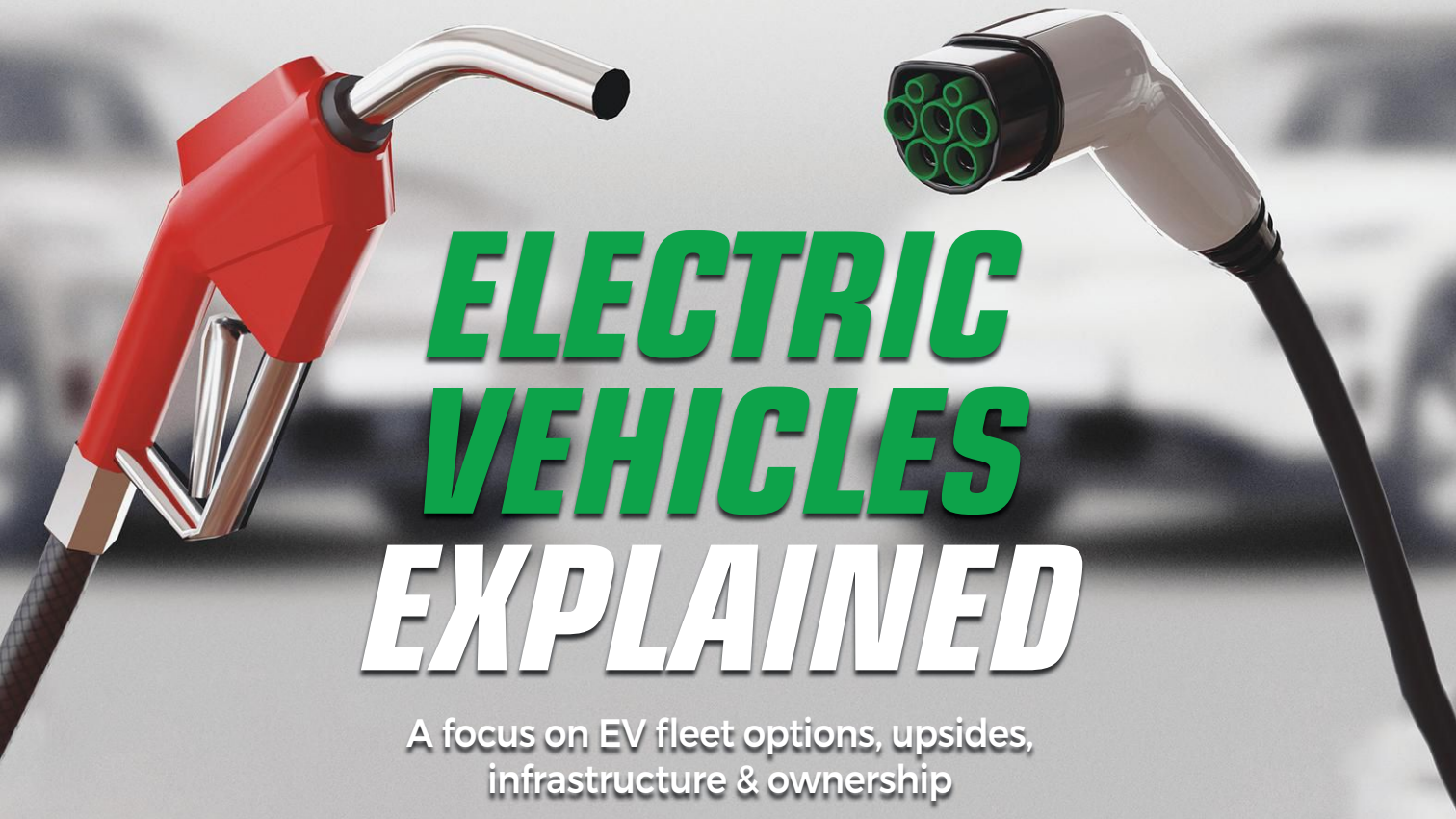
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FROM THE EDITOR

KATHY WELLS



Whatever February lacks in days, it makes up for in depth. Although it may be the shortest month of the year, for the editorial team at Construction Business Owner (CBO), these 28 days are a pivotal point in topic planning. Not only are we analyzing industry trends and highlights from one sprawling trade show, but we're also shaping strategies for the next. We're also exploring the experiences of construction professionals, tracking industry trailblazers, studying with subject matter experts — and we do it all so we can deliver more of what our readers want: solutions. Here's a quick recap of what we're currently working on and where you can find it:

- *5 Favorites From World of Concrete 2023* — We've returned from the annual trade show to deliver CBO's top picks in products and services. These tools and solutions will soon be making their way to the construction community, but CBO readers can see them now at constructionbusinessowner.com/WOC23top5faves.
- *Webinar: Tips for Effectively Managing Your Construction Business* — A construction project's success ultimately depends on how well the office and field work together. If the field and office aren't aligned, this directly impacts a project's ability to stay on schedule and budget. What can companies do to ensure every project runs smoothly? Join us to learn best practices for managing and creating processes that reduce risk and improve visibility. Register at constructionbusinessowner.com/webinars.
- *CONEXPO-CON/AGG 2023* — Held every three years, North America's largest construction trade show is set to take place March 14-18, 2023. The show, nearly 5% bigger than the record set in 2020, will feature 1,800 exhibitors and 150 education sessions. For the latest information and an inside look at the year's biggest trade show, follow along with us on Twitter @cbomagazine for live coverage and a front-row seat on the show floor.
- *CBO's Sustainability VIP* – Coming to you in our next issue, this special section returns for its third year and highlights the industry's top change-makers. Selected by our editors from a set of peer-submitted nominations, this year's finalists are developing and driving the initiatives that support different areas of sustainability. Look for more at constructionbusinessowner.com/svip2023.

Take good care,

Kathy Wells

CONSTRUCTION BUSINESS OWNER

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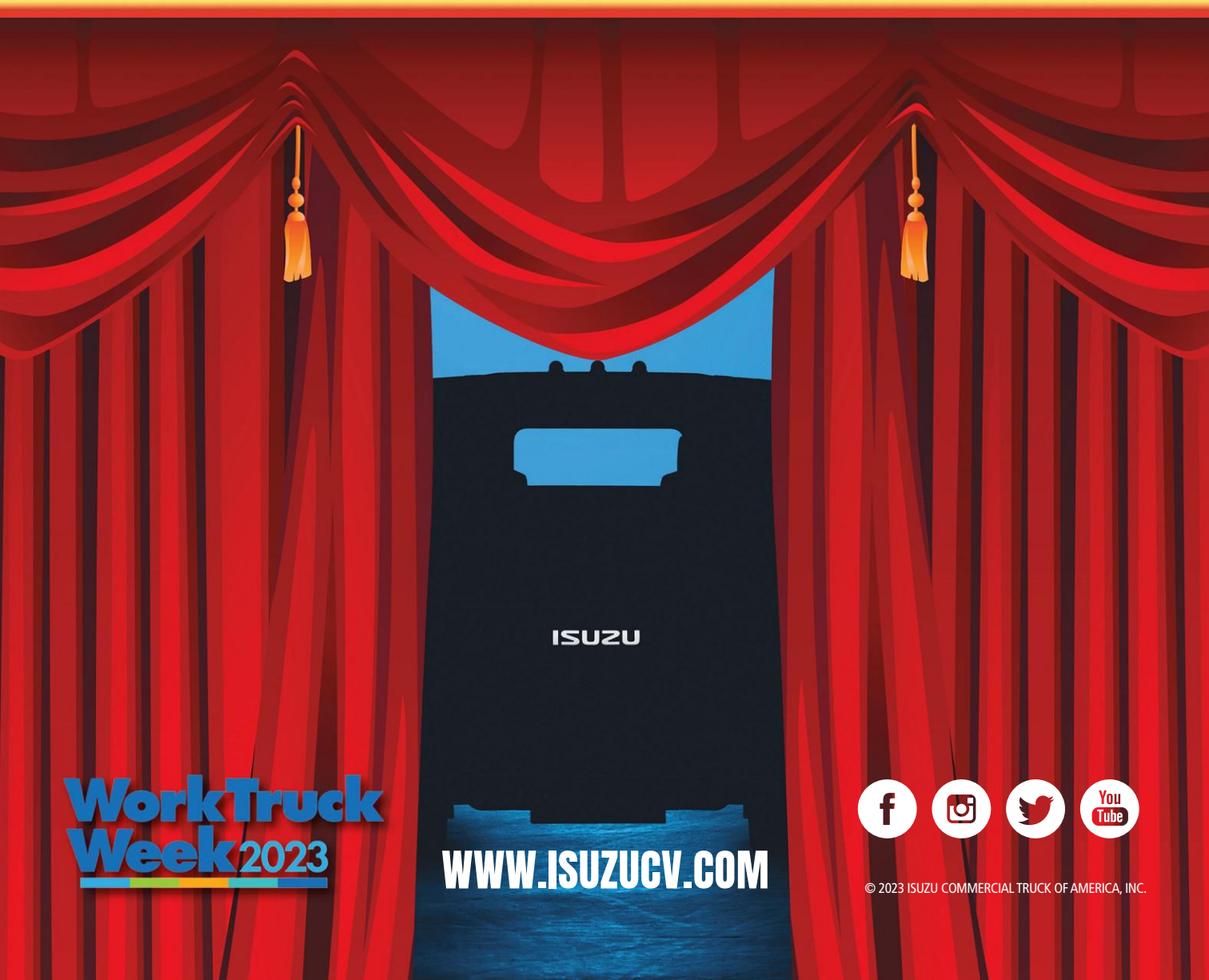
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Felling Trailers Appoints Klimek as Quality Assurance Manager



Dan Klimek

Felling Trailers Inc., a national manufacturer of industrial and commercial trailers, has appointed Dan Klimek to the role of quality assurance manager over both production facilities. Along with quality management, he will oversee weld production for the Litchfield manufacturing facility as the production manager. As the quality assurance manager, Klimek will continue developing, directing, controlling and managing the installation and maintenance of the company's quality assurance programs. Klimek and his team of inspectors work diligently to ensure that all stages of the build process meet company quality standards. In the role of Litchfield production manager, he will work with the production team to implement new processes and technologies to reduce lead time and increase team productivity. Klimek has over 30 years of manufacturing, quality control systems and processes. Visit felling.com.

ACPA Announces 2022 Lifetime Achievement & Distinguished Service Awards

The American Concrete Pavement Association (ACPA) has announced the winners of several industry awards, presented alongside the Excellence in Concrete Pavement Awards at its annual meeting. The 2022 Hartmann-Hirschman-Egan Award winner is Stephen Jackson of Cedar Valley Corporation (CVC). Under his leadership, CVC has been routinely recognized for outstanding quality, innovation and the consistent construction of smooth concrete pavements. Jim Mack, director of market development at CEMEX, received the Presidential Award for his advocacy for the concrete pavement industry and his work in the sustainability space. Mack is a former chairman of ACPA and currently serves on multiple working groups across the industry. The Marlin J. Knutson Award for Technical Achievement recipient is Tara Cavalline, Ph.D., of the University of North Carolina at Charlotte. Cavalline has brought about substantial developments in quality control of concrete paving and improved the use of recycled and waste materials. Angela Folkestad, P.E., is the executive director of the Colorado/Wyoming Chapter of ACPA and was selected as the 2022 Outstanding Promoter Award winner. Folkestad is an advocate for concrete pavement in Colorado and Wyoming and a nationally recognized leader on sustainability issues. Visit acpa.org.

Talbert Manufacturing Celebrates the Removable Gooseneck Trailer's 75th Anniversary

Talbert Manufacturing, a North American provider of specialized heavy-haul solutions, celebrates the 75th anniversary of the release of its non-ground bearing removable gooseneck trailer. First introduced in 1947, the removable gooseneck technology impacted safety in the heavy-haul trailer industry. Since its inception, Talbert has designed two different removable gooseneck trailers: the hydraulic detachable gooseneck trailers and the mechanical detachable gooseneck trailers. The non-ground bearing hydraulic detachable gooseneck trailers were first introduced in 1962. The design increases safety throughout the loading and unloading process by offering ample clearance and stability. In 1989, Talbert designed and patented the mechanical removable gooseneck trailer. The mechanical gooseneck trailers are more lightweight than their hydraulic counterparts and don't require hydraulics to position them. Talbert has been building heavy-haul and specialized trailers to rigorous customer specifications since 1938. The company offers complete lines of heavy-haul trailers and specialized transportation equipment for the commercial, industrial, military and government sectors. Visit talbertmfg.com.

