWorlds report revealed that, in this year alone, more than \$1 billion of investment funds will be poured into construction technology firms, with the goal of giving contractors the tools to boost productivity and improve safety on-site. The wave of diverse start-up firms entering the industry is transforming all stages of the construction project life cycle. Solutions, such as management software, robotics, internet of things (IoT)/wireless sensors, artificial intelligence (AI) and more, are all being developed and deployed to help eliminate the productivity deficit and improve safety.

THE TOOLS

One solution set that allows project managers higher levels of visibility into projects is the integration of computer vision and AI science with existing site imagery and construction modeling software, such as building information modeling (BIM). There are multiple companies applying this technology to get ahead of project inefficiencies by tracking quality of work, productivity and safety. For example, some companies use cameras attached to autonomous

vehicles to inspect the site, both indoors and outdoors, on a daily basis. Algorithms then inspect installation quality and provide real-time feedback on productivity.

Other solutions include the use of drone imagery to construct 4D models displaying site reality versus site plans by overlaying the images captured with BIM atop the project schedule. Construction progress, productivity rates and risk for potential delays are then communicated to the construction team.

Some companies capture videos or images of the site and then apply an AI engine to analyze the content and automatically detect hazardous conditions. In addition, they use predictive analytics to focus on areas of increased risk. This solution allows managers to identify high-risk areas due to site conditions or employee behaviors that may be noncompliant with safety standards.

Computer vision is the process of using computer systems to understand and analyze imagery. The science allows systems to see in a human-like nature by compiling pixels contained in an image and processing them to form objects and shapes. Through continued exposure to images, deep learning algorithms teach the system to interpret and analyze what it sees. Eventually, the system is able to take an image and distinguish materials, equipment and components, as well as any other structures seen on a jobsite, based on factors like color, shape, size and location.

Then, computer-vision capabilities are leveraged by using AI to perform analysis and make decisions based on what the system sees. By overlaying the imagery captured with BIM and other project models, the system can detect and highlight inconsistencies between the images and models. This ability gives insight into deviations from design, incorrect installations, how current developments stack up against the project schedule, as well as daily progress.

In addition to computer vision and AI technologies, wearable devices have strong potential to reduce safety incidents and improve worker conditions on-site. Devices that increase visibility and accountability across jobsites are now available, showing how many workers are on-site and where they are, which allows supervisors to quickly locate missing persons. These devices clip onto the worker

and are able to detect rapid elevation changes, and, in turn, notify designated supervisors of the exact location and distance of a fall.

This visibility and accountability afforded by these devices help to improve emergency response time. Additionally, workers can report jobsite hazards or accidents via these devices and trigger an alarm that will be transmitted from every device on-site in the event of a necessary site evacuation. Some devices attach to machines on-site and integrate with other wearables. These devices can detect when workers are near and send notifications to supervisors when unauthorized personnel are operating machines.

THE RESULTS

Along with their ability to keep projects on schedule and budget while improving safety, many technologies new to the construction market have the potential to reduce risk and positively impact insurance rates. By being able to deter risks, such as construction deficits, cost overruns, contractor default, project delays and injuries, the probability and severity of losses associated with corresponding coverages, such as workers' compensation, are greatly diminished.

As the construction industry evolves, these technologies are increasingly able to integrate with each other and share data across devices and platforms. Many feed data into construction

management software or BIM systems, allowing contractors the opportunity to pinpoint past incidents and to take preventative measures to improve future outcomes. The positive effect on a contractor's claim and loss history should lead to lower insurance premiums and the opportunity to procure more favorable coverage terms and conditions going forward.

When computer vision and AI science are integrated with BIM and other project plans to address some of the industry's biggest issues, productivity and accuracy is greatly increased. Additionally, wearable technology addresses the ever-present concerns related to worker safety. Introducing wearables on-site provides a fuller picture of operations, allowing employees to better prevent and react to safety hazards. CBO

Matt Ostrowski is an analyst at Aon Infrastructure Solutions, Aon's risk advisory group focused on alternative project delivery. Ostrowski provides analysis and project management expertise to ensure deliverables for those engaged in public-private partnerships (P3) and other infrastructure projects. Ostrowski's expertise includes commercial insurance knowledge, as well as risk identification and mitigation. He holds an associate's degree in risk management and a construction risk and insurance specialist designation. Contact Ostrowski at matt.ostrowski@aon.com. Visit aon.com.



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REAL JOBSITE SOLUTIONS

As a construction business owner, every decision you make directly affects your success, but even more so when it comes to projects. This section is designed to introduce contractors to some of the industry's most effective solutions, inform decision-makers of new opportunities and share successes.

The construction companies in the following pages drive project success by partnering with top suppliers and manufacturers providing innovative products and services. Real Jobsite Solutions explores the real-life success stories of business owners just like you and the tech, tools and equipment they employ on-site.





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AIA Contract Documents

How AIA Master Agreements can save you time & money

Contractors nationwide use AIA Master Agreements to streamline project details with the parties they work with regularly. There should always be an agreement in place between the parties before a iob starts. A contractor and owner who work together frequently typically have their attorneys negotiate an agreement. When the same contractor will be hired to construct multiple projects, the parties will benefit from an agreement that establishes common terms and conditions applicable to all work. This avoids additional contract negotiations and is where AIA Master Agreements come in to play.

SIMPLIFYING THE CONTRACT REVIEW PROCESS

The attorneys will review all the major, risk-shifting provisions and create a baseline—the master agreement—for future projects between the parties. This master agreement solidifies general contract provisions, such as indemnity, insurance requirements, waivers of consequential damages or stipulations for working with hazardous materials that will apply to each work order.

Use of a master agreement, plus a work order, creates a contract. This contracting method allows multiple scopes of work to be issued quickly, without the attorneys renegotiating the contract. Generally, the work order is straightforward enough that the parties can complete it themselves. It will address the scope of work, price, time and other project-specific details.

Most AIA agreements are meant for use on a single project, and an agreement concludes when the work has been fully completed and the final payment has been received. On the contrary, a master agreement is effective for one year and renews automatically,



unless either party provides 60 days' notice of its intent not to renew. When a new project comes around, the parties can simply add a work order under the umbrella of the original master agreement. The master agreement helps contractors and owners streamline the contract review process and spend less money on attorney fees.

OWNER/CONTRACTOR MASTER AGREEMENTS

- A121-2014—Standard Form of Master Agreement Between Owner and Contractor where work is provided under Multiple Work Orders
- A221-2014—Work Order for use with Master Agreement Between Owner and Contractor

ARE YOU USING THE MOST UPDATED AIA DOCUMENTS TO PROTECT YOUR PROJECTS?

AIA Contract Documents made notable revisions to its core set of documents in 2017. The most significant 2017 revision to the A201 family of documents is the creation of a flexible Insurance and Bonds Exhibit to accompany the key owner-contractor agreements. By using the new insurance exhibit, owners and contractors can select insurance coverages specifically tailored to the needs of the project. Visit aiacontracts.org/cbo for samples of the 2017 owner-contractor agreements.

AIA Contract Documents aiacontractdocs@aia.org aiacontracts.org



Alliance Tire Americas

Construction powerhouse C.C. Carlton Industries demands loader tires that last

Matt Gillum, fleet manager for C.C. Carlton Industries, doesn't have time for tire problems. He is responsible for 186 pieces of machinery spread across all sorts of construction projects around central Texas, from subdivision developments to lake excavation to utility installations. The one thing he can count on is that his tires will take quite a beating in the rocky conditions at most of those jobsites.

"Ninety-five percent of our work is in rock," Gillum said. That means Gillum needs tires that resist chunking on rock; don't crack in the blazing Texas summer sun, and can get traction when storms turn the area's calcium-rich caliche soils into slick calcrete. He said he was impressed when Mike Youngblood,

owner of Youngblood Automotive and Tire in Austin, Texas, and Gillum's tire advisor, introduced him to the Primex RS 300.

DENSE BLOCKS

With a rugged block pattern, sharp shoulders for grip and massive mid-rib designed for rock quarries and other severe environments, the RS 300 has delivered exactly what Gillum needed for his loaders. "I like the tread," he said. "It's less likely to chunk. It's a tighter pattern, but it still works great, even in a slick caliche or clay."

In the competitive construction business, Gillum appreciates that Primex RS 300s deliver a lower cost of ownership than top brands and perform just as well. "I'm getting 2 to 3 years out of a loader tire from Galaxy and Primex," Gillum said. "The ride quality and wear are side by side in a construction world with Tier 1 tires." The high rubber-to-void ratio of the RS 300 tread pattern helps ensure a long service life, as does the severe-duty compound, a special formula that is flexible enough to minimize chunking and slashes, but hard enough to reduce the steady wear of abrasion. Then there are the tough sidewalls, which are engineered to be stiff enough for stability, but with enough flexibility for a smooth ride, which helps keep equipment operators productive.

DOUBLE THE LIFE

Gillum requires all his operators to go through daily and weekly checklists that include careful attention to tire condition and inflation pressure. Staying on top of tire issues keeps his equipment rolling and prevents costly downtime. That careful attention to tires also taught Gillum a thing or two about squeezing the most performance from them.

"We have gotten completely away from directional tires on blades," he said. "Directional tires just wear too fast on them, and you can double the life of your loader tires with rotation. Ninety percent of the time, loader tires will wear faster on the fronts. You're going to hit that pile low and lift that front axle up a bit. Then, it spins while that back tire is pushing."

Gillum said he has never had a Galaxy or Primex tire failure. That's quite a feat in the construction business—especially a construction business in the rugged, rocky conditions of central Texas.

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Plus, the skid steer version of the Hulk SDS is mounted on a 16-inch rim to give you more than 4 times more usable rubber to the 60J line. That's extra wear even after the tread is gone. It all adds up to lower total cost of ownership – and a higher return on investment.

Talk to your Alliance Tire Group (ATG) dealer about the Galaxy Hulk SDS, visit www.atgtire.com or call us at (800) 343-3276



Bobcat Company

How Graeme Robertson turned a setback into a comeback

In his early twenties, Graeme Robertson walked away from equipment contracting. A natural in the seat of a machine, he went searching for a steadier paycheck and found it as a carpenter. That is, until injuries from a snowmobile accident left him unable to climb ladders. While it was only a minor setback, Robertson had to figure out how to pivot his career—again.