Brown & Caldwell Appoints Stigers as Design Chief Engineer

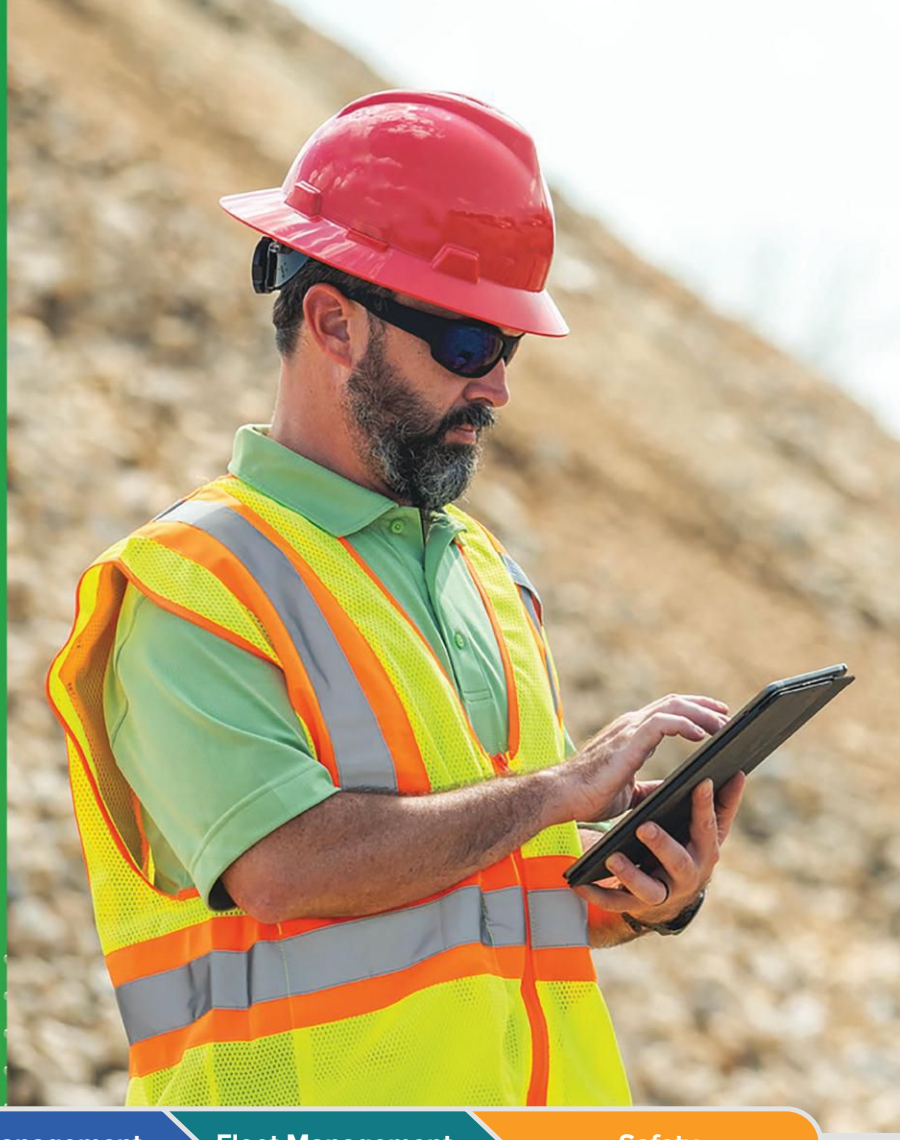


Tracy Stigers

Brown and Caldwell has appointed Vice President (VP) Tracy Stigers as design chief engineer in recognition of four decades of technical leadership and client service. She is the first woman in the firm's 75-year history to hold the title. Stigers will lead all design from a technical and delivery perspective across all of Brown and Caldwell's design initiatives, implementing innovation, quality control and project delivery throughout North America and the Pacific. Since joining the environmental engineering and construction services firm in 1980, Stigers has progressed from junior engineer to one of its top technical and delivery experts. She has vast experience in the design and construction of large-scale wastewater conveyance, treatment and reuse facilities, including serving as project manager on the San Francisco Public Utilities Commission's $2.3 billion Biosolids Digester Facilities Project, the largest value design job in Brown and Caldwell's history. Throughout her career, Stigers has held numerous leadership roles at industry organizations, including sitting on the board of trustees for the Water Environment Federation and the California Water Environment Association. Headquartered in Walnut Creek, California, Brown and Caldwell is a full-service environmental engineering and construction services firm with 52 offices and 1,800 professionals across North America and the Pacific. Visit brownandcaldwell.com.

American Contracting & Environmental Services Announces Leadership Changes

After nearly 20 years at the helm, Jim Voltz has stepped down as president of American Contracting & Environmental Services Inc. (ACE). He will remain active in the company and start a new role as director of innovation. As director of innovation, Voltz will use his



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expertise and experiences to assist ACE's alternative delivery pursuits, provide value engineering propositions and offer innovative improvements throughout the company. He will remain a key member of the organization's day-to-day operations. Executive VP Joe Godin has assumed the role of president of ACE and will focus on fulfilling ACE's 2040 growth plan. ACE also announced three promotions: Jeff Litwin as VP of finance, Kody VanFleet as operations manager, and Tyrus Hunter as director of business development. In addition, ACE will rely on VP of Estimating Jeff Carr and other key staff members to support ACE's long-term growth plans. ACE is introducing a new ownership structure with Godin as the majority owner and a group of existing company leaders holding a minority shareholder position. This is a new phase for the company as it brings existing employees into ownership. Visit aceservinc.com.

Angela Curry Named a Woman of Distinction by the Philadelphia Business Journal

Bentley Systems Inc., the infrastructure engineering software company, announced that its VP and Chief Compliance Officer Angela Curry was named a 2022 Woman of Distinction by the Philadelphia Business Journal. The Women of Distinction program recognizes women in the business community who are blazing a trail at their respective companies, are respected for accomplishments within their fields, give back to the community, and are sought out as respected advisers and mentors. Curry's accomplishments at Bentley include initiating the review of the company's professional and internship programs, resulting in broadening the scope and revising Bentley's hiring process to promote diversity within the organization. She also supports the company's education initiatives, including partnering with historically Black colleges and universities, providing no-cost engineering software and mentorship for students working on senior engineering projects. Curry also supports Bentley's Inclusion, Diversity and Equity Alliance (IDEA), a platform for educating colleagues on how to identify racism, discrimination and bias in the workplace. Moreover, she has implemented rigorous diversity, equity and inclusion (DEI) training within the company. As chief compliance officer, she is responsible for managing Bentley's regulatory compliance programs that cover privacy and data protection, export controls and trade compliance, and compliance and ethics. Visit bentley.com.

Rimon Adds Scott Chait as Equipment Leasing & Finance Partner

Global law firm Rimon adds Scott Chait as an equipment leasing and finance partner in New Jersey. Chait joins the firm from Sumitomo Mitsui Banking Corporation, where he served as a director and as in-house counsel. Chait has served as in-house counsel for two of the top 100 equipment leasing and finance companies in the U.S. (as measured by The Monitor 100); as an attorney with a law firm focusing on equipment leasing and finance; and in an in-house counsel role, as well as a non-legal role, within the business operations and documentation units at another well-known equipment leasing and finance company. Chait has negotiated, structured and drafted all manners of direct originations, syndications, assignments, refinancings, workouts, vendor/dealer referrals and remarketing programs. Rimon has 48 offices across five continents. Visit rimonlaw.com.

Graycor Hires Steve Cieslak as Chief Financial Officer



Steve Cieslak

Graycor announced that Steve Cieslak has joined its team as chief financial officer (CFO). Cieslak previously served as CFO of North America at Nordex Group, a manufacturer of wind turbines with more than $1 billion in annual revenue. In his new role, Cieslak will be responsible for Graycor's information technology, corporate level finance and accounting, including production of financial statements, receivables, payables processes, payroll and financial controls. He will work out of the Oakbrook Terrace, Illinois, office and serve as a member of the company's executive committee. Founded in 1921, Graycor is a provider of construction, maintenance and facilities services throughout the U.S., Canada and Mexico. Visit graycor.com.

Hilltip Acquires Industrial Metal Products Inc.

Hilltip, a manufacturer of snowplows, spreaders, de-icing sprayers, sweepers and other road maintenance equipment, has acquired all assets of Industrial Metal Products Inc., an Indiana-based manufacturer of truck beds and other quality metal products. The acquisition of Industrial Metal Products will allow Hilltip to manufacture its products in North America using the company's Fort Wayne, Indiana, facility, which will immediately get an expansion for increased production and storage capacity. Hilltip will establish staff resources and a customer service team to better serve dealers and customers in the U.S. and Canada. Industrial Metal Products will continue production and development of its existing product line as a separate division of Hilltip, and it will still carry the Industrial Truck Beds brand name. Headquartered in Pietarsaari, Finland, Hilltip Oy is a manufacturer of road maintenance equipment in Europe. With equipment designed and built in an area that averages at least six months of snowfall every year, Hilltip is known for its durability and advanced technologies. Visit hilltipna.com.

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ASK THE EXPERTS

What's the best source for hiring?



Julie Davis
Senior Director of Workforce and Industry Initiatives
Association of Equipment Manufacturers

"Have you ever talked to someone who has an engine spread out in their garage, is wiring their buddy's hunting cabin, or is the neighborhood handyman and, based on their hobbies, interests and personal aptitude, thought they would be a good fit to work for you? Imagine if you could widen your hiring net to consider people based on the skills, talents and interests that would make working for you a good fit for them instead of hiring someone based on the skills they used in the job they could get as a 20-year-old. (Let's face it, none of us were working in the job we wanted at that point — we were working in the job we could get.) This is exactly how skills-based hiring works, and it results in having a wider talent pool to recruit from. The catch is that you need to be able assess their skills and then train them to competency. The reward is a wider talent pool trained to your specifications, and higher retention because they love the work."



Eric Glasow
President
GCI Services Inc.

"Our employees are our best source for hiring — they help recruit top talent and sell them on our company culture."

In a sample of responses submitted by CBO readers, the top three answers to this question were:

1. Relying on employee referrals
2. Hiring away from the competition
3. Word of mouth

What's your take?

We want to hear from you! To submit a response to next month's question, scan this code and complete the form.



YOUR 2023 NOMINATIONS ARE IN!

SUSTAINABILITY VIP 2023

Thank you for submitting nominations for Construction Business Owner Magazine's Sustainability VIP 2023. This special section — coming soon in our March 2023 issue and on constructionbusinessowner.com — recognizes the efforts and ingenuity of yet another group of exceptional finalists who are working to build a better, more sustainable future.

Sustainability VIPs are construction industry professionals who have developed programs or launched initiatives within their companies to support any of the following areas of sustainability:

- Industry and infrastructure
- Clean energy, water and sanitation
- Recycling and responsible consumption and production
- Protection of climate, wildlife and waterways
- Sustainable cities and communities
- Green building and LEED efforts
- Humanitarian efforts (poverty, hunger, equality, health, wellness, education, employment)

To catch the announcement of our 2023 finalists, visit constructionbusinessowner.com/svip2023 or scan the code below.

CONSTRUCTION BUSINESS OWNER

Think Like a Football Coach to Build a Winning Team

Why you need these 6 types of players in these 6 positions



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

Just Ask George.

Send your questions for Hedley to Editor Kathy Wells at kwells@cahabamedia.com.

If you owned a professional NFL team, you would need players with different skills and strengths to win. For example, a team wouldn't win many games without a great quarterback to precisely pass the ball, powerful linemen to block, fast ends to catch anything thrown their way, linebackers to tackle quick runners, or kickers to accurately split the uprights. In other words, every team needs the right players to be successful.

The same wisdom applies in a construction company — you need people with different abilities, skills and experiences to produce superior results, grow and make a profit. The many talents required to operate a construction company are listed below. What are the top two strengths, talents or positions you're best suited for?

- Sales and marketing
- Managing people
- Estimating
- Project management
- General field superintendent
- Project superintendent
- Crew foreman
- Crew worker
- Equipment operator
- Safety manager
- Equipment manager
- Project administrator
- Finance, accounting and bookkeeping
- Administration and office management
- Human resources
- Hiring and recruiting
- Training and education
- Computers and technology

As construction companies grow, owners quickly learn that they can't do it all themselves. They need help to accomplish all the demands. The same is true for NFL teams. Professional football teams are generally organized as follows:

- Owner
- General manager
- Sales manager
- Head coach
- Assistant coaches
- Trainers
- Players
- Support staff
- Finance
- Administration

Obviously, football team owners also don't act as head coaches, and head coaches don't get on the field. Unlike professional football organizations, some owners of construction companies perform too many tasks they aren't qualified to do. When I was building my construction company, I thought I was good at everything. In retrospect, I was terrible at managing employees — I micromanaged, did not let go or delegate, made decisions for others, changed my mind, and did too much myself. As a result, we had a high employee turnover

rate caused by my poor management style, creating continuous problems.