"My doctor said, 'You're probably better off just opening your own business," Robertson said. It was the nudge he needed to launch Dugald, Manitobabased GJR Contracting in 2011—one of his most profitable decisions yet.

"I never wanted to manage anyone," Robertson said. "I'm pretty picky about the way jobs get done, and I might as well just be doing the work myself if I have to watch over somebody all the time. I look for ways to keep the business moving forward with what I can do for customers myself, making sure they are happy when I'm done."

Carving out a successful sole proprietorship in the Winnipeg market meant outsmarting the competition with a streamlined approach and a simple but effective business strategy. That strategy? Start small; stay lean; and make your dealership and equipment your ultimate business partners.

"Everybody knows me for that piece of equipment & they know where I can go with it & what I can do with it."



FULL-SERVICE CONTRACTOR

Robertson started the business with the purchase of a Bobcat E35 compact excavator. He went to work performing residential demolition and landscaping projects, along with commercial site prep. He filled in equipment gaps by renting extra machines and attachments that could perform niche tasks within those core services, such as breaking concrete, digging post holes and trenching for retaining walls, drains and electrical conduit.

"Everybody knows me for that piece of equipment, and they know where I can go with it and what I can do with it, so I wanted to stay in that same size class," Robertson said.

In 2017, Roberson upgraded to the new R-Series E35 excavator. He leverages all the advantages of the machine to meet the tough demands of his residential demolition sites, where he levels a singlestory home or a garage nearly every week. On one jobsite, he was hired to remove

an old, single-car garage located behind a home in a confined neighborhood. The job required him to operate in a short driveway and alley.

The excavator's hydraulic clamp took massive bites out of the roof and walls and easily grabbed the garage door and large, irregular chunks of debris for more efficient cleanup.

With the garage torn down, Robertson replaced the bucket with his hydraulic breaker to fracture the garage's concrete floor, as well as an adjacent patio and decorative fountain.

"I can completely disassemble a building with my clamp, and my breaker is so strong that I can bust the concrete out from underneath it," Robertson said. "I can load it all up in a bin, and leave the site looking like nothing was ever there."

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Caterpillar

Why Savage Excavation relies on the Cat 308 Mini Excavator to get the job done

In 2000, Savage Excavation started serving residential customers facing space constraints with a team of 25 crew members. When working on the side of steep hills, the company turned to the new Cat 308 Mini Excavator to help get the job done.

This next generation Cat Mini Excavator features an industry-first stick steer control, which revolutionizes the way excavators are operated by improving machine travel, comfort and productivity. It allows precision control of machine travel with a joystick, instead of the floor-mounted travel levers typically found in excavators.

Savage Excavation was able to take advantage of several new features and upgrades, including:

- Full-color LCD monitor with Bluetooth phone and audio capability
- Hydraulic quick coupler for ease of changing attachments
- Quiet, spacious cab with air conditioning
- Lower fuel consumption and greater productivity

As a company who strives to get more than 10,000 hours from each machine, the durability and longevity of the Cat 308 Mini Excavator is key.

"Overall, the machine is phenomenal. There's no downtime, which saves us a ton of money," said Ray Simpson, owner of Savage Excavation.

Located 3 hours from Denver, Colorado, Savage Excavation also relies on the local dealer's—Wagner Equipment—support from Caterpillar.

"Generally speaking, with anything we need, if it's in the state of Colorado, it's to us in Carbondale by the next morning, which is critical for us," said Simpson.

These mini excavators are part of Caterpillar's new-model lineup, including the 307.5, a standard tail swing model with a fixed boom; the 308 CR VAB, featuring a variable angle (two-piece) swing boom; the 309 CR, a new model in the mini range featuring a compact radius, swing boom, and high-flow auxiliary hydraulics; the 309 CR VAB, which expands the 309 CR's capability with a variable angle boom; and the 310, also new to the range, featuring a fixed boom, standard tail swing, and twin blade cylinders for handling heavy-duty dozing chores.

The new models range in maximum operating weight from 18,152 to 22,447 pounds and with maximum dig depths from 15 feet, 3 inches to 17 feet. The variable angle boom, available with the 308 CR VAB and 309 CR VAB, enhances digging capability in congested work areas. Powering the 307.5 is the Cat C2.4 turbo diesel engine rated at 55.9 net horsepower. The five larger models use the Cat C3.3 diesel engine rated at 70.3 net horsepower.



Caterpillar 919-465-2821 estrada_estela_m@cat.com cat.com/miniex-cbo



Doosan Infracore North America LLC

Advanced Wall Structures builds a business moving 12-ton rocks

Matt Quinnell has logged thousands of hours operating excavators. The 29-year-old Minnesota native currently works in the family business building boulder retaining walls in the growing Minneapolis suburbs.

"We work for a lot of national home builders, as well as local companies, to help them develop sites," Quinnell said. "Builders just call us, and we take care of what they need. We are backlogged 6 months with work—sometimes, up to a year."

Quinnell's parents started Advanced Wall Structures in 1992 building block retaining walls with skid steer loaders and compact excavators. When developers began shifting from traditional block walls to boulder walls made from natural stone, Advanced Wall Structures followed suit. Building boulder walls now makes up 90% of the company's business.

BRINGING WORK IN-HOUSE

Lifting and placing boulders required the company to purchase larger machines. The power and versatility of Doosan equipment, including four DX235LCR-5 excavators, one DX140LCR-5 excavator and a DX85R-3, has helped Advanced Wall Structures bring work in-house that it previously subbed out to other contractors. "In the past, a lot of the excavation was done by other companies, and we came in and built the retaining walls," Quinnell said. "Now we get into a lot more excavation. We move a lot of dirt for a company our size—on top of building the walls."

Quinnell estimates his company builds 60,000 to 70,000 square feet of boulder walls a year. Operators first prepare the ground using the excavators with plate compactors, then Quinnell pairs a Doosan excavator with a hydraulic rotating grapple to lift, rotate and place



the boulders. "I can pick up rocks that are II or I2 tons," Quinnell said. "I can't believe some of the things that the excavators can do as far as moving weight and using the force they have. We push our machines to their limits and beyond."

IMPROVED VISIBILITY

One of the company's newest Doosan machines, a DX140LCR-5, came equipped with rearview and sideview cameras, which help Quinnell improve his operating efficiency and accuracy when placing boulders.

"I usually have my camera up on my screen when I'm working in a tight area," Quinnell said. "I can check the straightness of the wall with just the camera, so I don't have to get out anymore."

Quinnell estimates he spends between 1,200 and 1,500 hours in the excavators each year. "I remember seeing someone building boulder walls when I was younger, and I said, 'One day I want to do that," Quinnell said. "I love it. People

always joke with me that I play Tetris all day long, but it's an extreme form of Tetris with 5-ton rocks."

Doosan Infracore North America LLC, headquartered in Suwanee, Georgia, markets the Doosan brand of products that includes crawler excavators, wheel excavators, wheel loaders, articulated dump trucks, material handlers, log loaders and attachments.

With more than 150 heavy equipment dealer locations in North America,
Doosan is known for an unmatched dedication to service and customer uptime and durable, reliable products.
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DOOSAN.





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Foundation Software

Wells & West General Contractors Inc. finds focus with the right accounting software

Wells & West General Contractors Inc. takes pride in being considered its clients' in-house construction company. Wells & West is a midmarket general contractor that focuses on projects close to home in the Colorado Springs, Colorado, area because, as Project Manager Eric Swanson said, "We like our guys to be able to sleep in their own beds."

It's this commitment to both client and family that makes Wells & West a natural fit for client- and family-focused Foundation Software Inc., developers of the powerful FOUNDATION construction accounting software.

LIFE WITHOUT FOUNDATION

Like with any family, there were some inevitable growing pains. A longtime user of FOUNDATION, Wells & West experimented with different accounting software in 2017, and then promptly returned to it in 2018. Swanson explains that the software the company tested

during this period was "remarkably difficult for your standard, off-the-street Joe to come in and figure out what was going on." Not only was it difficult to use, Swanson also had concerns about the accuracy of its reports: "We couldn't get it to give us decent, meaningful, reliable information. It was too complicated." After only a year, Swanson and his team were back with FOUNDATION.

RETURNING TO FOUNDATION

"It comes back to meaningful financial reporting for our accountant," Swanson said. After the year of struggling to get any meaningful data, Swanson and his team were relieved to use FOUNDATION again. With FOUNDATION's date-driven reporting, the team at Wells & West were able to quickly get the information it needed—all with complete confidence in the accuracy of its reports.

And though all software programs bear some cost, Swanson admits that

returning to FOUNDATION was the most cost-efficient solution. Due to the complexity of the company's previous software, "We would have needed someone working a full-time, \$70,000-a-year position. With FOUNDATION, we can manage with our regular staff people," Swanson said. "FOUNDATION is straightforward enough that someone without a degree in computer science can get in and use it."

STILL GOING STRONG

With the wide range of job-cost reports available in FOUNDATION, Swanson is able to get the information his team needs to make the most cost-effective decisions for the business, adding, "We're starting to use more of the internal coding to separate types of projects—medical versus standard versus industrial—to see where we're making money or not and where we need to make changes."

And even after years of working with FOUNDATION, Swanson and his team are finding new areas to explore. "We just had a new report that we were reviewing in our staff meeting this week on our budget vs. actual income. That was really handy," Swanson said.

Navigating the construction industry can be complicated. That's why FOUNDATION takes pride in simplifying the business side of the construction business, so contractors like Wells & West can focus on everything else.

Check out a free demo at foundationsoft.com or call 800-246-0800 to see what America's No. 1 construction accounting software can do for you.

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JCB

How Mac Hunter's equipment picks help him outwork the competition

The success of Mac Hunter's business depends on efficient construction equipment. Hunter currently utilizes a fleet of around 12 compact machines, including mini excavators, skid steer loaders, compact wheel loaders and four different compact track loaders.