- What are you doing that you shouldn't do, holding your company back from profitable growth?
- What positions are being handled by the wrong people with the wrong talents and attitudes?
- What positions need a new or better qualified person to allow your business to grow?

Company owners should only perform tasks and roles they have the skills, attitude and management technique to excel at. To build a great company, I find most successful owners are best at overall leadership, vision, winning work, building customer relationships, estimating, developing talent and communicating the big picture to the employee team.

Unfortunately, owners are generally not good at managing employees, tedious details, project management, field operations, production, following company systems and having regular meetings.

6 Types of Players for 6 Required Positions

Construction companies need each of these six types of players to stay organized, achieve their goals and make a profit. Every person — including company owners — has one or two talents, roles or activities they're the best at and should perform. Review this list and select the top two categories which describe you, your abilities and what you want to perform.

1. Owner - President - Entrepreneur - Visionary Leader

- Implements and achieves the vision, core values and culture.
- Focuses on the future, profitable growth and new opportunities.
- Monitors growth, sales, systems, structure and talent development to achieve results.
- Provides motivation to meet goals.
- Creative, ambitious innovator with lots of new ideas.
- Continually identifies the need for improvement and change.
- Has good instincts and gut feelings for the right solutions.
- Likes to be in control.

2. Coach - Team Leader

- Motivates players to perform at their highest level.
- Achieves results by developing and directing strategy, playbook and calling plays.
- Manages and coordinates the team, activities and workload.
- Monitors and manages performance, production, quality, schedule and safety.
- Directs talent development training program and team meetings.
- Mentors, trains and encourages players to improve and meet their goals.
- Builds teamwork, solves problems and helps team stay on track, focus and win.

3. Manager - Supervisor - Foreman

- Responsible for organizing team and achieving results.
- Holds people accountable to perform, achieve goals and meet deadlines.
- Develops, implements and enforces systems, standards, plays and procedures.
- Keeps track, monitors and reviews results, progress and details.
- Likes systems, structure, regular schedules and meetings.
- Plans ahead; schedules subcontractor; orders materials and equipment; and monitors players needed.

4. Player - Worker - Talent

- Implements plays, activities and tasks on time and safely with quality workmanship.
- Follows company systems and plays per standards and deadlines.
- Steady and reliable.
- Excels at one or two strengths, talents and positions.

5. Support Team

- Supports, coordinates, administrates and helps others succeed and accomplish tasks and goals.
- Responsible, trustworthy, multitasker with a positive attitude.
- Manages tasks, systems and standards.

6. Scorekeeper - Accountant

- Monitors statistics, score, performance, and results of company, projects, team and players.

What's Your Role?

As a business owner, your primary role must be "visionary leader," which includes innovation and improvement. In addition, as the leader of your company, you must also focus on growth, sales, customer development, talent development, and implementation of systems and structure.

Your secondary role, whatever it may be, must be identified from the initial list of talents.

Only Do What You Do Best

When owners handle things they're not right for, problems occur, players don't perform to their abilities, and profit tends to shrink and fade. Additionally, owners in the wrong roles tend to think the rules and deadlines don't apply to them. This sets a bad example for others and causes them to reduce their production as well.

Football teams can't win games without the right players in the right positions. They also won't win with the owner out on the field trying to be a player. And your company can't win with the owner doing the wrong things in the wrong positions either! What do you need to stop doing and assign to the right players who will get things done so you can achieve winning results at a higher level? ▲

Are Your Managers in Tune With Your Business?

Why some great employees fail to launch



GREGG M. SCHOPPMAN is a partner 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. Contact Schoppman by email at gregg.schoppman@fmicorp.com. Visit fmicorp.com.

A leader of a construction organization once said, "I hired a senior project manager. This manager had an amazing pedigree. Worked for amazing organizations prior to mine. Trained in all the best systems and software on the market. Then this manager came into my business and failed miserably. Barely lasted six months. So much for hiring the best and the brightest, huh?"

Several years ago, I wrote an article about making the Starbucks cup of coffee. In short, it was about how a multibillion-dollar organization with hundreds of thousands of associates could all create the same cup of coffee and also charge a premium price. How did they manage to do that? Among many elements on their recipe card were their abilities to create standardized processes, utilize consistent tools and drive metrics throughout the businesses even as customers demand customized products.

So, the question for construction businesses owners is: Are your managers and superintendents creating one cup of coffee, or are there multiple methodologies in your organization — drip coffee, pods, percolators, French press, etc.? This brings us back to our leader from above. How can a seemingly amazing project manager fail to launch?

There are certainly plenty of duds and people who exaggerate their résumés and applications. But why do competent candidates fail? Hypothetically, Starbucks has a great system, and it would also be safe to assume they have a few good baristas. Let's say their No. 1 barista leaves to work for Dunkin' or Tim Hortons. This would be a coup in the coffee world — or would it? The competition will set this superstar out on day one to brew coffee and serve the customers. Without guidance, that barista will simply default to the way they did it at the old place. More importantly, there will be new equipment, new processes and an entirely different culture. In the end, the superstar coffee-maker will look like a watered-down decaf that's been sitting on the burner too long.

How many individuals have been hired into your organization who looked like a home run but ultimately disappointed? They were talented and seemingly capable free agents. They would have made an immediate impact without the level of training a junior associate requires.

Furthermore, it only makes sense to expect more of a return on the investment since these associates likely expect higher compensation. If your organization cannot seem to break through when hiring those great candidates, it might be a great time to reflect inward.

Infrastructure

Every business should have their own way of doing business. Starbucks has



their way, and it works for them. Inserting their model into another coffee shop may not achieve the same results. The same concept holds true for a construction business. What works for one brand may not work for your business. Software, client type, support staff and culture: There is a litany of external variables that served as catalysts for a manager in their previous environment. Inserting that manager into your organization does not automatically mean similar results. One of the best ways to ensure replicability is to ask about their environment to determine if there are parallels. Do you use the same platforms? Do you share similar trade partners, process concepts or overall philosophies?

Second, when the senior associate begins, that infrastructure has to be in place. The processes, tools and firmwide metrics must exist. If they do not, that person will simply default to whatever system they utilized in their previous life.

Everyone loves hearing the phrase, "At my old company, this is the way we used to do it … " The skin of current associates begins to crawl, and they mutter under their breaths, "Well, if it was so good, why did you leave?" Ultimately, the lack of infrastructure and control breeds contempt. More importantly, it may mask performance issues. Put another way, are margin erosion issues related to the manager, the lack of process or both?

Cultural Fit

Every business or team has a culture. Some are positive and strong, while others can be toxic. The toxicity may start to manifest itself from that previous comment: "If it was so great where you worked before, why don't you go back?" Rifts start small but tend to become unmitigated canyons when mismanaged or left uncontrolled.

Managers quickly become branded as malcontents when they aren't playing well in the "company sandbox" or "following the system" — even if there isn't a system to follow.

Cultural fit is so important, but it is hard to gauge this in an interview. Determining whether someone can use a scheduling or project management software is relatively easy. Ascertaining whether someone will have the DNA to mesh well with a team is slightly more difficult. In fact, the lack of process and tools simply exacerbates cultural misalignment. Someone who may not fit well with a team may further drive a wedge between them and the rest of the business by reverting to a previous life.

There are solutions to help teams determine better alignment. Questions around firm values (i.e., "Tell us a time where you had a difficult client and how you relayed bad news," or "How would you prioritize a project that was behind schedule but also had a trade partner that was safety challenged?") help gauge how someone might respond to a given situation. Case studies built from real firm examples also provide opportunities to see how a candidate would answer. There are no right or wrong answers — just answers that correctly align to the firm.

Best-in-class firms will always leverage the abilities of talented, seasoned associates in the marketplace. Those same firms will also make sure that those talented individuals marry together on more than just a polished résumé. Most importantly, firms will ensure new managers not only make a great cup of coffee, but your firm's cup of coffee. ▲

Tips for Maximizing Your Savings During Tax Season

The contractor's tax-credit strategy guide



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With supply chain dynamics, inflation and rising material costs, contractors are experiencing heightened pressure on their margins. Reducing income taxes through effective planning is one way to put cash back into contractors' pockets.

The following will take a quick look at several tax savings strategies.

Section 179D & Section 45L

On Aug. 16, 2022, Congress passed the Inflation Reduction Act of 2022 (IRA), which extended and created energy-efficiency tax benefits. Sections 179D and 45L are two energy-tax savings ideas that contractors should consider.

1. *Section 179D* — Section 179D is a deduction for commercial builders. The tax deduction provides of up to $1.80 per square foot for the installation of systems that reduce the total energy and power costs. For tax years beginning after Dec. 31, 2022, the maximum deduction increases to a sliding scale between $2.50 and $5 per square foot, depending on the energy-efficiency increase with respect to the Reference Standard 90.1. Below is a summary of certain rules:
   - Commercial building owners and designers of buildings owned by government entities and not-for-profit organizations are eligible.
   - Equipment must be installed with a plan to reduce total annual energy and power costs of the building by 25% to 50%.
   - Prevailing Wage Requirement & Apprenticeship Requirement — In order to take certain deductions under 179D, contractors need to ensure that they meet local prevailing wage and apprenticeship requirements for employees.
2. *Section 45L* — Section 45L is a tax credit that promotes the construction of energy-efficient residential dwellings. This allows the developer to claim a tax credit for each dwelling unit. The IRA extended the section 45L credit to the tax year ending Dec. 31, 2032, and increased the credit per unit from $2,000 to a maximum of $5,000. Section 45L was allowed for residential buildings with no more than three stories. The IRA removed the high restriction in 2023.

Employee Retention Credit

The Employee Retention Credit (ERTC) established by the Coronavirus Aid, Relief and Economic Security (CARES) Act has proven to be a great benefit for taxpayers who experienced hardship during tax years 2020 and 2021. Consider these key points when evaluating the potential benefits of this credit.

- If you experienced a governmental shutdown or a decline in gross receipts related to tax years 2020 and 2021, you may be eligible for the ERTC.
- Originally, contractors were not allowed to obtain the Paycheck Protection Program (PPP) loan and claim the ERTC; however, the CARES Act



changed this, and contractors are now eligible to take advantage of both if eligibility requirements are met.

- The ERTC is claimed by amending payroll tax return Form 941.
- For 2020, eligible employers can claim a credit equal to 50% of qualifying wages (up to maximum of $10,000) per employee.
- For 2021, eligible employers can claim a credit equal to 70% of qualifying wages (up to maximum of $10,000) per quarter per employee.

State & Local Tax Workaround

The IRS has given notice to allow deductions as business expenses at the entity level for state and local taxes imposed and paid by the entity, instead of carrying such payments as nondeductible itemized deductions over the current tax maximum of $10,000. The pass-through entity would then pass through to the taxpayer this business deduction as a credit for each state.

This needs to be evaluated on a state-by-state basis since each state has its own set of rules. Some of these elections need to be made by the partners/shareholders and not the entities.

Bonus Depreciation — Section 168(k)

Currently, certain assets are eligible for bonus depreciation, which means contractors can write off a percentage of the cost of the asset when purchased. Percentages are as follows:

- 2023: 80% bonus depreciation
- 2024: 60% bonus depreciation
- 2025: 40% bonus depreciation
- 2026: 20% bonus depreciation
- 2027: 0% bonus depreciation

Business Interest Limitation Depreciation Changes — Section 163(J)

This interest limitation was implemented in the Tax Cuts and Jobs Act (TCJA) of 2017, which limited business interest expense to 30% earnings before interest, taxes, depreciation and amortization (EBITDA) (50% for 2019 and 2020).

In prior years, taxpayers were able to add back to their taxable income depreciation expense, which helped increase the amount of the interest expense deduction. However, starting with the tax year ending Dec. 31, 2022, this will not be allowed, which could drastically decrease some taxpayers' ability to deduct interest expense.