THE MOST VERSATILE MACHINE IN THE FLEET

Of these machines, he said the JCB Teleskid is the most versatile and useful for his company's numerous projects and challenges that come with them.

The machine's telescopic boom allows the Teleskid to lift over 13 feet—8% higher than any skid steer on the market—and reach forward 8 feet—60% further its nearest competitor. It is also the only skid steer that can dig below grade, to a depth of 3 feet.

The Teleskid is available as a wheeled skid steer loader or a compact track loader, with rated operating capacities of 3,208 pounds and 3,695 pounds, respectively.

MANY MACHINES IN ONE

Hunter purchased his Teleskid from his local JCB dealer, without ever seeing it in person or operating one previously. He said he knew right away that it was the solution to his problems, and he has been extremely impressed with the Teleskid from the moment it was delivered.

When it comes to loading trucks, one of the tasks for which Hunter uses his Teleskid most often, he said there is absolutely no comparison to the equipment he used previously.

He is able to load trucks on a jobsite, in a field or wherever he happens to be, without needing to build a ramp or find a low spot to park the truck. And he's able to place the load in the center of the trailer or on the far side of the bed.



Hunter said his favorite feature of the Teleskid is the horizontal and vertical reach. While many focus on the machine's unique vertical reach capability, he said he is just as impressed with its ability to reach over objects and obstacles. The extended horizontal reach is particularly helpful while completing grappling work.

RAPID ATTACHMENT CHANGES

The number of equipment attachments that Hunter uses in his business is extensive and varied. On any given day, Hunter could need to change multiple times between a bucket, brush grapple, log grapple, concrete hopper bucket, forks, crane boom, snow plow, auger, mower and more.

As Hunter often works alone, the Teleskid's quick-hitch saves him a lot of time by allowing him to change attachments quickly, without leaving his operator's seat.

EASY TO MAINTAIN & OPERATE

For his one-man operation, simple maintenance and servicing requirements are important. Hunter says the Teleskid's single-boom design enables easy access to daily inspection points and the entire engine compartment.

Although Hunter was familiar with JCB before buying his Teleskid, it is the first JCB machine he has owned. He said he's been impressed, and will not hesitate to purchase another JCB when the need arises. JCB is truly "ahead of its time," Hunter said.

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jcb.com/teleskid



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Kobelco USA

How GBL Construction got its start with the help of industry veteran Feenaughty Machinery

Feenaughty Machinery has been supporting the construction industry in Portland, Oregon, for over 100 years. The family-owned business believes in hard work and loyalty, and has maintained its dedication to supporting customers' needs with top-notch equipment and service. So, it's no surprise that the team at Feenaughty was excited by the challenge Gary Lyon presented when he walked through its doors 3 years ago.

For many years, Lyon had been working in the construction industry for a large, local excavation contractor. He was passionate about the industry and confident he could use his skills and experience to start his own subcontracting business. Lyon visited Feenaughty a few days before signing his first contract with a predominant homebuilder as GBL Construction.

"Lyon told us about his new business venture and explained that he was in

the midst of securing his first project," said Derrick Hough, territory manager at Feenaughty. "He was seeking two excavators to start with, and had plans to grow GBL Construction from there. But with zero business history, Lyon needed a heavy equipment dealership to help him get started."

Lyon had considered the other local equipment dealers, but heard positive things about Kobelco machinery and the Feenaughty dealership. He needed a Kobelco SK85CS excavator and a SK35SR excavator to perform excavation and utility work as a residential general contractor on his first project. Feenaughty developed a rental purchase contract for Lyon so that he could get to work immediately and begin to gain equity in the machinery over time.

"I left Feenaughty that day feeling confident in my decision to partner with them," said Lyon. "After discussing needs and expectations, they provided a creative solution to help me get my new business going. The process was seamless, and once my contract with the homebuilder was solidified, I was able to get my first two Kobelco excavators on the job right away."

GBL Construction began as a small operation with few employees and one jobsite. Lyon has expanded the company since its founding in 2016, and GBL Construction is now working three to five jobsites at a time. Lyon has also purchased five more Kobelco excavators from Feenaughty to add to his fleet, including two SK45SRX models, two additional SK85CS models and a SK140SRLC-5 equipped with a dozer blade. Lyon says the Kobelco machines have been profitable investments for GBL Construction.

"Lyon genuinely cares about the work that he performs, the machinery he performs it with, and the relationships he gains along the way," said Brendan Green, general manager at Feenaughty. "GBL Construction has become another flagship customer for us in the Portland metro area. The future looks very positive for GBL Construction, and we look forward to continuously contributing to its success with our sales, parts and service teams."

Lyon said the Kobelco machines have been very productive and reliable for GBL Construction. Recently, he helped the Kobelco marketing team capture photos and videos of the excavators at work on his jobsites throughout Oregon.



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Most excavators can only do one thing at a time – travel, lift or swing. With our exclusive independent travel feature, KOBELCO excavators can do all three. Advanced hydraulic circuitry keeps the right amount of power going to the right places, so you can tackle even the most complicated



MINI

SHORT RADIUS

CONVENTIONAL

KOBELCO-USA.COM/EXCAVATORS

BUILT LIKE NO OTHER



Liberty Mutual Surety

One partner to cover construction risk from start to finish

Liberty Mutual Surety, a business unit of Liberty Mutual Insurance, is the second largest surety in the United States 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, Liberty Mutual Surety has the capacity, capability and professional team to underwrite all types and sizes of contractors and corporations.

The company works with agents and customers to build mutually profitable relationships by providing smart business solutions, ease of doing business and consistent, responsive service through knowledgeable surety professionals.

STABILITY

Liberty Mutual has been in business for more than 100 years and consistently ranks in the top 100 on the Fortune 500 list of the largest U.S. companies. The strength of Liberty Mutual provides a solid foundation for its surety operations and allows for continuous growth and development within the industry.

INTEGRITY

With more than 40 U.S. field offices, Liberty Mutual Surety's underwriters work hard to build and maintain relationships with agents and customers. Liberty Mutual Surety values each customer, big or small, and strives to maintain a status of trusted advisor through the creation of mutually profitable growth. Your success is Liberty Mutual Surety's success, and it is devoted to working with agents to bond your projects.

CAPACITY

As of July 1, 2018, Liberty Mutual Surety's combined U.S. Treasury Department



listing is in excess of \$1.7 billion, which is among the highest in the industry.

ENHANCED SERVICE OFFERINGS

Liberty Mutual Surety offers a variety of programs to benefit both agents and customers, including agent training, professional advisory services, custom, industry-related reports, bond issuance platforms and more.

Liberty Mutual Surety is continually evolving to meet the needs of its agents and customers and have teams dedicated to bringing you innovative solutions to help your construction business 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 sized 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, Liberty Mutual Surety can also provide you with comprehensive property and casualty coverage, ensuring all aspects of your projects are protected.

DEDICATED CLAIMS DEPARTMENT

Every project is started 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 that have experience in helping sort through issues. When you choose Liberty Mutual, you will work with one company to cover construction risks from start to finish

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



Better Understood. Better Prepared.



${\bf Liberty\,Mutual\,Surety\,provides\,you\,with\,the\,construction\,insights\,you\,need\,to\,succeed.}$

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

On Center Software by ConstructConnect

KHS&S gains greater flexibility with digital takeoff & estimating tools

With high construction demand and razor-thin profit margins, it has never been more critical for owners and contractors to work smarter, not harder. Bidding and winning the right work can mean using innovative and integrated technology to ensure both productivity and profitability. Whether you're a concrete contractor or a drywall construction firm owner, you are probably already using software tools for accounting, project management and/ or estimating. But are these tools fully integrated or siloed, one-off solutions? Transferring data between spreadsheets and keeping up with version control when your tools don't integrate can slow you down-not to mention create more than a few headaches.

WIN MORE PROFITABLE WORK

When it comes to streamlining construction workflows, integrated tech tools offer the benefit of creating repeatable processes so change orders don't fall through the cracks and labor and costs are bid accurately every time. Integrated workflows make it easier to keep everyone on the same page—from the field to the office.

For example, On Center Software customer KHS&S, a specialty walls and ceilings contractor, has discovered greater flexibility with digital takeoff and estimating tools. Changes are a snap during the preconstruction and design phase. Using On-Screen Takeoff and Quick Bid, the company can swiftly answer a general contractor's questions about any job and verify bids.

Because the team can customize and save assemblies in libraries for future projects, KHS&S can handle any last-minute changes or requests. With On-Screen Takeoff, it can use the click and drag of a mouse to view electronic



plans, takeoff multiple quantities, spot revisions, create requests for information and more.

AVOID BIDDING TOO LOW OR TOO HIGH

Starting a new project bid or budget is much easier when a construction business can create databases where all material pricing, production rates and more are stored—rather than searching through spreadsheets. For example, KHS&S uses this feature to create and store entire assemblies. Since much of what it does is very repetitive, the team can pull this information with just the click of a button. Specifically, KHS&S uses Quick Bid's eQuotes feature for current pricing of suppliers and vendors and for generating change orders that can be priced independently or included as part of the entire job. Automatic calculations also mean greater accuracy and less time calculating results.

SAVE TIME & MONEY WITH INTEGRATED TOOLS

Are you hungry for speed, accuracy and efficiency? Stop putting your business at risk with software and workflows that don't integrate. On Center Software by ConstructConnect has been focused on helping estimators for 3 decades. The Contractor's Suite is a powerful, integrated, end-to-end estimating solution that has helped thousands of contractors boost their efficiency and increase profits every day. Don't wait to explore the benefits of these integrated tools. Request a free Contractor's Suite demo and experience the benefits of these money-saving tools today.

On Center Software by ConstructConnect 866-386-5177 oncenter.com



DON'T GET BURNED BY BAD DATA

It can be overwhelming—the amount of paper, post-it notes, and emails passed back and forth before and during bid day. Trying to manually adapt to these changes can feel like you're bringing a wooden stick to a

Slay the source of unintended data errors by standardizing your database. With Quick Bid, you'll have one location to swiftly price, assemble, summarize, revise, and submit a detailed final bid.

You'll also import data 10 times faster when you seamlessly integrate with On-Screen Takeoff. Stop clawing and fighting your way through a forest of marked-up paper drawings—use Quick Bid and On-Screen Takeoff to increase your profit margins and cut your estimating time in half.

Vanquish Your Estimating Errors Now!

Get Free Demo – oncenter.com/forms/quick-bid-demo-request



Payroll4Construction.com

Certified Coatings Co. conquers extreme heights & complex payroll processing

DESPERATELY SEEKING SERVICE (FOR MULTIRATE PAYROLL PROCESSING)

"We're all construction with multistate and union, so it's a complex payroll," said Tammy Evans, chief financial officer of industrial painter Certified Coatings Co., a Fairfield, California, division of Germanybased The Muehlhan Group.

Evans explained just how complicated it can get on one of the company's jobs. "One of our local collective bargaining agreements was that guys working at 50 feet, 100 feet or 150 feet would get paid different rates for the height they were working at and how long they were working at it," Evans said. Evans often had to cut several checks a week for each employee because of all of these different variables. With its multiple rate, state and union setup, Certified Coatings was looking for a service that could process a payroll that complex. Evans said, "Payroll4Construction.com (P4C) was the only company we have found that's been able to do that."

'WE BLEW UP THE SYSTEM ...'

Prior to using P4C's construction-specific payroll service, Certified Coatings attempted to use another payroll processor. But after nearly 9 months of planning and setup, it still hadn't been able to complete a payroll. "We blew up their system because our payroll was too complicated," Evans said. Eventually, Certified Coatings decided a change needed to be made. A payroll service that couldn't handle the intricacies of the construction industry simply wasn't going to cut it.

'IT DELIVERED WHAT WAS PROMISED'

Evans took to the internet, looking for a construction payroll service advanced



enough to handle her payroll needs. This is where she initially came across FOUNDATION, the powerful construction accounting software that P4C uses to process payroll.

Evans set up a call and was immediately surprised with the capability of P4C. "The difference with the P4C sales staff is that they delivered what they promised. I'm always concerned that a sales team is overselling me," Evans said. "But with P4C, we could do demos, and we saw that everything was just like they said." From there, the rest was easy. "We made a decision at the end of August, and were converted, live and running by October 1," Evans said.

Besides easily processing all of her complex payroll situations, Evans continues to be impressed with the many other benefits P4C offers her and the team at Certified Coatings. "We do certified payroll every week for

every project. A lot of times, you'll have to get these types of reports created or programmed, but with P4C, the certified payroll reports were already there. In a click of a button, you have your information, and you can do both electronic and print," Evans said.

By focusing exclusively on the needs of the construction industry, P4C is more than just a payroll service—it's a construction service that gives clients like Evans and Certified Coatings the tools they need to succeed.

Ready to see how the No.1 payroll service for contractors can help your business? Get a free quote at Payroll4Construction.com.

Payroll4Construction.com 800-949-9620 info@payroll4construction.com payroll4construction.com





The #1 Payroll Service for Contractors. | (800) 949-9620



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Circle 115 on card.

Viewpoint Construction Software

Interstate Electrical Services Corp. simplifies the complex world of construction

Interstate Electrical, a full-service electrical contractor with over 600 employees, needed a solution that the whole organization could use to streamline processes. In the end, the company saved thousands of hours in data processing time, while increasing productivity and quality of work. Steven Drouin, director of IT services at Interstate Electrical Services Corp., noted that the mix of disconnected software programs Interstate was using was almost 12 years old and was no longer meeting the company's needs.

"Just a simple thing like a jobsite address was being entered into six different applications back in the day," he said. "We were operating under tight time constraints and budgets—just like every other contractor out there. We needed to streamline our processes and coordinate better—both internally and externally." That led to a search for a software solution more focused on construction and accounting.

Interstate Electrical implemented construction software that doesn't require specialized technical knowledge, yet provides real-time data—all via a native integration between an enterprise resource planning system and a webbased, project collaboration platform.

"There were always additional levels of repetitive data entry," said Drouin. "[Now, we] can see when something is going south, and address before it becomes a long-term issue."

The ability to view and interpret data in real-time reduces errors, rework and cost, yet increases quick decision making and productivity. This is key to keeping up and meeting the challenges of a growing construction organization.

"The [project managers] know where their costs are coming in, labor, materials hitting the jobsite—everything they need,



always up to date," said Drouin. Selfservice dashboards and reports are used so everyone from project managers to payroll clerks get an easy, secure view of the information they need to do their jobs quickly and efficiently.

Now, Interstate can find what it needs, when it needs it. Reports include a list of top clients, work status, billings, work in progress and labor. All documentation, including quotes and drawings, are stored in one, manageable solution. The company saves time normally used to find documents, while reducing confusion and errors.

ONE SOLUTION, UNDER ONE UMBRELLA

Viewpoint offers a flexible suite of software solutions, all housed in one place to connect various project teams inside and outside a construction organization. Engineers, architects, accountants and project managers have access to materials, drawings and status updates, while the field can manage submittals, RFIs and daily logs.

DRIVING TEAMWORK & COLLABORATION BY IMPROVING VISIBILITY INTO DATA

Interstate is also using Viewpoint solutions to further connect the back office and field. "Gone are the days of using Excel templates and PDF forms that are outdated as soon as you create them. Everyone is using the same thing across the company." Drouin said.

THE RIGHT CONSTRUCTION SOFTWARE PARTNER FOR YOUR SPECIFIC NEEDS

From accounting to project management to field productivity, Viewpoint construction software provides one modern solution for your intricate construction organization. Visit info.viewpoint.com/CBO_viewpointone. html to see the software in action.

Viewpoint Construction Software 971-255-4800 viewpoint.com



ViewpointOne brings together the industry's best finance and HR applications with fully integrated project management and mobile field tools to connect all the parts of your business.

VIEWPOINT.com/ViewpointOne

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ClearSpan Fabric Structures

Story Construction solves storage problems faced by city managers

The city of Marshalltown, lowa, recently hired Story Construction to find an alternative solution for the city's equipment storage needs. The city was renting multiple buildings in the area, so equipment was hard to locate and difficult to manage. The city wanted a building that would serve as one centralized location to keep all of its equipment together and provide a more cost-effective solution for its needs.

"They needed an economical structure that would also provide the large amount of space required. They decided to purchase two Hercules Truss Arch Buildings from ClearSpan," said Martin Miille of Story Construction.

The high clearances of the structures make them an ideal solution for this application. "The large amount of headroom allows big equipment to maneuver inside or simply be stored there." Miille said.

The city had to research various types of buildings in order to be approved for the project. After considering traditional wood and steel structures, it was clear that ClearSpan was the best option. "It's a concern when a company tries to get away with providing the minimum requirements to get the job done. ClearSpan was different, so the decision to choose them was easy," Miille said.



Praising the city's choice of suppliers, Miille said, "ClearSpan has a better product and a better value, so the city got the best of both worlds."

ClearSpan Fabric Structures 866-643-1010 npulyado@esapco.com clearspan.com



Circle 106 on card.

Contractor WorkZone by Trimble

How O'Neill Construction bridges the technology gap

When it comes to jobsite productivity, O'Neill Construction uses technology as an accelerator for its success. John O'Neill. owner of O'Neill Construction, considers himself "old school" when it comes to managing a construction business. That is, until he came across Trimble's Contractor WorkZone, an easy-to-use project management app.

For O'Neill, running his business in a simple and accurate manner is most important. "What Contractor WorkZone brings is a simple, easy system into a different form of record," said O'Neill. "I now use the app's template, which is a proactive prompt for what I need to keep my finger on running my business."

On a daily basis, O'Neill Construction manages the crew, suppliers and subcontractors, and it's crucial for the success of the business to have a clear and concise line of communication. For O'Neill, the timekeeping feature of Contractor WorkZone is what helps keep things organized.

"The Site Diary is the most important document, and should be used as a proactive tool that prompts the site foreman to think ahead about what has to be done next and what supplies are needed. It also requires daily events to be recorded on site." he said.

For most construction managers, time equals money. For O'Neill Construction,



technology like Trimble's Contractor WorkZone was the key to bridging that gap.

Contractor WorkZone by Trimble 877-300-2904 info@contractorworkzone.com contractorworkzone.com





Circle 138 on card.

eMars Inc.

Taking the headache out of project compliance

"We've saved money and time—probably about 80 percent of both. eMars software is easy to install and use. I love that the tedious, labor-intensive calculations, which confirm that paid amounts are accurate, are a thing of the past. No more having to crack out fringe benefit statements on the calculator. What used to take hours can now be done in a fraction of the time. And if there is a question. I have found the eMars team to be responsive and helpful. As a general contractor using this system, it allows me to view all of my subcontractors to make sure they are up to date and are paying the wage determination that was assigned to the project. Every day,

I take a look to see what I might need to address with the subcontractors. If I were trying to do this with paper copies, it would take all day long. We are now able to automatically upload payroll into the system, so there is no longer a need to manually enter payroll into a certified payroll system. eMars' system is simple to review; makes compliance an attainable goal for all subcontractors; and allows for ease of reporting to owners. eMars will also work with subcontractors to help them automate their payroll entry."

 General contractor and eMars customer



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



Circle 112 on card.

Minnich Manufacturing

Smith Paving & Excavating Inc. helps revitalize NHRA racetrack

Summit Motorsports Park in Norwalk, Ohio, is home to the annual Summit Racing Equipment National Hot Rod Association (NHRA) Nationals.

Miller Brothers Construction of Archbold, Ohio, was recently hired to complete a \$1.6 million, quarter-mile track reconstruction of the asphalt racetrack. Norwalk's Smith Paving & Excavating Inc. was hired to work on the project as a concrete subcontractor.

In the racing world, concrete tracks improve drainage, aesthetics and speed. To create the all-concrete track and comply with the Occupational Safety and Health Administration's (OSHA) final rule for silica dust, Smith Paving & Excavating required equipment that

offered outstanding productivity and safety features.

The contractor used a GOMACO paver that required the use of 16 HV-2 Series vibrators from Minnich Manufacturing, an industry leader in dowel pin drills, concrete vibrators and vibrator monitoring systems.