There are two exemptions that contractors should consider when it comes to tax planning:

1. Small businesses are exempt of this limit. Small businesses for tax year 2022 are those with an average of less than $27 million in gross revenue in the prior three tax years.
2. Real estate and construction businesses can elect to be treated as an electing real property trade or business. Taxpayers will not be subject to the interest expense limitation under this election, but will need to adopt the alternative depreciation system (ADS) for all nonresidential real property, residential rental property and qualified improvement property. The ADS requires assets to be depreciated over a slightly longer useful life. In addition, bonus depreciation is not allowed on these assets. ▲

How ESG Impacts the Engineering & Construction Industry

The growing value of environmental, social & governance programs

BY CRAIG ADOOR & LYNN RYAN

The past decade has seen a steady process of consolidation in the engineering and construction industry (E&C). Despite some modest pauses and the adverse effects of the COVID-19 pandemic, merger activity has generally increased year over year, with 2021 posting a record 641 E&C transactions. Furthermore, the first half of 2022 largely kept pace with the prior year's record levels, which is remarkable given the slowdown in the larger deal market.

Many industry veterans expect the trend to continue, despite macroeconomic data that suggest a deceleration in deal activity in 2023. According to a report published this past summer by the consulting and investment banking firm FMI, two-thirds of E&C leaders believed their companies were more likely to engage in mergers and acquisitions (M&A) in 2022 than in the previous year. The most popular rationale for M&A among those surveyed was the desire to enter new markets and new geographies. By necessity, this will lead many potential acquirors to assess companies with which they have limited experience or knowledge, and this in turn puts a great deal of importance on the due diligence process. When asked what factors are at play hindering an acquisition strategy, roughly one in four respondents to the FMI survey mentioned a lack of attractive targets. For companies that are prospectively on the sell side, this is both good and bad news. On the positive side, this means there are a significant number of suitors that have not found their match (or matches) in the marketplace and are still looking to acquire; however, this also suggests that the recent frenzy of deals has removed the most attractive targets from the market, leaving companies that might not have the qualities acquirors are seeking.



In order to command buy-side interest and top-of-the-market premiums, E&C companies eyeing an exit need to differentiate themselves in a manner that illustrates the value of the underlying operation. Most obviously, this translates into strong, profitable books of business in complementary geographies, but not all companies seeking to merge can stand out in this way.

There are still some approaches, however, that E&C companies can take to enhance their attractiveness to potential suitors. Chief among these is developing and implementing an environmental, social and governance (ESG) program.

ESG & Corporate Value

ESG has quickly risen to the top tier of boardroom concerns throughout corporate America because of its discernable impact on valuations and capital raising. In the first quarter of 2022, for instance, ESG-themed funds

accounted for 26% of all newly launched passive exchange-traded funds. Similarly, ESG-themed funds counted over $300 billion in assets, a more than tenfold increase since 2011.

It is difficult to ignore ESG when so much capital is being funneled into ESG-friendly enterprises, but ESG is exerting an impact on the E&C industry beyond attracting potential capital investment — it can also have a positive role to play in recruiting new talent. ESG rates as a topic of high interest among younger professionals; numerous recent surveys and studies have revealed that Generation Z and millennials routinely rank social issues and sustainability more highly than previous generations. After all, it was these younger cohorts that powered the rise of ESG investing noted above. Relatedly, E&C companies are struggling to recruit and retain employees. A recent Deloitte report listed workforce and talent issues as being a headwind for the industry, noting: "The impact of not filling job openings can negatively affect E&C firms in more ways than one, including project delays and cancellations, projects being scaled back, inability to respond to market needs, losing project bids, and failing to innovate, among others."

For E&C companies, ESG becomes a means to address several issues related to corporate value at once. Implementing a well-resourced program can differentiate a firm, potentially adding value in the deal market, as it also positions the firm to recruit the young talent needed to power future growth.

ESG in the Due Diligence Setting

E&C companies looking to launch ESG efforts could benefit greatly from examining how ESG is evaluated in the deal context via due diligence and ensuring their programs account for those areas of concern. Typically, these include:

1. *Environmental/Sustainability* — Does the target track and report on its consumption of paper, plastic, water, electricity and natural gas? Does it have plans to reduce consumption of these items over time? If so, has it achieved any specified goals to minimize its impact on the environment and to use recyclables as much as possible?
   - Does the target focus on the selection of eco-friendly materials, smart technology, product design, construction methods and recycling opportunities in order to reduce their sizable carbon footprints?
   - Does the target outsource emissions



ESG is exerting an impact on the E&C industry beyond attracting potential capital investment — it can also have a positive role to play in recruiting new talent.

to subcontractors or third parties to ensure overall carbon footprints of projects are reduced?

- Does the target seek to manage water efficiency in project design and delivery?

2. *Occupational health, safety and welfare* — Investment in training, safety management and auditing is crucial to maintaining proper working conditions. In general, companies should seek to properly train employees and focus on building a strong culture emphasizing safety, spanning from jobsites to the corporate office.
3. *Community engagement and impact* — Maximizing positive impacts on communities is an important metric in analyzing ESG in the E&C industry. An ESG plan that is part of the essential corporate strategy includes:
   - Participation in the design-build aspects of projects that enhance community viability and economic development, particularly in less affluent census tracts.
   - A track record of supporting and implementing items contained in community benefits agreements (CBAs) in the design-build of major developments.
4. *Diversity, equity and inclusion (DEI)* — Who comprises the executive and senior management of the target? Has the company implemented a DEI program? Is it complying with that program? Have there been efforts to diversify its management or its employee base? Does the company have programs, targets, and/or systems to track hiring practices? If there is an incentive compensation plan, are awards or payouts tied to the achievement of ESG goals or targets?
   - Has the target ever entered a "teaming agreement" with a minority-owned firm to win new business or delivery on existing projects?
   - Does the target have a minority supplier program that seeks to identify and utilize a network of



minority-owned businesses when possible?

- All operating companies listed on the Nasdaq stock exchange must use the Board Diversity Matrix provided by the Nasdaq or use a format substantially similar to that to annually disclose board-level diversity data in their proxy statements, their Forms 10-K or 20-F, or on their respective websites. With certain exceptions and permutations (and subject to phase-in or transition periods), Nasdaq-listed companies will have to have or explain why they do not have "diverse" directors as that term is defined in the Nasdaq's corporate governance requirements. The explanation for not having done so must be provided in advance of those companies' next annual meetings in their proxy statements or on their respective websites. There are also certain states that have adopted legislation or in which legislation is pending regarding board diversity objectives applicable primarily to publicly traded companies. Details on board of director diversity is well beyond the scope of this article. For additional information, however, see Husch Blackwell's "Diversity on Public Company Boards of Directors." Knowledge of and achieving these board diversity objectives will be of great importance to publicly traded companies.

Engineering and construction companies that effectively implement ESG-related initiatives could enhance their attractiveness to larger industry players looking for growth via mergers and acquisitions. In short, ESG programming should be viewed as an investment — not a cost center — that can add to corporate value, either in the form of an exit transaction for existing shareholders or as a means to attract talent amid the labor scarcities with which the industry currently struggles. ▲



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Dealing With Reductions in Force

How to prepare for economic slowdowns & staffing changes

BY RICHARD D. ALANIZ

More than 10 million jobs remain open, even after several months of record hiring. May 2022 saw 384,000 jobs filled, and June payrolls increased by 372,000. In July, the number of jobs filled exploded to 528,000. Each month exceeded estimates, which seemingly contradicts other signals of economic slowdown. Despite the currently resilient job market, the Federal Reserve continues to raise interest rates in response to the highest inflation rate in decades, which could amplify the effects of any slowdown.

With inflation and rising interest grabbing the headlines, layoffs have already begun in certain sectors of the economy and have flown relatively under the radar until recently. Amazon eliminated 10,000 jobs across several divisions. Meta, the Facebook parent company, cut 11,000 jobs. Ride-sharing company Lyft recently announced that it reduced its workforce by 13% following recent 2% cuts. Car sales company Carvana announced plans to cut at least 12% of its staff, or 2,500 employees. JP Morgan Chase & Co. laid off more than 1,000 employees in its home-lending department. Real estate brokerage Compass laid off almost 10% of its workforce and Redfin, another brokerage, laid off approximately 6% of its workforce. RE/MAX announced that it would lay off 17% of its workers by the end of 2022.



The trend of layoffs may continue rippling through workplaces, and additional sectors such as retail, hospitality and manufacturing could be affected.

If the need to reduce staff reaches your workplace, there are a number of issues that you must carefully evaluate before taking action. First, you must decide whether to furlough employees or implement a layoff or reduction in force (RIF). Despite the terms sometimes being used interchangeably, there is a difference.

If the need to reduce staff reaches your workplace, there are a number of issues that you must carefully evaluate before taking action. First, you must decide whether to furlough employees or implement a layoff or reduction in force.

A furlough is an involuntary, temporary period of reduced hours or time off that carries an expectation that employees will return when business conditions improve. Furloughs are unpaid, but many employees use accrued vacation or other paid leave. Unemployment benefits are also generally available to furloughed employees. Furloughs permit employers to temporarily cut labor costs but still retain trained employees who will be needed when business rebounds.

A layoff or RIF, on the other hand, is intended to be a permanent termination of the employment relationship. Unless the expected downturn in business is temporary — no more than several months at most — a layoff/RIF is probably the preferable business decision and may occur with the complicating factors that come with more permanent action.

There are several significant issues that must first be addressed in deciding upon a possible layoff or RIF. An important and basic first step should be to examine and document the business case for a layoff/RIF.

Such documentation could become critical evidence in the event of later legal claims. It should provide a big picture summary of the reason(s) for the layoff and its extent, as well as the financial impact, or more specifically, the cost of the layoff versus the anticipated savings. The documentation should include a description of the planning and analysis done in considering the need for a layoff, particularly the proposed selection process.

In the reduction process, you should look at roles or positions, rather than the individuals filling them. Compare the various incumbents based upon predetermined objective criteria that are consistently applied.

One topic of potential legal concern in the layoff selection process is the possibility that you are disproportionately selecting for employees in a protected class. For example, a selection process that produces a group of selectees primarily made up of employees aged 40 and above could constitute a prima-facie case of age discrimination under the Age Discrimination Employment Act (ADEA).

Once selections for layoff have been made, the next concern is whether the number of employees triggers the requirements of the federal Worker Adjustment and Retraining Notification (WARN) Act, or an applicable state WARN act. The requirements of these laws are strictly enforced.

Generally, for the federal WARN Act to apply, the company must have at least 100 employees and the layoff must affect at least 50 employees. State WARN acts may have different thresholds for coverage. Because of the complexity of steps for compliance, this is one issue you should address with the involvement of legal counsel.

In addition to ensuring WARN Act compliance, an employer must also comply with the state law requirements for final pay, accrued vacation time and similar matters.

This then raises the related question of whether severance pay will be provided to laid-off employees. While severance benefits are often mandated by collective bargaining agreements, there are few statutory requirements to offer severance pay. If you offer severance pay, it should without question be conditioned upon a full release of all potential legal claims by the employee to receive severance pay. In the case of employees 40 and above, the release must comply with the provisions of the Older Workers Benefits Protection Act (OWBPA). The advantages of obtaining a full release of potential claims are often well worth the cost of at least some severance payout.

It remains to be seen whether economic conditions will ultimately cause significant layoffs across various industry sectors. Hopefully we will not see a repeat of the circumstances that prevailed in 2008-09.

Nonetheless, it is not too soon to at least give some consideration to how you would approach employee reductions should such a need arise. ▲

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6 Tips for Transitioning Your Bond Program

How to upgrade your bonding capacity from fast-track to standard

BY GREG ANGEL

Typically, contractors that require small and infrequent or one-off performance bonds apply for a fast-track program. This application process is quick and simple and does not require much financial or underwriting information. It is ideal for contractors that need construction bonds under $500,000. Approval is based primarily on the applicant's credit score, and a completed application can be approved by the surety company within a day. A standard bond program, however, requires more complex financial information and cost systems from the contractor and takes more time for the surety to approve. So why would a contractor want to upgrade to a larger, more traditional standard bond program?

Firstly, the Infrastructure Investment and Jobs Act is anticipated to revitalize America's infrastructure and drive significant job growth in the construction industry over the next few years. It will modernize and upgrade our roads, bridges, ports and other key infrastructure assets desperately in need of repair. A standard program will enable a contractor to take on these larger government projects* which require construction bonds, thus procuring more work for their pipeline.

Secondly, a contractor can save money by securing a lower bond rate. Fast-track bonds are typically charged at a higher rate depending on the surety and can differ in single and aggregate limits. Standard program rates can be remarkably less, allowing the contractor to bid more competitively and improve profit margins.