"The HV-2 series vibrators are very consistent from unit to unit," said Derek Dilger, vice president of Smith Paving & Excavating Inc. "They give us consistent compaction throughout the pour, which is very important in a project like this."

Minnich A-1 Series on-grade dowel pin drills and an A-1 UTL utility drill were also used. The Minnich dust collection system was added to each drill to comply with



OSHA silica dust requirements.

According to Dilger, Minnich
equipment helped expedite the
reconstruction process. "We've been
working with Minnich for nearly 40 years,
and without them, we don't pave, Slip,

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

curb or gutter," Dilger said.

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.





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

Circle 129 on card.

PATLive 24/7 Answering Service

Fence Direct finds standout customer service without sacrificing valuable time

Fence Direct is a leading fencing company in central Florida. They provide the highest quality products and installation services. Because Fence Direct assists its customers throughout the entire process—from estimate to installation—it is important that its clients are able to reach their advisors at any time to answer their questions. However, with requesting permits for every customer, assessing each property and installing the fence properly and quickly, the Fence Direct advisors are not always readily accessible.

Fence Direct now uses PATLive as an overflow call center during

high-call-volume times to ensure that every customer is spoken with and any general questions are answered.

PATLive also clarifies whether the customer is interested in a phone or in-home estimate to provide the representative notice for the particular client's needs.

With PATLive's services, Fence Direct is able to respond to each inquiry on its own time, and with PATLive's receptionists, the team is able to dedicate its time equally between phone and in-home estimates.

With PATLive's personable and intelligent receptionists, Fence Direct can



keep its promise of standout customer service for its clients, without sacrificing time on the job.

"We're based in Florida, so being outside is a huge part of our life. With PATLive, I can beautify my community and provide safe options to their families, all while providing superior customer service," said Dany Rodriguez, lead contractor for Fence Direct.

PATLive 24/7 Answering Service 800-331-8575 hello@patlive.com patlive.com

24/7 Call Answering Service for Contractors

You Run Your Business.

We'll Answer Your Calls.





- After-Hours Call Answering
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- All US-Based Receptionists
- No Contracts



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Circle 131 on card.

Stellar Industries Inc.

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

The Stellar TMAX Aluminum is the latest evolutionary design in the TMAX Series of service bodies from Stellar Industries Inc. With a market demand for lighter solutions that combat corrosion, these aluminum bodies are 780 to 1,440 pounds lighter than their steel counterparts, while still incorporating the proven 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.

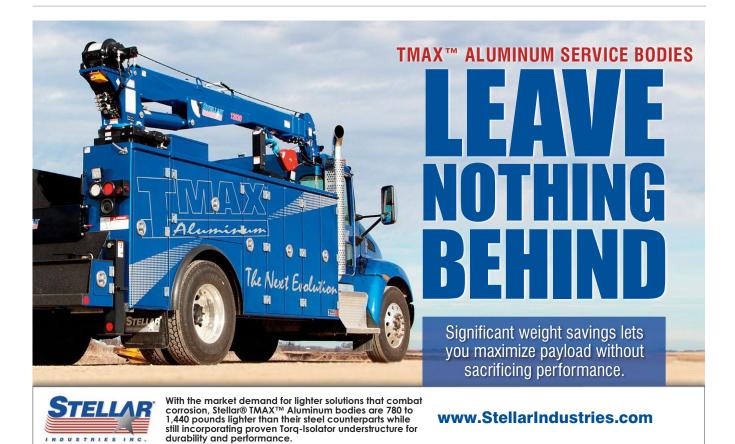
The bodies also come with many of the same standard features as the steel counterparts. This includes billet-style stainless steel hinges, three-point compression locks, double-panel doors, and double-spring, overcenter door closures.

"Stellar Industries 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 Inc. "We made sure we tested this service body in real-world situations



taken to the extreme. We want to prove to the customer that we have built a fantastic product."

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



Circle 136 on card.

The Contractors Plan by Fringe Benefit Group

J. Feldkamp Design Build sees significant savings on payroll taxes & improved bidding

The Contractors Plan by Fringe Benefit Group understands the unique challenges that Davis-Bacon and Service Contract Act contractors face when creating and managing a bona fide employee benefits plan.

Fringe Benefit Group helps companies bidding on and performing prevailing wage work realize dramatic savings on their payroll expenses by allocating some or all of the required fringe benefit portion of the prevailing wage to bona fide benefit plans. This may include retirement plans and/or health, dental, vision and life insurance. Cincinnati, Ohio-based J. Feldkamp Design Build

(JFDB) provides heating, ventilation, air conditioning and refrigeration, mechanical and custom design-build services for large commercial projects. In 2018, the company began using The Contractors Plan as its prevailing wage benefit plan.

"Choosing The Contractors Plan has been a win-win situation for our company and its employees. JFDB has seen a huge savings on payroll taxes, which we can use to improve our bidding and/or reward our employees. The company is saving money, and our employees are putting money toward their retirement and future," said JFDB Office Manager Jeanne



Stockton. "The Contractors Plan team provides enormous value with minimal fees. The team walked us through exactly what to do—from implementation to assisting our employees as they access their accounts. If your company does a significant amount of prevailing wage work, it makes a lot of sense to work with The Contractors Plan."

The Contractors Plan by Fringe Benefit Group 800-328-1519 info@thecontractorsplan.com thecontractorsplan.com



Thunder Creek Equipment

How Soil Designs Inc. keeps upscale California residential projects moving

Soil Designs Inc. is a fourth-generation, family-owned contractor that develops custom pads for luxury homes in southern California. A fleet of nearly three-dozen machines requires a deliberate approach to fueling and service. Over the years, Soil Designs used a 100-gallon tank in the back of a pickup truck, which required multiple refueling trips throughout the day and night. Eventually, the downtime, operating costs and multiple trips to the gas station became a hurdle that Duane Hale wanted to improve.

Soil Designs turned to Thunder Creek Equipment's Multi-Tank Trailers (MTT). The MTT features individual, 115-gallon tanks connected to a manifold system that completely segregate each tank during transport, which mitigates the need for a HAZMAT endorsement and, in most cases, a commercial driver's license (local regulations may apply).

"The main thing about this is mobilization," said Hale. "You can bring it anywhere; you can drop it at a jobsite; you can have your fuel supplier come fill it up; or you can legally bring it to a fuel supplier and get fuel and diesel exhaust fluid in it. Anyone in the company can hook up to this [trailer] and go down the highway when we need to take it to another jobsite. It gives us the

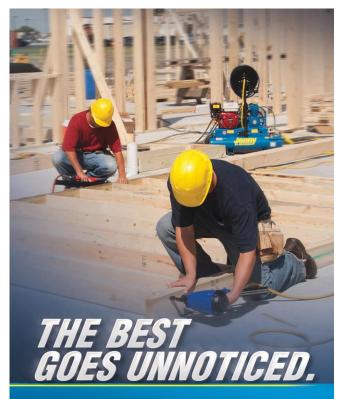


flexibility that way—not one person has to have a specific license and we're able to mobilize it more quickly and easily."

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



Circle 137 on card.



JENNY. HIDDEN IN PLAIN SIGHT SINCE 1927.

The only time people notice an air compressor is when it's not working. That's why Jenny has basically gone unnoticed since 1927. It's the hazard of offering the most reliable compressors on the market, but we wouldn't have it any other way...nor would our customers.

» Isn't it time a Jenny was hiding on your jobsite?





JennyProductsInc.com

Jenny Products Inc.

Exceeding safety standards with compressor technology



Modern machining processes have played a crucial role in improving air compressor pump longevity and performance. A pump's cylinder wall can now be machined to achieve bore tolerances that were previously considered unachievable. Specially designed rod inserts on the connecting rod-crankshaft interface help prevent damage to the pump's components. Rugged, oversize crankshaft bearings further maximize durability.

Today's leading compressors are also equipped with features to simplify maintenance, such as oil gauges, belt guards and unloading valves. Oil sight glasses allow contractors to check pump oil levels in seconds. Easy-access unloader pins can be lubricated or replaced in under 10 minutes, whereas traditional pin replacement could take well over an hour.

Jenny's full line of electric motor piston air compressors have a "UL Listed" designation from Underwriter Laboratories (UL). This means they have been tested and determined to meet UL's strict requirements, which are based primarily on its published and nationally recognized Standards for Safety. The approval lifts Jenny compressors to a safety standard not found with most compressor manufacturers.

In recent years, the portable air compressor market has been shrinking. Now more than ever, customers need to do their research. Look for companies that continue to innovate, as they are typically the ones that are in it for the long haul.

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

Mi-T-M Corporation

Brandco Inc.'s crew powers 8 nail guns with one compressor



The powerful Mi-T-M Rotary Screw Portable Air Compressor is ideal for large construction sites, concrete contractor work, parking lot maintenance, highway construction and repair and any job where maximum air power is a must.

Built for optimum performance and endurance, the singlestage gasoline rotary screw features a banded 4 V-belt drive system and high oil temperature shutdown. The powerful 999cc Kohler OHV engine with a 1 and 7/16-inch crankshaft and integrated pump combination can produce 115 CFM at 100 PSI.

The air compressor's powder-coated steel frame with roll cage, lifting hook, winch point, tie-down anchors and 15-inch pneumatic tires for effortless transport. It is great for multistory building construction, where relocating a tow-behind compressor to a second level is nearly impossible.

Built to handle the most demanding conditions, this durable machine stood up to harsh winter weather when used by Brandco Inc.'s building crew. "It performed beyond our expectations. We used eight framing nail guns at once and still had extra power," said Frank Gadek, a project coordinator for Brandco Inc. "It was very easy to move around our construction sites, and we found it was the only air compressor needed on-site for 20 carpenters."

The Mi-T-M Corporation manufactures industrial equipment at its one-million-square-foot facility located in Peosta, Iowa.

Mi-T-M Corporation 800-553-9053 kanders@mitm.com mitm.com



At Mi-T-M, we pride ourselves on building mighty, damn good equipment. It's what sets us apart from our competition. Our industrial line is built to withstand demanding work conditions. When you purchase equipment with the Mi-T-M name on it, you are buying dependable equipment that is designed, built, and tested by good people. Mighty, Damn, Good.