Here are a few key steps that a contractor can take to successfully transition from a fast-track bond program to a standard bond program.

1. Partner With Key Financial Advisers

Establish a relationship with an experienced surety agent who has access to and a thorough understanding of several different surety markets. They will be able to negotiate the largest program and most competitive rate/indemnity structure on your behalf and will be your best advocate when times get tough.

A well-established surety agent should also be able to recommend a certified public accountant (CPA) who knows the construction industry inside and out, as well as a commercial bank that is comfortable with construction lending.



2. Improve the Presentation of Financial Statements

Prepare a CPA financial statement, specifically a CPA review. Although CPA-prepared financials can be costly, this amount can be offset by money saved in a lower bond rate. The surety will also look for the financial statements to be arranged on a percentage-of-completion basis. This recognizes revenue and expenditures as a percentage of the work completed during the period and provides a more accurate financial picture.

3. Build & Tighten Up Your Balance Sheet

Work to grow working capital and corporate worth by passing on extra and excessive expenditures. The balance sheet provides an indication of how well capitalized the company is, what bond program it can support, and the company's ability to survive if a few projects go askew.

4. Open a Bank Line of Credit

From a surety perspective, it is advantageous to have extra liquidity even if it is not used. A contractor who has a line of credit in place and an added cushion presents a lesser risk than one who does not. The largest line a contractor can qualify for, the better.

A contractor's willingness and commitment to transition from a fast-track program to a standard program can increase their chances of securing greater surety support and winning larger jobs.

5. Present Evidence of Internal Controls

Having proof of strong internal control systems that track job costs, receivables, expenditures and inventory control is a sign of a successful contractor. Established protocols and documentation of jobsite inspections, change orders and contracts are also extremely important. In addition, having insurance policies, clear safety rules and employee incentives in place all add up to enhance the surety's perspective of the contractor.

6. Provide Detailed Information of Awarded Job

Despite taking all the aforementioned steps, the approval of a standard bond program, or more surety support, can come down to completing the bond request forms and required job information forms in their entirety and in a timely manner. Failure to complete forms may cause delays in the bond approval process, or bond approval denied. Bumping up against construction bond capacity can come as a surprise to many contractors as they bid on larger government projects to grow their business. A contractor's willingness and commitment to transition from a fast-track program to a standard program by completing these recommended tasks can increase their chances of securing greater surety support and winning larger jobs. ▲

**Under the Miller Act, construction bonds are a requirement for contractors providing services on federal projects over $100,000. Similarly, every state has its own "Little Miller Act" which specifies the contract amount above which construction bonds are required.*

Greg Angel, CPA, is a surety executive at Surety Bond Professionals (SBP), specializing in working with the SBA Surety Bond Guarantee Program. SBP is a bond-only agency based in Massachusetts with access to over 25 different surety markets, allowing for large programs and competitive terms for contractors. Visit suretybondprofessionals.com.



4 Strategies for Determining Whether a New Marketing Trend Is Right for You

How to analyze your options & ensure they fit your plan

BY JORDAN BUNING

In the early days of the internet, a number of aspiring furniture retailers decided to take their businesses online. The convenience of a virtual showroom was undeniable. But consumers who were trained to "try before you buy" simply weren't ready for it. Neither were some furniture makers. Retailers who envisioned the internet as a solution learned that it was, in fact, a problem in a competitive market. Many went belly up during the dot-com bust of the early 2000s.

Flash-forward to the COVID-19 pandemic when online shopping became commonplace across many sectors of the economy. Retailers who had already optimized their business model for e-commerce held a market advantage. Hindsight is 20/20: Pumping money into a virtual showroom was not an inherently poor business strategy for retailers, merely an idea ahead of its time when it was introduced a generation ago.



The phenomenon of chasing marketing's newest trends or "shiny objects" predates even the internet. Sometimes, being the first to embrace a new marketing trend can lead to enviable return on investment (ROI) and strong success. Other times, it can lead to wasted resources and the failure of a marketing plan, a career or a business. But how should companies discern risk and reward when it comes to adopting a new practice, device or technology?

The short answer: Any trendy tools you take on ought to fit within your overall marketing plan. Consider the following four strategies for determining whether the trend is a good fit for your organization.

1. Philosophical/Strategic Fit

If you can't close your eyes and imagine following a specific marketing strategy, there must be a reason. What is it about this shiny object, if anything, that undermines the corporate culture and identity you have worked to build?

The answer might be nothing. In that case, your hesitation might be strategic

The phenomenon of chasing marketing's newest trends or "shiny objects" predates even the internet. Sometimes, being the first to embrace a new marketing trend can lead to enviable ROI and strong success. Other times, it can lead to wasted resources and the failure of a marketing plan, a career or a business.

rather than philosophical. Consider whether following this trend amounts to what Amazon founder Jeff Bezos once referred to as a "one-way door" or a "two-way door."

One-way doors are irreversible decisions — impossible to come back from, inevitably a gain or a loss. Two-way doors are easy to reverse with a little time and effort. Bezos cautioned his shareholders in a 1997 letter to not to avoid two-way doors out of caution: "The end result of this is slowness, unthoughtful risk aversion, failure to experiment sufficiently, and consequently diminished invention."

Project a little. Look around the corner. Connect the events that are happening in your world. The risk might just be worth it.

2. Financial Fit

Of course, money matters when pursuing a shiny object. How much of an investment will it take? Can you afford to lose that?

Spotify CEO Daniel Ek once described his shift from a "thousand flowers bloom strategy" to a more conservative approach: "I believe in decentralized decision-making. So, I allowed a lot of things to happen without much involvement, just general context setting. We started hundreds of projects, but we didn't finish a lot of them. For many of them, my analysis ended up being it's the right thing to do, but it's the wrong time to do it. The sequencing was off. Plus, we didn't have the resources to fully do 100 projects at once. Now we have 10 bets going at any time, never any more."

Spotify, with a market cap in excess of $15 billion as of January 2023, can afford to take on more risks than most businesses — but even then, only to a point. If the ceiling of High-Risk Strategy A leads to an ROI not greatly above Conservative Strategy B running simultaneously, it probably isn't worth the cost regardless of your company's market cap.

If you're still sold on the merits of an expensive strategy, try corralling someone from your finance department to play devil's advocate with you. The dollars and cents might make your decision easier.

3. Tactical Fit

OnMoney.com spent millions on a commercial that aired during the Super Bowl in January 2000. The personal finance website bet on its ability to handle the resulting traffic, but when the advertisement aired the site was still labeled "beta." Within a year, the company had fallen victim to the dot-com bust.

As much as a financial misfit, the downfall of OnMoney.com suggests a tactical misfit as well. If the shiny-object marketing strategy succeeds beyond your most bullish projections, will your organization be prepared for the influx of business? If not, do you have a strategy to increase the collective bandwidth of your group in short order?

Consider also whether the marketing tactic is going to attract the kind of customers you desire. Does it truly target the audience you seek? Many marketing strategies have the potential to succeed; not all of these will align with your goals if they succeed.

4. Practical Fit

Marketers must consider other practical concerns when chasing a shiny object:

- Is the strategy right for a company your size? What works for a multinational goods supplier might not work for a local automotive parts dealer.
- If you scale the strategy bigger or smaller to suit your needs, will it still be effective? Put differently, are you using the marketing equivalent of a big gun when you should be using a surgeon's knife?
- Will the same strategy work regardless of the target region? A strategy that works with one regional audience might not land in a different region. A successful national marketing strategy might not work on a regional level.
- How are you going to operationalize it?

Keep in mind, too, that trendy strategies are fleeting by their nature. Even if your organization adapts a successful trend wisely, it might come too late to elicit the desired effect simply because the trend is no longer shiny. Conversely, the faster you adopt a new technology, the higher the risk. Cutting-edge or bleeding-edge strategies require a more complicated analysis, so take the time required (and not any more) to make a wise decision for your organization. ▲

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Smoothing the Road to Electric Work Trucks

Your guide to EV conversion & charging infrastructure

BY CHRISTOPHER LYON

Electric power is beneficial, but converting a fleet of work trucks to run on electricity is not as simple as flipping a switch. Producing a work truck is far from simple. These vehicles are often constructed in multiple stages and by multiple manufacturers. Converting from internal combustion engines to electric drive systems piles on the complexity.

Yet, whether due to the pursuit of improved cost, productivity, regulatory or sustainability outcomes, or some combination thereof, the work truck industry's interest in electric vehicle (EV) fleets is gaining traction fast. Most of these vehicles will be battery-electric vehicles (BEVs), meaning they are powered solely by batteries installed within the vehicle's frames that provide all the "juice" needed to drive the powertrain. Some EVs may be hybrids, equipped with both electric drives and (typically) gasoline engines for light-duty work, such as pickups.

While EVs may not be suitable for every work truck application, those that work from central depots, such as refuse collection and utility service vehicles, are excellent candidates for going electric. What's more, this green technology continues to advance as additional options for electric trucks become available and the batteries that make their wheels turn become more efficient.

Why Switch?

Electric power appeals to many fleet operators for several compelling reasons. These include the potential for EVs to do the following: deliver a lower total cost of vehicle ownership thanks to reduced fuel spend and lower maintenance costs; eliminate tailpipe emissions of greenhouse gases as required by federal and state regulations; help achieve corporate environmental sustainability goals; and, in many cases, enable quiet operation on urban streets and during overnight operations.

Because they are purpose-built for defined missions, work trucks are complex vehicles that require considerable engineering and overall effort by fleets and their suppliers to put them on the road. On the other hand, these job-specific trucks

are likely to deliver a much longer life cycle than mass-produced vehicles. The specific reasons why a particular fleet would consider shifting to lower-emissions vehicles — indeed, the bar now is as low as zero emissions — should be clearly defined and weighed prior to starting any EV conversion. Among the key considerations are:

- Lowering operating and life cycle costs
- Supporting energy independence
- Reducing energy costs
- Improving the fleet's public image

As bright as the electric future appears, shifting a single truck or an entire fleet to electric power takes a lot of planning. That starts with attaining leadership buy-in. From there, consider the electric ecosystem that will surround and support these work trucks. The next step is for the fleet to form cooperative partnerships with vehicle builders and their EV component suppliers, battery manufacturers, electric utilities and providers of on-site charging infrastructure.

Back to Basics

When communicating with these partners, be sure to define the fleet's drive cycle and duty cycle for each type of truck to be converted — these are the two pillars to define a work truck's mission and help determine how to accomplish that mission. Avoid the common pitfall of confusing the two.

The drive cycle defines how a vehicle is used, while the duty cycle defines how much a vehicle is used. These measurements are mutually inclusive, and both define how vehicles are utilized. They are equally important, especially when designing EVs and the infrastructure to support them. However, the measurements are vastly different. In simple terms, the drive cycle measures

Gear Up With More EV Resources

Wherever you are on the electrification journey, you can learn more during Work Truck Week 2023. Work Truck Week, North America's largest work truck event, will be held at the Indiana Convention Center in Indianapolis, Indiana, March 7-10, 2023.

Showgoers can experience a Green Truck Summit, attend educational sessions, check out the newest commercial vehicles, powertrains, equipment and components from leading manufacturers, and experience the industry's latest technology. For more information and to register, visit worktruckweek.com.



physical points, such as vehicle speed, starts and stops, idle time and power take-off (PTO) power export. On the other hand, the duty cycle measures the length of average operating time, operating cycles per period, total distance driven and percentage of loaded versus empty operation. Both measurements are crucial when considering all aspects of electrifying the fleet.

Engaging With Suppliers

Most vocational trucks are built in multiple stages by multiple manufacturers. While some fleets work with a single source — such as a fleet management company — that may provide a turnkey solution, others will interact with several partners, such as the chassis supplier, an auxiliary equipment supplier and an upfitter. While industry standardization keeps evolving, technology also continues to advance. Taking time on the front end to evaluate all options, from the capabilities of the electric drive system under consideration to how the truck batteries will be charged, can ensure that the final spec'd unit serves its intended purpose.

Following a methodical procedure and engaging the right people at the right time is critical. With almost every vehicle change, there are hidden and unanticipated costs and other challenges that creep up and can derail or significantly delay a vehicle spec'ing campaign. Don't overlook costs and prices beyond the power unit when planning. These could involve facility upgrades, technician training or operational requirements based on vehicle limits (range, towing, etc.). You may find that vehicle design is the easy part: Designing and installing charging and maintenance infrastructure can get complicated.