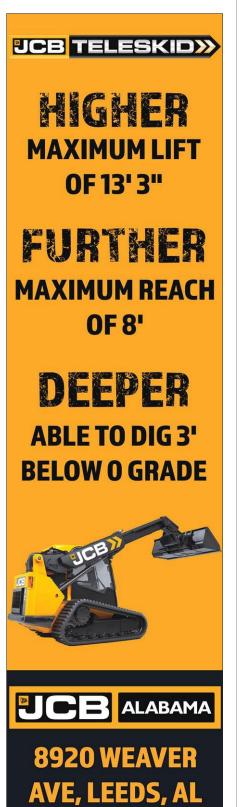
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Circle 128 on card.



Southland Machinery

Stone & Sons Electrical Contractors & the compact machine that does the work of its full-size counterpart

When Stone & Sons **Electrical Contractors** won a bid to work on the Interstate 20/59 Bridge project in downtown Birmingham, Alabama, company owner Danny Stone knew the team needed a compact machine that could do the work of a full-size one. Enter the JCB Teleskid.



"The project has

narrow corridors that needed a long reach and the ability to turn on a dime in between precast poured concrete highway sections in rows," Stone said. "Our contract work is for LED lighting, and we had to have the perfect machine to maneuver around to accomplish our work."

When Project Manager Marcus Henderson suggested the JCB Teleskid as the solution, the team checked out some videos of the machine online and immediately contacted JCB of Alabama.

"The JCB of Alabama representative had already been calling on us, and we were familiar with them. Our team quickly contacted him. We made the deal, put a Teleskid on the jobsite, and the team absolutely loves it. It fit the bill perfectly," Stone said

It was the versatility of the Teleskid that caught Stone's attention, but it was the innovative single-power boom design that sealed the deal.

"They really sold me on the single-power boom design, because of the amount of steel in it and the strength of it, which is completely uncompromised compared to the dual boom. The lifetime warranty on the boom was also certainly a big selling point and helped give us confidence," Stone said.

The Teleskid's single-power boom makes it one of the safest machines on the market, thanks to improved visibility and side-door entry.

"Ergonomically, the machine is very sound," Stone said. "When we first took delivery of the machine, we received a comprehensive orientation of the service points and intervals and total overall upkeep. JCB's Live Link Lite machine monitoring and service alerts, the online program that allows the dealer to assist in machine service, will also be of tremendous value."

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American Time and Labor Company

HR pros opt for native apps to meet mobile workforce management needs

When it comes to managing your workforce, it's important to find a mobile app that, when the data is collected by employees, it will reside in the handset or is "native," rather than being a browser-based product. Browser-based products are not as reliable as a native app, because if a data connection is lost between phones and tablets and/or desktop computers due to poor coverage or an outage, a lot of the data could be lost. In contrast, a native product will continue to collect data and push the data forward when coverage is once again in reach. Additionally, with a native product, the application is always available, and data is less likely to get lost. Native applications are more reliable and offer better GPS data as well.

Find a mobile application that can provide more services that enhance your business and move it forward. If you do this, the

financial burden of paying for an app could actually turn a negative into a positive, due to the additional features and functionality that make your business processes easier and more cost efficient. Documentation is what keeps employers compliant. When comparing apps, make sure the software addresses:

- · GPS tracking
- Geofencina
- · Time and attendance
- · Meal and rest break management
- · Mileage and expense tracking
- Electronic documentation and custom forms
- · Team or crew clock in/out
- · Premium pay capabilities
- · Digital signature signoff

The author of the advice listed above, Anna Savini with PHR, has only found one mobile app so far equipped with all of these features—Pacific Timecard offered by American Time and Labor Company.

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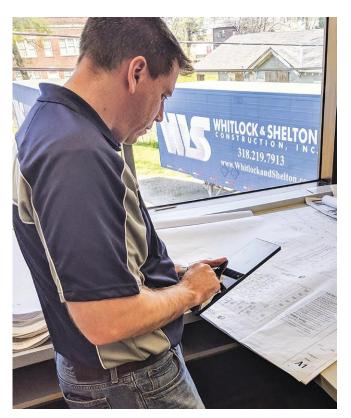
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Corecon Technologies Inc.

How Whitlock & Shelton embraces innovation & technology to provide higher-quality work

A premier construction and design-build company based in Shreveport, Louisiana, Whitlock & Shelton's portfolio boasts myriad public and private spaces, including education, retail, industrial, churches and federal and municipal facilities. Known for providing a high-quality construction experience, while embracing the latest innovations and technologies, the firm uses various technological advancements to streamline operations and deliver value to the clients.

Using technology that brings people together is an ideology Whitlock & Shelton follows when choosing construction tech tools. The firm chose Corecon construction management software because of its collaborative nature.

"Corecon is a one-stop shop for our construction management services, and it does so at an affordable price," said David Pratt, Whitlock & Shelton senior project manager and chief estimator. "In addition to project management, we

use it for bid coordination and financial and accounting needs. The accounting integration platform allows us to sync with QuickBooks and easily track our projects financially. It also stores subcontractor and vendor contacts, plans and specifications, contracts, change orders and photos, while easily monitoring who is seeing and responding to our bid invitations."

A key industry challenge Pratt said Corecon addresses is documentation. "Corecon allows us to enter and search for specific data easily," he said. "Since it is cloud based, Corecon eliminates the lag time between field staff entering information and office staff receiving it. The distribution and storage of information is streamlined, proficient and user friendly."

"We have gone all in with Corecon and couldn't imagine our day-to-day operations running as smoothly without it." Pratt said.

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InSite Software Inc.

How Orange Crush LLC cuts hours & increases productivity

Illinois-based Orange Crush LLC cuts countless hours from its earthwork takeoffs using InSite SiteWork to perform onscreen PDF & CAD takeoffs. Vector selection saves the company more than half the time as its previous digitizer system. As a company that values customer satisfaction, Orange Crush said the best features of InSite are the knowledgeable technical support staff and online webinar training classes.



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National Construction Rentals

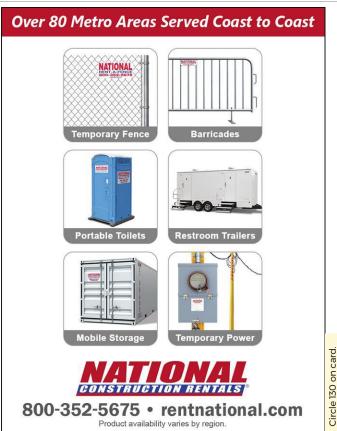
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How Wayne Davis Excavating-Trucking elevates its daily productivity

Illinois-based Wayne Davis Excavating-Trucking has been a customer of Worksaver Inc. for over 30 years. It has bought multiple attachments to help its residential and commercial customers with grading applications, general excavation, sewers and septic tanks. The company's Worksaver Inc. attachments include the SSGB-8B skid steer grader, SARG-84 sweep action rock grapple and power landscape rake, all of which allow Wayne Davis Excavating-Trucking to elevate its productivity.



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Studying the Shift to Tier 4 Compliance

The tech, fluids & maintenance required for achieving better air quality

BY AARON KLEINGARTNER

ithout question, the journey to achieve Tier 4 emission requirements in nonroad machines—specifically crawler excavators, wheel loaders and articulated dump trucks (ADTs)—wasn't an easy one. In fact, it presented some significant challenges for equipment manufacturers to incorporate these new strategies and raised concerns about how the emission standards would impact business owners.

Today, many of these challenges have become opportunities. The development of more efficient technologies has promoted improved machine performance, better fuel economy and longer engine life—all benefits to your construction business.

With a better understanding of Tier 4 diesel engine technologies, maintenance intervals and fuel management, you can become more knowledgeable about today's emission standards and their impact on your equipment.

ADVANCED TECHNOLOGIES

Today, most nonroad construction equipment is Tier 4 compliant, as the machines have undergone testing on five different United States Environmental Protection Agency (EPA) emission tiers (Tiers 1 through 3, interim Tier 4 and then Tier 4), helping to lower harmful exhaust emissions and promote cleaner air.



To meet strict EPA emission standards, multiple technologies—ranging from mechanical fuel-injection systems to electronic injection systems—are incorporated in various tier levels.

Advanced technologies, such as electronic control units, high-pressure common rail systems, diesel-oxidation catalysts and diesel-particulate filters, have been added to help reduce particulate matter, thus leading to cleaner exhaust.

Many Tier 4 machines have an additional

system called selective catalytic reduction (SCR). SCR uses an ammonia- and water-based liquid called diesel exhaust fluid (DEF). Combining exhaust with DEF causes a chemical reaction that converts nitrogen oxide into harmless nitrogen and water vapor.

DIESEL EXHAUST FLUID

To help meet Tier 4 emission standards, many heavy-equipment manufacturers use DEF—a colorless, nonhazardous chemical-in most engines that have 75 or higher horsepower. The aqueous solution consists of 67.5% deionized water and 32.5% pure urea and is susceptible to variations in temperature.

If you store bulk DEF, keep the fluid in an airtight container that is out of direct sunlight, ideally between 12 degrees and 86 degrees Fahrenheit. When the fluid is exposed to heat and direct sunlight, its shelf life may be shortened.

DEF can also freeze inside tanks, so it's best to keep the fluid above its freeze point of 12 degrees Fahrenheit. To thaw DEF tanks, engine coolant is used to heat the tank, allowing operation of the machine in subfreezing temperatures.

To help reduce contaminants, like dirt and dust, that are often introduced during fueling, fill the DEF tank directly from the DEF container with a funnel. When using a funnel or intermediate containers, keep the containers clean and use them strictly for DEF.

Contamination can damage the catalyst in your SCR system and cause you to use more DEF than you need. Purity and concentration are critical, so work with your local dealer to better understand how to store and handle DEF.

Every 6 months, you or a professional diesel fuel cleaning and inspection service should test your diesel fuel supply tanks for contaminants. To help monitor your supply tank, maintain a preventive maintenance log that includes maintenance history, filter changes and particle counts.

FUEL MANAGEMENT REQUIREMENTS

Improvements to Tier 4 engines help burn fuel in a cleaner manner and reduce harmful emissions. However, it's important to learn how to best adjust to this significant fuel-chemistry change (especially in relation to how water acts in the fuel) during each season and in all temperatures. Water can be introduced

into fuel as early as the refinery stage and can continue to be present through the terminal, distributor and pump stages.

During extremely cold weather conditions, water molecules can detach from diesel molecules. Since they are heavier than diesel molecules, they tend to settle at the bottom of diesel fuel tanks in machine and bulk-storage tanks, which can cause potential equipment engine problems and lead to bacteria growth within the tanks.

Today's lower sulfur amounts in diesel fuel, aiding in reducing harmful sulfur oxides, can lead to what is called "cold saturated fuel," which increases the tendency of fuel to gel and plug, or block, the fuel filter during cold weather conditions. To identify minor issues before they become major repairs, follow these fuel best practices:

- Test bulk fuel tanks every 6 months.
- 2. Keep supply tank fuel filters clean.
- 3. Fill machine tanks at the end of each workday.
- 4. Use 2-micron fuel filters.
- 5. Prepare for cold weather and remove trapped water from your machine's fuel filter daily.
- 6. Attend a fuel-management clinic.
- 7. Ask a fuel supplier to confirm the fuel's cloud point.
- 8. Identify the market's high-quality fuel suppliers.

Matt Quinnell of Advanced Wall Structures in Prior Lake, Minnesota, says he uses fuel filters on his company's transfer tanks to ensure the fuel is clean before it goes in his excavators. The company uses crawler excavators with hydraulic rotating grapples to build boulder retaining walls.

In addition to clean fuel, Quinnell says his company keeps a readily available supply of DEF on hand. As the company's construction fleet has grown, he has considered buying a bulk trailer to keep more diesel fuel and DEF on-site.

Although they're convenient to have on-site, it's critical to keep the tanks clean to avoid any issues with Tier 4 engines and aftertreatment systems.

PROACTIVE MAINTENANCE

When it comes to maintaining Tier 4-compliant machines, always follow the manufacturer's operation and maintenance manual. Staying on a routine maintenance schedule for engine oil and filters, and hydraulic filter changes, helps promote your machine's long-term durability.

Although most equipment maintenance schedules have not changed in the move to Tier 4, recommended oils have changed to CJ4 engine oils. These fluids are designed to work properly with aftertreatment systems while maintaining expected engine performance under proper service intervals.

Additionally, a non-diesel particulate filter (DPF) engine eliminates the regeneration process required to clean the accumulated soot from the filter. Since your machine doesn't have to burn extra fuel to heat up the filter during the regeneration process, you can continue operating without parking the machine for forced regeneration.

By understanding the technologies needed to make the shift to Tier 4 emission standards, the required maintenance, and how to properly store and handle DEF, you can better make the necessary changes to your diesel engines and perform the required maintenance procedures that accompany these technologies, allowing you to meet higher air quality standards. CBO

Aaron Kleingartner is the marketing manager for Doosan Infracore North America LLC, headquartered in Suwanee, Georgia. Kleingartner has 17 years of product development, analytics and strategic marketing experience with Doosan. Visit doosanequipment.com.

So So DEF

How Soil Designs uses fuel transportation solutions to maximize efficiency

BY LUKE VAN WYK

n recent years, the increase in sophistication of bulk fuel transportation solutions has played an important role in the bottom-line success of construction firms of all sizes across the country.

New fuel-trailer designs, the addition of diesel exhaust fluid (DEF) management capabilities and a plethora of customizable features can culminate in fleets that serve as do-it-all workhorses, helping maximize uptime and efficiency on the jobsite.

NAVIGATING THE DRIVER MARKET

According to some industry estimates, the United States is short on professional drivers (roughly 60,000)—a number expected to double over the next decade. That pressure is being felt across the entire transportation and logistics network, including the construction industry. In many high-competition markets, companies have reported issues recruiting, hiring and retaining drivers who are both reliable and consistent.

Noting this trend, fuel transportation solution providers have adapted. Today, there are fuel-trailer solutions that meet and exceed regulations for the Department of Transportation and other federal regulators. This new adaptation allows construction companies to deliver between 460 and 920 gallons of fuel—and another 100 gallons of DEF—to their



jobsites without ever having to employ a driver who has a commercial driver's license (CDL) or a hazardous materials (HAZMAT) endorsement.

SAVING TIME & MONEY

Whether operators are running one large jobsite or multiple small sites, the addition of a bulk-fuel transportation solution to your fleet can give you more flexibility and control over your input costs and tracking outputs from site to site, or even machine to machine. For example, if industry indicators suggest fuel prices are going to experience a surge, construction

company owners and fleet managers can beat that rush in the near term with a bulk-fuel storage and transportation solution, allowing them to save on costs. This solution also helps companies save on fuel delivery services, as well as the corresponding fees and premiums they're paying for that fuel.

Further, some fuel transportation solution providers allow for the addition of motor-powered pumps that can pump as many as 40 gallons of fuel in just 60 seconds—yet one more way fleet managers are able to cut down on time and maximize efficiencies.

FINDING THE RIGHT PACKAGE

There are a variety of bulk-fuel solutions that fit virtually any fleet and fuel volume. From nimble combinations that package diesel and DEF in a transportation tank that fits in the back of a pickup truck, to fully customizable multitank trailers and medium-duty truck bodies outfitted with custom fuel storage and maintenance equipment, there are fuel transportation options on the market that can save you time and money.

According to some industry estimates, depending on the amount of fuel being used in a given day, some operators experience a return on investment (ROI) in their bulk-fuel transportation solution in as little as 90 days.

This fuel-trailer ROI has been fully realized by the team at Soil Designs, a fourth-generation, family-owned contractor in southern California that specializes in precision grading services for luxury homes ranging from \$5 million to \$100 million.

For years, Soil Designs used a 100-gallon tank truck that required multiple refueling trips throughout the day and night. With up to eight jobsites operating simultaneously, Soil Designs owner, Duane Hale, whose grandfather and great grandfather started the company in the 1950s, needed to find a sustainable solution to the downtime, operating costs and frenetic nature of their fueling operation.

So, Soil Designs turned to a leading manufacturer's fuel trailers, which don't require a CDL or HAZMAT endorsement to operate because of the way their tanks are designed and connected through a common manifold. The addition to Hale's fleet made a near immediate impact.

"When you look at your owning and operating costs and how much equipment and engines cost today, including keeping everything clean, I think you have to really take a look at mobility," Hale said.

"Time is money, and it's all about getting your equipment easily from jobsite to jobsite. That's the name of the game in our industry."

For growing construction operations like Soil Designs, the mere presence of a fuel trailer onsite, Hale said, instantly lends his company credibility with his customers.

"We're already thinking about getting another one," Hale said. "They're nice to have on a jobsite, and they show what kind of a contractor you are just by having it there."

ENVISIONING THE FUTURE WITH DEF

Managing DEF is the new reality for most in the construction world. However, when looking at the effectiveness and longevity of equipment running on Tier 4 engines with selective catalytic reduction (SCR) technology, it is paramount that the DEF being used to service those systems is handled in a way that ensures purity and quality.

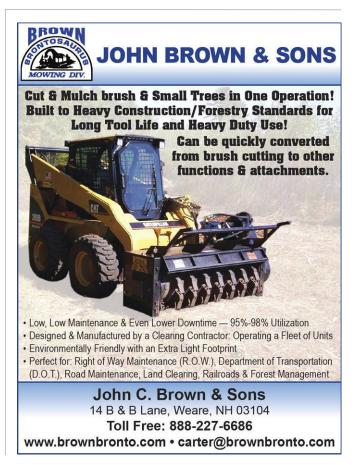
AMB International, a manufacturer of DEF, estimates that 70% of all SCR system failures can be attributed to poor DEF handling. In many cases, that means distributing DEF in an open environment that is prone to dust and particle contamination, which can cause engine de-rating and damaged equipment and may even void the manufacturer's warranty.

Some bulk diesel transportation options offer the addition of DEF systems that intake and dispense DEF in a closed-system environment. That means the tank on the fuel trailer or truck connects directly to your DEF tote or container, intakes the DEF until the trailer tank is full, and then, that same connection is reconnected to a pump handle for seamless dispensing into your equipment. This process alleviates the risk of contamination and protects your equipment investment. CBO



Luke Van Wyk is the vice president of sales for Thunder Creek Equipment, a manufacturer of fuel transportation solutions for industries utilizing heavy equipment. Visit thundercreek.com.





A Slippery Slope

9 tips for working safely on an incline

BY MATT HENDRY

orking on slopes can be a dangerous activity for excavator operators, as well as the machine itself, which is why it's important for operators to always take extra care when working on an incline. The following are nine tips to help ensure the safety of your employees and machines on your next sloped project.

1. PAY CLOSE ATTENTION

Construction work involving machinery requires the operator's utmost attention. And working on a slope requires more attention than working on flat ground. Excavators are capable of climbing some very steep inclines, and drivers should proceed with caution when doing so.

2. USE EXPERIENCED OPERATORS

This work is not something the new guy should tackle. It takes coordination and experience to maneuver a slope. Have your operators start small, working on flat ground and gentle slopes before they graduate to the steeper slopes.

3. CHOOSE THE RIGHT TRACK

Single-bar grousers offer the best traction for slope work. They are similar to dozer tracks and will penetrate ground for extra traction, helping to hold the excavator



tightly to the slope. On the other hand, triple-bar grousers are good for flat and reasonable slopes, but they may slide once you begin work on 1-to-1 ratio slopes and other steeper jobs.

4. CHECK YOUR TRACK DIRECTION

Having the correct track orientation is crucial for safe slope work. Be sure your tracks are pointed up and down when working on the slope—not sideways. Drive motors are heavy, so you want more weight behind you. Idlers should be forward for uphill work and pointed down slope for downhill work. The idlers are designed to take the digging force of the

machine and spread it across the frame via through-axles connected to one side of the frame. Generally, the load factor should be over the idlers.

5. POSITION THE BOOM & ARM FOR UPHILL TRAVEL

Stretching out the arm and keeping the boom low to the slope places the weight of the bucket and boom ahead of the machine, so you can walk your way up. You can put the bucket teeth in the ground and use the arm to help pull you up.