Charging Ahead

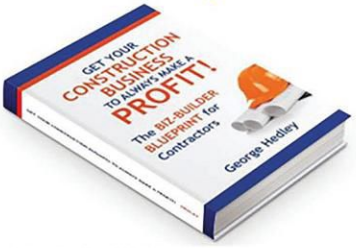
Many fleets, especially in the work truck sector, cannot rely on public infrastructure for fueling or charging. Therefore, it's critical to talk to the utility company about the supply of power available and how/if it can support the vehicles.

Next, develop a long-term plan for infrastructure. Just as making mid-build change orders on trucks or modifying them after delivery is expensive, planning for infrastructure will be much more cost-effective.

Charging infrastructure can be a very expensive afterthought. It's essential to plan not just for current needs, but for tomorrow's as well. This involves consultations, designing, permitting, constructing, managing and, finally, activating.

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Having the right partners lined up and communicating with them effectively is of the utmost importance. Diving deeper into charging with a utility and charging suppliers will reveal that most fleets need two types of charging solutions.

Depending on duty cycles, plan to install enough "overnight" or slow-charging stations so vehicles returned to their depot can be charged up steadily over a period of hours to be ready for their next shift, typically each morning.

To supplement this, a fleet may install a smaller number of "opportunity" or quick-charging stations that can rapidly top off the charge of a vehicle on duty to extend its range as needed. Light-duty fleets may also have drivers charge their vehicles overnight at their homes. This means they'll need a plan for installing chargers at their employees' homes and a reliable driver reimbursement system.

Bear in mind that it's the fleet's continuing responsibility to ensure that charging stations are installed to meet building and fire codes and are operated safely by trained personnel. In addition, work with charging suppliers so charging data will be collected and processed properly. This data can better inform management on the performance of EVs and their chargers.

Measuring Success

While EVs are a proven green solution, this shouldn't obscure the fact that no single technology is the only answer to cutting greenhouse gases and fuel costs.

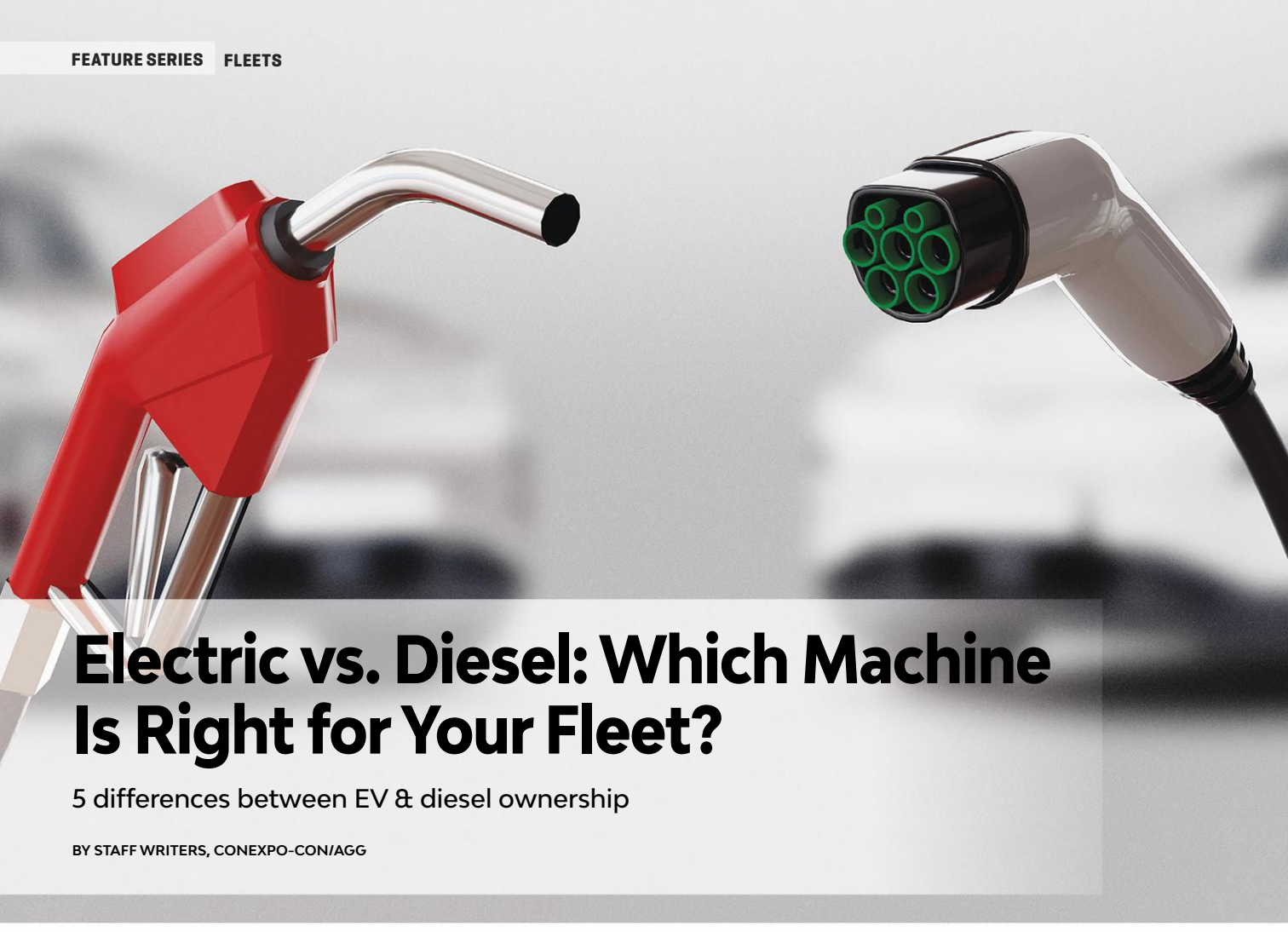
For a given fleet, the best option might include other advanced fuels and technologies, such as natural gas and propane engines or, further off, fuel cell power. And that's not to mention advances that may occur in conventional diesel- or gasoline-fueled powertrains.

In the end, vehicles need to perform specific tasks to meet organizational goals. While goals can differ by fleet, success means getting the commercial vehicle's job done effectively and efficiently. ▲

Christopher Lyon joined NTEA, The Association for the Work Truck Industry, in 2015 as director of fleet relations and Green Truck Association (GTA) fleet liaison. In this role, he connects distributors/manufacturers and end-user fleets while staying abreast of current issues impacting the fleet community. He also serves on the executive board of the Chicago Area Clean Cities Coalition. Visit worktruckweek.com.







Electric vs. Diesel: Which Machine Is Right for Your Fleet?

5 differences between EV & diesel ownership

BY STAFF WRITERS, CONEXPO-CON/AGG

Construction equipment manufacturers are embracing electric power. Most major construction equipment manufacturers have electric vehicles (EVs) in their current production catalogs. Some of this is driven by corporate decisions to decrease the negative impact when it comes to climate change and pollution, and some of it is driven to help their customers be more productive and profitable.

EVs don't produce any local emissions, so you can run them indoors where they replace manual labor, thereby increasing productivity. They also produce less noise, so they can be used in noise-restricted environments. And, since they can be used in more applications, owners of electric-powered construction equipment will be able to work on more and more diverse projects.

1 Demoing EVs

Casper Company, a concrete and demolition contractor based out of Spring Valley, California, owns six EVs — a fleet of Sherpa stand-behind skid steer loaders and Brokk radio remote control demolition machines — and for three months they demoed the Volvo L25 Electric compact wheel loader and the Volvo ECR25 Electric compact excavator.

The L25 Electric features the newest lithium-ion battery 48-volt (V) technology with 39 kilowatt-hour (kWh) capacity. It is powerful. It provides a peak electric motor driveline of 48 horsepower and peak electric motor working hydraulics of 43 horsepower. It features a breakout force of 12,252 pounds and a maximum travel speed of 10 mph.

The ECR25 Electric is a zero-tail-swing machine that features a battery voltage of 48 V, a battery capacity of 20 kWh, and a peak electric motor of 24 horsepower. It has a maximum dump height of 9 feet, 8 inches (with the optional long arm) and a maximum dig depth of 9 feet, 1 inch (with the optional long arm) and features a breakout force of 5,020 pound-force.

"We used them in pretty much every application we regularly perform," says Casper Company Equipment Demolition Superintendent Darrell Merritt.

"We used them in excavation applications, fitted the excavator with a hydraulic breaker, cutting out concrete with the

GET SMARTER ABOUT ELECTRIC CONSTRUCTION EQUIPMENT

WHAT YOU NEED TO KNOW ABOUT THE CHANGING EQUIPMENT INDUSTRY

Sustainability in the construction industry is being advanced by the public and private sectors. Governments are adopting more clean-air regulations at local and regional levels, and companies are adopting sustainability policies and asking partners to help them meet their targets.

Consequently, many manufacturers have already developed — or are in the process of developing — electric-powered construction equipment to meet increasing emissions regulations, provide efficiency improvements and lower operating costs. All electric, electric/hydraulic and battery-operated versions rival their diesel and gas counterparts in performance, notes Joel Honeyman, vice president of global innovation at Bobcat.

THE CHANGING INDUSTRY

> "PEOPLE SAY ELECTRIC MACHINES ARE NOT GOING TO PERFORM AS WELL AS DIESEL MACHINES," HONEYMAN OBSERVES. "THAT IS SIMPLY NOT TRUE. IN MANY CASES THEY CAN OUTPERFORM THEM."

> "MANY PEOPLE ARE SO USED TO WHAT THEY HAVE AND ARE AFRAID OF NEW TECHNOLOGY. SOME COMPANIES HAVE BEEN RUNNING DIESEL- AND GAS-POWERED EQUIPMENT FOR 40, 50 YEARS. HYDRAULICS HAVE BEEN ON EQUIPMENT FOR 80 YEARS. ADJUSTING TO AN ELECTRIC-POWERED MACHINE IS QUITE A PARADIGM SHIFT."

THE FUTURE

"We see electric-powered technologies and their applications spilling into our industry," says Honeyman. "Look at what is happening in the auto industry. Tesla has really driven the battery electric concept and an entire industry is shifting."

Green construction technology is only getting better and smarter with new machine and equipment applications and opportunities, he adds.

Among the many advantages of electrification, says Honeyman, are "noise and vibration reduction, instantaneous power, and software features that are otherwise unavailable with a diesel engine and hydraulics."

Matt Sagaser, director of innovation accelerated at Bobcat's Acceleration Center, adds that "the software features allow us to advance and accelerate the technology. We are doing it in a way that is more efficient and cost-effective, and beyond expectations from a power perspective. Overall, our electric innovations allow us to offer customers an experience they may not have previously imagined.

"We could have very easily removed the diesel engine and replaced it with a battery. Instead, our innovation team, which leads this project, wanted to see what other advantages we could achieve if we made it all electric and removed the hydraulics as well. That opened up a lot of possibilities."

Honeyman, along with Sagaser, will hold an education session — "Electrifying the Future: Get Plugged In" — at CONEXPO-CON/AGG 2023. They will examine the advantages of electric construction equipment beyond just being "green." They will also discuss what an all-electric platform allows construction equipment manufacturers to do. Catch their session by registering for CONEXPO-CON/AGG at conexpoconagg.com.

An electric engine has fewer components than a diesel engine, which means there is less to go wrong and less that needs servicing. There are no oil changes, no filter changes and no diesel exhaust fluid (DEF). Also, operators won't accidentally put diesel in the DEF tank or DEF in the diesel tank since there are no tanks.

loader, truck loading, grading, underground work to all things demolition."

There are only a few differences between owning and operating the electric version of these machines compared to their diesel counterparts. Both the electric and diesel versions can perform all the same functions and run all the same attachments without seeing a change in performance.

2 Scheduling Work

However, the first major difference is the recharging schedule of these vehicles, which can limit how much work they perform and impact your schedule.

"We got five to six hours of use out of the machines," says Merritt. "And every night we transferred them back to our yard for charging."

The L25 has an indicative runtime of up to eight hours (depending on application) and an off-board charging time of about two hours. The ECR25 has an indicative runtime of up to four hours (depending on application) and can reach 80% of a full charge in 50 minutes (both using the 400 VAC 32A charging system).

"Toward the end of the three-month trial, we hooked up a tow-behind battery, and then got eight hours of work from them," says Merritt.

The on-board charging time for the L25 is about 12 hours and the on-board charging time for the ECR25 is about five hours (both with the 230 VAC 16A recharging system).

3 Decreased Maintenance

The second major difference when owning EVs is the decreased maintenance. "We experienced no maintenance issues during the trial," says Merritt.