6. ADJUST YOUR EFFORT ON THE CONTROLS

Slope work requires a lot of coordination

and thinking, as the operator is using their feet to run the travel motors, while using their hands for the controls. When operators are digging on a slope, they need to adjust the amount of effort put into the controls. An operator who gets off-level, especially if they're unskilled, can get into trouble quickly.

7. DON'T REPOSITION THE BOOM & ARM WHILE TRAVELING

Don't try to forge up the slope with the power of the travel motors while repositioning the boom and arm. Before repositioning, stop your forward motion, as the machine is apt to slide a little bit, especially if it features triple-bar grousers.

8. WATCH YOUR SWING

If you are digging a trench while on a slope, you want the boom and arm in fairly close to the machine when you begin swinging. When you come out of the hole, bring the mast in toward the machine so the swing torque will allow the machine to swing. If you are stretched all the way out, the momentum behind the swing is significant. So, bring the boom and arm in and pull the mast toward the swing bearing to assist the machine.

If you are swinging downhill, be very gentle on the swing motor. When coming off of the motor with a full bucket, the swing brake will work. However, if you have too much momentum, it will attempt to turn all the way back around and continue swinging downhill against the swing brake.

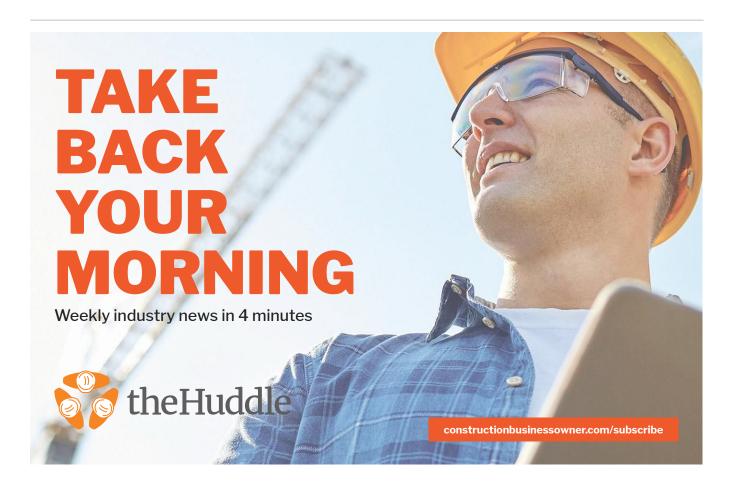
Don't place the bucket out too far. Pull the bucket in and swing gently so the swing brake can do its job. If the bucket is big and the material is heavy, and you are too far out on the arm, the momentum and weight will overcome the swing brake.

9. PROTECT YOUR ENGINE

Typical engine configurations are limited to a 30-degree (70%) slope for lubrication of the engine. Avoid exceeding that gradation for long periods of time because there is only have so much depth and oil in your pump. On severe slopes, it's hard for the engine to pump oil to the top of the motor, which results in starvation to the top of the engine, decreasing its life cycle. **CBO**



Matt Hendry is an excavator product consultant at Hitachi. With more than 25 years of experience in excavation equipment, Hendry uses his knowledge to ensure customers have the machines with the efficiency, reliability and durability they need to get the job done. Visit hitachicm.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.

HY-BRID LIFTS BY CUSTOM EQUIPMENT

PA-1030

Released: 3/21/19 Availability: U.S., Canadian & select European markets

What's new? A safer and more productive alternative to ladders and scaffolding

Specs: Features a platform that is 41 inches long by 20.5 inches wide and 10 feet high; 16-foot working height; 69-inch stowed height; tool tray; parts holder; USB ports; improved rear casters; see-through front board for better visibility
Circle 216 on card.



CEMEN TECH

AP Office & AP Mobile

Released: 1/22/19

Availability: U.S., Canadian & European markets
What's new? A cloud-based productivity solution that provides

users a complete view of their concrete business operations

Specs: AP Office offers front-end solution for scheduling, dispatch and fleet management functions; utilizes the latest in telematics technology and software; allows business owners to keep track of the status and location of each mixer in their fleet in real time. AP Mobile is designed for use on a phone, tablet or other mobile device; allows users to wirelessly send and receive production data

device; allows users to wirelessly send and receive production data between AP Office and the mixer, as well as view mixing parameters in real time; automatically syncs final job data with AP Office Circle 217 on card.







TYCON SYSTEMS

MobileSolarPro

Availability: All global markets

Released: 11/15/18

What's new? A low-cost, multipurpose mobile solar trailer that provides up to 20 amperes of green power wherever, whenever it's needed

Specs: Features a 650-watt solar array; 720-ampere-hour battery bank; remote, web-based monitoring; die-cast, all-weather enclosure with five-port gigabit power-over-ethernet [POE] switch; locking, four-position, 18-inch pneumatic telescoping mast for mounting lighting; security cameras; sensors;

90-mph wind rating; 3-year warranty

Circle 218 on card.



APT

ADP 10 Dust Collection System

Released: 2/20/19

Availability: U.S. market

What's new? A dust collection system that keeps the environment clean and reduces exposure level for operators, with a 99.58% filtration of exhaust air Specs: Kit includes a vacuum suction unit, 21-foot suction hose, universal shroud connector, environmentally friendly dust collection bags and three bellows; consumes 25-cubic-feet-per-minute per tool; features a plug-and-play system Circle 219 on card.



A RADIANS INC.

RWG4221HV

Released: 2/7/19

Availability: U.S. market

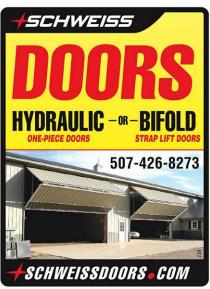
What's new? High-visibility fingertips and reminder that enhance visibility and increase mindfulness of hand protection among workers and supervisors Specs: Standard grain cowhide leather; keystone thumb; shirred wrist; cloth hem; high-visibility "Watch Your Hands" reminder and fingertips Circle 220 on card.

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Circle 139 on card.

Annual Value of Construction Put in Place

February 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 February 2019 figures. (Millions of dollars. Totals may not add up perfectly due to rounding.)

_	2017*	2018**	Feb 19
Total Private Construction	949,292	1,013,300	994,536
Residential	505,716	560,173	540,897
Nonresidential	443,576	453,127	453,640
Total Public Construction	286,408	292,227	325,769
Residential	6,737	6,753	5,652
Nonresidential	279,671	285,475	320,117
TOTAL Construction	1,235,700	1,305,527	1,320,305

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

\$1,320,305

FEBRUARY 2019 TOTAL ANNUAL VALUE OF CONSTRUCTION PUT IN PLACE

"Overall, business conditions at architecture firms across the country have remained generally healthy," said AIA Chief Economist Kermit Baker, Ph.D., Hon. AIA. "Firms in the South recorded continued strong design activity, likely reflecting a healthy regional economy & ongoing rebuilding from the catastrophic 2018 hurricane season."

AIA Architectural Billings Index (ABI)

	National		*Regional - Billings				*Sectors - Billings Multifamily Commercial/			
Month	Billings	Inquiries	Northeast	Midwest	South	West	Residential	Industrial	Institutional	Mixed
Sep-18	51.1	58.8	46.6	59.7	54.1	53.1	54.9	50.8	55.1	53.4
Oct-18	50.4	58.6	51.8	57.8	48.4	46.9	52.3	48.9	52.0	52.7
Nov-18	54.7	63.1	56.8	53.1	50.5	49.0	51.2	53.8	50.8	53.8
Dec-18	50.4	55.6	51.6	56.3	49.4	49.2	49.8	51.2	53.1	50.2
Jan-19	55.3	59.6	52.4	54.4	54.7	51.5	52.6	52.6	52.9	53.8
Feb-19	50.3	59.8	51.5	51.3	58.3	51.6	51.6	53.9	50.9	57.2

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 Architecture Billings Index (ABI).

^{**}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.

^{*}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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 $\label{eq:Falk} \textit{Falk} \ \textit{is a CPA} \ \textit{and senior product manager for Spectrum Construction}$ Software. He has over 20 years of experience helping construction businesses of all sizes capture and utilize the right information to move their businesses forward. He holds a bachelor's degree in business administration from The University of Puget Sound.

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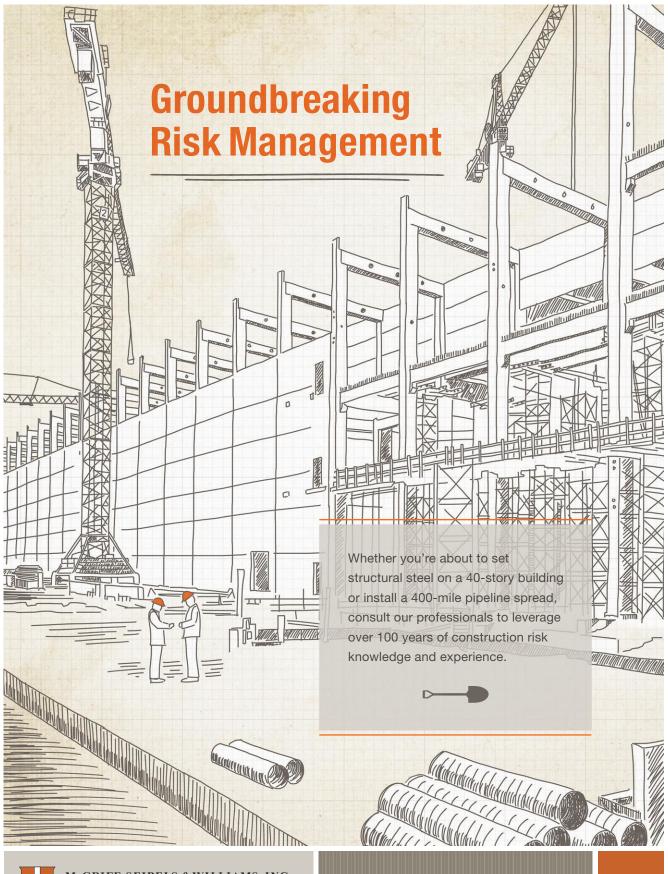
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