An electric engine has fewer components than a diesel engine, which means there is less to go wrong and less that needs servicing. There are no oil changes, no filter changes and no diesel exhaust fluid (DEF). Also, operators won't accidentally put diesel in the DEF tank or DEF in the diesel tank since there are no tanks.

4 Clean Energy Times Two

Electric energy is clean in two ways: It's better for the environment (depending on the energy source) and it is always free from contamination.

With EVs, you don't need to place orders for and then store large quantities of fuel for your fleet. And you don't have to worry about that fuel getting contaminated or ensuring it stays at the correct temperature.

Electric energy is always free from contamination, and it will never be wasted due to spoilage.

5 Plan for Fewer Workers

Since a lot of EVs can work indoors and other spaces where diesel machines can't work, these electric machines are often replacing manual labor.

"Our jobs demand EVs," says Merritt. "We work underground and inside buildings that are occupied, so diesel machines aren't an option. In these cases, we often work by hand, but there is a huge gain in productivity by using an EV. An application that takes one hour by hand, we can complete in just 20 minutes with an electric machine."

Conclusion

The Volvo L25 Electric and ECR25 Electric were demoed by not just Casper Company, but three other companies in various applications in different climates across the U.S.; the machines are expected to be available next year.

"Casper wants to be a leader in the future of EVs and when the Volvo electric models become available, we look forward to being the first to get one," says Merritt. ▲

The Association of Equipment Manufacturers (AEM) is the North America-based international trade group representing off-road equipment manufacturers and suppliers with more than 1,000 companies and more than 200 product lines in the agriculture and construction-related industry sectors worldwide. The equipment manufacturing industry in the United States supports 2.8 million jobs and contributes roughly $288 billion to the economy every year.

Held every three years, CONEXPO-CON/AGG is the must-attend event for construction industry professionals. The show features the latest equipment, products, services and technologies for the construction industry, as well as industry-leading education. The next CONEXPO-CON/AGG will be held March 14-18, 2023, in Las Vegas, Nevada. For more information on CONEXPO-CON/AGG, visit conexpoconagg.com.

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Understanding Excavators

6 factors to help structure your search for the right equipment

BY LUKE HILL

Excavators are more powerful, productive and durable than ever before. To keep up with their continued popularity, equipment manufacturers have introduced models that can be tailored to your specific needs. But with so many options, how do you select an excavator that's right for you?

If you frequently rent excavators or hire subcontractors who use them, look closely at the tasks they perform. This will help you anticipate what you need from a machine of your own. It's also important to think about how adding a variety of attachments to your excavator could create new business opportunities. To get started, consider the following factors.

1. Size, Weight Class & Tail Swing

Size is one of the most important specifications to consider when comparing excavator models. To get the most out of your machine, ask whether the desired excavator is the right size to perform the tasks at hand. Can it access your required jobsites? Can it achieve the expected performance regarding dig depth, reach and dump height? Your ideal excavator needs to be able to access your jobsites, and it needs to have the bucket size and lift capacity to do the work once it's there. Each jobsite demands different performance capabilities. If you work in confined areas like residential properties or commercial jobsites, every inch matters. Larger excavators can weigh more than 10 tons, so make sure your jobsite can accommodate the overall size and weight of a larger machine.

However, height, width and weight are only part of the equation. Tail-swing configuration is another feature to assess before committing to a machine. A zero- or minimal-tail-swing excavator of a given size will generally be wider than its conventional-tail-swing counterpart. If you anticipate routine work where you or your operators must pass through narrow property lines or gates, a conventional-tail-swing excavator may be a better fit.

The typical width of a conventional tail swing, such as a 3- to 4-metric ton compact excavator, is about 60 inches, whereas a zero- and minimal-tail-swing excavator with similar weight and performance will have a width of about 70 inches. Some manufacturers also offer a retractable undercarriage in select compact models when you need a machine that won't sacrifice over-the-side lift capacity for accessibility through tight entryways like fence gates and doorways.

2. Jobsite Limitations

As jobsites become more diverse, selecting an excavator that meets the jobsite is crucial. With the advent of electric excavators, operators can now take on work in additional areas.

Producing no emissions, electric excavators can tackle tough jobs on environmentally sensitive sites, as well as operate indoors, where engine exhaust is restricted. Because electric excavators offer significantly lower noise levels and vibration, they can also work in urban areas and other sound-sensitive jobsites where noise restrictions can limit work hours.

3. Arm Configurations

Standard arm configurations provide maximum breakout force and greater digging performance, while long-arm options provide additional reach without sacrificing much digging power.

Extra reach, combined with higher dump height, allows you to do more work without repositioning the machine and makes loading trucks easier. The long-arm option includes a larger counterweight to enhance your excavator's lifting capabilities.

If you need even more reach, some manufacturers offer an extendable arm option for select compact excavators. It offers the best of both worlds: power and lifting performance combined with the ability to extend the machine's dig depth and reach when you need it.

4. Power & Performance

Next, you should consider the specific tasks you need an excavator to perform. Smaller compact excavators can bring precision and power to confined areas, but they will offer less digging force and lower lift capacity than midsize compact excavators.

Larger models can accomplish more demanding tasks with powerful hydraulics and higher horsepower. At this stage of the decision-making process, pay attention to equipment specifications like rated lift capacity, digging force, dig depth and horsepower.

5. Comfort Features & Technologies

Operators spend a lot of time in the cab, so it's important to consider comfort features when adding an excavator to your fleet. Simple features like an enclosed cab with heating and air conditioning, low-effort selectable control patterns and overall ergonomics go a long way to creating a comfortable work environment.

An essential feature in the compact equipment industry is wireless communication technology — also referred to as telematics — which allows you and your operators to maximize uptime and provide better peace of mind. The technology uses electronic sensors to collect machine-specific data which is sent via wireless network to a mobile device or computer and can improve security.

With some of the higher-end display technology, you can adjust hydraulic flow and monitor on-board diagnostics, which will allow you to optimize uptime and serviceability. Select displays also provide Bluetooth connectivity, rearview camera display, attachment monitoring capabilities and operator productivity information.

Hydraulic activated systems allow you and your operators to save time and energy: Secure attachments within seconds by pressing a switch inside the cab to connect the machine's attachment.

6. Transportation Considerations

The weight and size of an excavator is just as important when you're not operating. Double check the load capacity of any vehicle and trailer you plan to use to haul your excavator before selecting a machine size. Due to their size, large excavators require different transportation equipment than compact excavators. If you are used to towing your compact excavator behind a pickup truck, you'll have to adjust your line of thinking when looking at an excavator in the 10-ton and larger size range. The size and weight of these machines call for a larger truck-and-trailer combination compared to a compact excavator.

In addition to securing the proper transportation setup, it's important to take weight-limited roads or bridges into account. If your equipment is over the weight limit, alternative routes may need to be considered. Each model is different, so it's important to confirm and check the weight against all legal requirements and acquire appropriate permits if needed.

7. Jobsite Demo

Above all, the best way for you to compare excavator models is to operate them on your jobsite. Not all excavators are created equally, and operating a machine in everyday situations goes a long way in helping you see how it would perform as a member of your fleet.

During the demo, be sure to examine the machine's versatility, operator comfort, ease of routine maintenance and, of course, performance, so you know exactly what to expect from your most recent equipment purchase.

The addition of an excavator could drastically improve your fleet's productivity and versatility. But before you buy, make sure you have considered all the factors involved, so you can find the best fit for you and your equipment operators. ▲

Luke Hill is an excavator product specialist at Bobcat Company. He has extensive knowledge in the excavator industry, and he's focused on offering customers the performance, comfort and precision needed to accomplish more on their jobsites. Visit bobcat.com.





How Your Equipment Maintenance Schedule Affects the Project

The importance of a robust preventive maintenance plan

BY BRYAN CHRISTIANSEN

Your choice of construction equipment impacts the amount of labor and time required to complete a project. It also significantly impacts the productivity of the jobsite. Consequently, it is vital not only to choose the appropriate construction equipment but also to use and maintain it appropriately. Regardless of whether you need to pave, drill, compress and grade, or excavate and load for your building project, you are obligated to use the apparatus in its intended manner.

Vehicles Used in Construction

Fleet maintenance is vital in construction. Fleet vehicles have the potential to be the most useful items you own and can go thousands of kilometers with appropriate maintenance. Adhering to state and national regulations — in addition to following fleet preventive maintenance schedules — can help keep all vehicles on the road.

- Once a month, check the gearbox, brake, wiper and power steering fluid. Also check the condition of the battery cables, belts and hoses.
- Every six months or 5,000 miles (whichever comes first), perform the following tasks: lubrication of the chassis, braking system inspection, tire inspection and rotation (depending on the manufacturer's requirements) and clutch system inspection for manual cars.
- Once a year, you should have the underbody cleansed, the coolant system serviced, the throttle control system checked, and the doors, latches, hinges and park brakes lubricated (look over the radiator, water pump, fan belt, thermostats, radiator cap and antifreeze).
- At least once every 15,000 miles, the automatic transmission needs a checkup and the transmission fluid and filter need to be changed (if applicable).
- After every 30,000 miles, the spark plugs, fuel filter, spark plug wires and engine timing should all be inspected.

Construction Equipment

Construction equipment, including heavy equipment used to move earth and other materials, will have a suggested preventive maintenance schedule provided by the manufacturer at the time of purchase. The schedule should be followed as closely

as possible to avoid equipment damage and failure.

Machinery Handling & Storing Equipment

Machine operators know how to operate and start a device, and they are familiar with its preventive maintenance checklist. They are aware of the tasks that need to be accomplished to guarantee the machines function correctly on a daily basis.

Operators can also recognize problems and point to certain components or subassemblies that may not be operating as they should be. Each piece of machinery will have its own preventive maintenance schedule which correlates to the date of purchase or installation.

Equipment Maintenance Affects Operational Efficiency On-Site

Up to 20% of construction company costs are attributed to construction equipment. Of course, that includes emergency breakdown work orders and parts. If you don't have replacement parts and rebuild kits on hand in emergency breakdowns, they have to be located and overnighted, costing time and hefty sums of money. Equipment maintenance costs escalate when machines break down and need emergency repairs.

A breakdown of vital construction equipment mid-project can destroy your project timeline and the relationship with your client if the situation isn't quickly remedied to the client's satisfaction. Needless to say, this type of pressure combined with a tight schedule can add unnecessary stress to your employees on-site.

Equipment Maintenance Enhances Safety

Unsafe equipment on a construction site can shut down a project quickly if there are injuries or accidents. In addition, missed inspections and unsafe equipment can also be grounds for the Occupational Safety and Health Administration (OSHA) or a state regulatory agency to shut down a project, causing huge penalties and fines.

Who will eat the cost of those penalties and fines? These costs cannot be billed back to the client. Any safety incidents or recordables will cut directly into the project's bottom line and any foreseeable profit margin.

Although regular equipment maintenance takes a chunk of time, it's much more beneficial in the long run. You'll save time by adhering to the needed protocols and sticking to maintenance schedules, as opposed to spending time on accident-related tasks and negotiation processes with regulatory agencies.

Equipment Maintenance Helps to Control Costs

Emergency parts fees are exorbitant. How will the company justify those costs? You can't bill emergency parts on equipment breakdowns back to the client. At the end of the day, the bottom line will take another hit under crippled equipment repair costs.

Poorly functioning equipment takes longer to run, and it doesn't do the job as well. This bleeds over into labor hours, which are another major cost center with any open construction project. In addition, those extra labor hours add stress to employees, which increases the opportunities for accidents and injuries. Overall, if the equipment isn't functioning as it was intended, productivity is going to suffer.

Take the Surprise Off-Site

It is much simpler to schedule a few hours for preventive maintenance and avoid these scenarios altogether. This will remove the element of surprise and ensure that all equipment on-site is running smoothly and efficiently. With a preventive maintenance program in place and equipment serviced to date, emergency breakdowns will become few and far between.

Your service technicians will give sufficient warning about equipment that has aged to the point of becoming problematic or unreliable in the field. More than likely, they could tell you the hours left in the life of the machinery, and the estimate would be pretty close in a lot of cases.

All equipment has a set life cycle. Once you exceed that life cycle or use the equipment without the proper maintenance strategy, you're taking your chances with proper operation as well as safe operation on the construction site. It is safer and more sensible to properly plan the maintenance and usage of your equipment and invest in new assets at the end of the current assets' life cycle.

Managing Construction Equipment Sensibly

In the broadest sense, construction equipment management may be defined as the process of analyzing the effectiveness of your company's fleet of construction equipment in light of the costs of ongoing projects. You are attempting to strike a balance between the operational expenses of your equipment and the deadlines and revenues resulting from the projects for which you have been contracted.

If you're in charge of a construction site, you need to know how to make sound financial choices about your machinery to maximize your profits. The ultimate objective is to have the apparatus generate sufficient revenue to cover its own costs and more. ▲

Bryan Christiansen is the founder and CEO of Limble CMMS. Limble is a modern, easy-to-use mobile CMMS software that takes the stress and chaos out of maintenance by helping managers organize, automate and streamline their maintenance operations. Visit limblecmms.com.



The Ongoing Evolution of Jobsite Connectivity

Inside tech's potential to integrate information for more efficient workflows

BY GREGG WARTGOW

The vision is there. Wouldn't it be great if the entire jobsite — the general contractor, subs, designers, owners, equipment vendors and material suppliers — were all working in sync with the data that shifts with each condition change, progress report, change order, telematics warning and machine inspection? If the right people got the right information at the right time to make informed decisions? This one-dashboard vision is much easier said than done. The journey of one equipment manager illuminates the roadblocks. Several years ago, Langdon Mitchell, equipment division general manager for heavy civil contractor Morgan Corp., needed someone to physically go machine by machine to update the software in his fleet.

The next big hurdle: each original equipment manufacturer (OEM) had its own proprietary telematics portal. Like most contractors, Morgan has a mixed fleet — getting a unified fleet view from all the disparate systems was clunky and time-consuming, Mitchell said.

The Spartanburg, South Carolina, company is now using a third-party product that amalgamates the information from each brand in the company fleet in addition to its rental equipment. "It's become a single source of truth," Mitchell said. "Beyond the raw telematics data, it's allowing us to have tools to have actionable items."

But more is needed, said Will Hipp, equipment data analyst with Morgan. "Our eventual goal is to have all the project managers on board so they can see the machines on other jobsites and identify any machines that have little utilization."

That involves getting dynamic project schedules to match up with fleet needs to pinpoint areas where the company has too many or not enough machines. "That is one of the biggest tasks we have: making sure that machines are in the right place at the right time," Mitchell said.

Jobsite Connectivity Is Complex

The Morgan Corp. story shows the information needs of one division of one company. Multiply those needs companywide, and then by all the entities with which that one company does business. Now add the industry at large and you get the idea of complexities involved. "It sounds pretty simple, but when you take a look at the disparate systems general contractors (GCs), subs, developers and agencies use, everybody has different formats and protocols so it's extremely convoluted," said Brian Juroff, senior vice president of sales-positioning solutions at Topcon Positioning Group.

"While jobsite connectivity is easy to define, executing it is a completely different matter. Every contractor has a different soup mix of software for office, modeling, scanning, etc. It becomes a huge hurdle."

"There's an immense amount of data that's created throughout the course of a construction project," said Patrick Stevenson, vice president of product management and platform at Trimble. "Jobsite connectivity is making sure that information is transferring to the right individuals at the right moment in time so they can more effectively do their job."

What's needed is a connective tissue that integrates fully with all pieces of information, creating a living, adaptive body of data. "It's providing a digital overview of what's happening on the site so everyone can easily make decisions," said Kenneth Veys, portfolio manager, uptime and connectivity at Volvo Construction Equipment.

The Jobsite Connectivity Boost

Overall technology infrastructure advancements like 5G networks, light detection and ranging (lidar) scanning, global navigation satellite systems (GNSS) and edge computing is laying the foundation for jobsite connectivity.

"I've been on jobsites in the past where at 2:30 p.m. you were going to lose connectivity based on satellite positioning," said Lonnie Fritz, senior market professional at Caterpillar. "You could set your watch to it. GNSS alone has really driven improvement in accuracy and reliability."

One of the biggest shifts is open architecture software so that data from different sources can be more easily integrated. "That's allowing a lot of contractors to embrace the concept of automating their processes," Juroff said.

While jobs in more remote areas still face connectivity issues, the amount of data that can now be transmitted has grown in the world at large. And there's a wealth of data that's waiting to be mined in a connected way, from machine telematics to design data to labor apps, said Jason Anetsberger, Komatsu's director of customer solutions. Connected machines can now receive updated design data, report back their productivity and the shape of the terrain as they create it.

Severino Trucking of Candia, New Hampshire, went to a cloud-based model

to reduce redundancy and disconnect, said Pat L'Heureux, project manager. "We have some crews that will take a project 80% of the way and then another group takes over. Everyone needs to have the same information."

Going to the cloud has been a "huge time-saver," reported L'Heureux. "I can now troubleshoot an issue in five minutes, where sometimes in the past it could take me three hours because of travel time."

And it's not just machines and production schedules in the data mix. Trackers, specialized hard hats and smart glasses are adding location, fall alerts and biometrics information on construction workers, leading to increases in safety and labor management capabilities.



Attitudes Have Changed

Contractor attitudes have also shifted, said Trimble's McLachlan. "We've seen a big jump in adoption of connectivity solutions," she said, "especially now that we can push a design update out to a machine remotely instead of having to drive out to the jobsite."

"Every year, the needle is definitely moving on the contractor technology adoption levels," Fritz said. "There's an increase in their belief of what technology can do to improve their operations."

The combination of grade control data with telematics reporting was a significant step forward, said James Leibold, product manager, connectivity, at John Deere: "You're not just having machines that report data, but you can remotely go into a machine and fix it."

The ability to not physically have to download job model revisions is critical, said Lyle Ballou, GPS manager for DXI Construction in Churchville, Maryland.

"We are managing 65 active jobs as we speak, and we have to manage the GPS info as different crews move in and out of different jobs weekly, sometimes daily." DXI Construction juggles the workload for 51 different crews in three different states, which necessitates being able to instantly connect and "program" each crew for the work to be performed.

"The investment we have made has eliminated not being able to work, because we have to wait for stakeout, or wait for a program to be driven to a job and downloaded," Ballou added.

What's the Right Solution?

One barrier to jobsite connectivity is the sheer choice of tech options out there, said Jim Bretz, connectivity services support manager at Volvo Construction Equipment.

"Customers don't know what to choose," he said. Fears about office and field data security are also valid.

"It's so fragmented right now there with the number of solutions," agreed Mitchell. "One company has a cool answer for one thing, and another company has a cool answer for another thing. How do you now bring that information into the whole so you can make decisions?"

"The different solutions can be siloed, which makes it hard to have cross compatibility," added L'Heureux. "If providers get too proprietary, it can hurt the end user."

Tech's Focus on Construction

"I love the attention the industry is now getting," said Anetsberger. "People are seeing that it's either ripe for digital disruption or that there must be an easier way."

Mitchell agreed: "What is exciting in our industry right now is how technology is really, really ramping up." Contractors will be able to piggyback on what's happening in the broader technology space. In addition to jobsite connectivity, these efforts will also lay the groundwork for autonomous machines.

But don't think jobsite connectivity will solve all problems, Bretz warned. "It's likely it will reveal more issues and create a whole new aspect of managing jobsites and machines because it opens up a lot of information that wasn't immediately available," he said.

"The connected jobsite concept is something I'm passionate about and I want to see grow," said L'Heureux. "It will help with the disconnect we see daily between companies, engineers, even internally. It will create more of a community if we can share this data." ▲

Greg Wartgow is a freelance writer, editor and public relations, communications and marketing professional with a passion for small business. He is a contributing writer for the Association of Equipment Manufacturers (AEM). Visit aem.org.





How to Ward Off Workplace Hearing Loss

A high-noise safety checklist for employers

BY RICK PEDLEY

The average construction worker may encounter any number of loud noises during a shift, but just how loud is too loud? Exposure to loud noises — especially over a long period of time — can cause permanent hearing damage, including ringing in the ears and partial hearing loss. Hearing damage, which is irreversible, can limit a worker's abilities and reduce their overall quality of life. But sounds also help workers orient themselves in the work environment. Reducing sound pollution can help protect everyone's hearing in the field. Loud noises may be commonplace in the construction industry, but business owners and managers are responsible for protecting workers from sounds that could damage their hearing.

If workers are exposed to more than 85 decibels (db) of sound for eight hours on a time-weighted average, employers must implement safety measures to prevent hearing loss, as required by the Occupational Safety and Health Administration's (OSHA) occupational noise exposure standard 29 CFR 1910.95. Hearing loss prevention can take many forms. Companies can use quieter equipment, set up sound barriers and ensure workers wear the proper hearing protection, such as earplugs and earmuffs.

Recognize the Risks

No two construction sites are exactly alike. Each project or jobsite presents unique risks and challenges that must be addressed before workers begin their first shift. The management team will need to measure the intensity, duration and frequency of the noises to which workers will be exposed on the job. The intensity is measured in decibels, the duration refers to how long the employee will hear the noise, and the frequency can either be stable, fluctuating, intermittent or impulsive. Managers can use a sound meter to measure the decibel level of these noises based on the worker's proximity to the sound. According to audiologists, irreversible hearing damage occurs when individuals are exposed to noises at or above 85 db for eight hours or more. The higher the decibel level, the sooner the worker will begin to experience hearing loss. The sound of city traffic alone is at a decibel level of 85, while a lawn mower may clock in at 90 db. Workers only need to be exposed to a lawn mower for 2.5 hours before they could begin to experience hearing loss.

Most of the equipment used in the construction industry is much louder than traffic or lawn mowers. In some cases, a worker may damage their hearing after only a few seconds of exposure. Power tools emit 110 db, and workers can only tolerate 1.5 minutes. Jackhammers and other heavy machinery produce 130 db, and damage can occur in less than one second. If workers exceed the safe

noise exposure limit, the company will need to take additional precautions to prevent hearing loss. The best option is to eliminate the loud noises by finding a quieter alternative, such as a newer piece of equipment. Electric motors tend to be quieter than those that run on fossil fuels. Proper equipment maintenance can also help reduce noise pollution. Construction crews should avoid using loud machines whenever possible to limit their effect on workers and the surrounding environment. If this is not an option, the company can set up sound barriers between the worker and the source of the sound or increase the distance between the worker and the source of the sound. For example, workers may be able to remotely pilot equipment to limit their contact with the sound.

Once all these options have been exhausted, the company can use hearing prevention equipment to protect workers. Hearing damage is cumulative. Workers bring a lifetime of noise exposure to the job. A preemployment screening for existing hearing loss may be prudent for those jobs where high-noise environments are expected.

Increase Employee Awareness

Hearing loss prevention requires both teamwork and individual responsibility. Every person occupying the jobsite will need to take precautions to protect their hearing. It's the company's job to inform workers of the potential risks and the importance of using hearing loss protection equipment. Managers should post "High Noise Area" signs in and around locations with loud noises.

Workers should receive training on how to use their hearing loss prevention equipment. The instructions may be verbal, written or both. A visual demonstration can help reinforce this information. The training must be available in different languages to accommodate workers of different backgrounds. Workers should feel comfortable coming forward if they have any questions. Workers should also learn to look out for one another on the job. Senior workers could mentor younger workers who may overlook important safety considerations. If a worker notices someone getting too close to a loud sound without proper equipment or lingering in the work area, the worker should remind them to wear appropriate safety gear or leave the jobsite.

Each worker should thoroughly inspect their hearing loss prevention equipment for damage before using it in the field. There shouldn't be any cracks or tears in the earplugs. Clean plugs regularly to prevent the buildup of bacteria. If they are damaged, they should be disposed of and replaced right away. Every crew should have multiple pairs of earplugs on-site in case a pair is missing or unusable.

The company should continuously review the merits of its hearing loss prevention program to ensure it is doing everything it can to keep workers safe in the field. Managers should always strive to use the best safety equipment for the task at hand to encourage employee compliance. New equipment models may also become available in the future, possibly reducing the need for earplugs and other preventive measures.

Choose the Proper Hearing Loss Protection

Companies have several options when it comes to protecting their hearing. There are different types of earplugs and muffs for virtually every type of situation.

Earmuffs are reusable and long-lasting. They can be worn with a headband, behind the head, under the chin or with a neckband. They can also be mounted onto other safety equipment, such as a hard hat or welding helmet. Earplugs come as two separate plugs. They will either fit into the ear canal or rest just outside it. The plugs are typically made with expandable foam or rubber that will adhere to the exact shape of a person's ear canal. They can be either reusable or disposable. Both can work well in various applications.

Reusable plugs are made with premolded layers that adjust to the shape of the ear canal. They can also be custom molded for each worker. Reusing plugs will help companies save money over time, but they must be maintained and cleaned after every shift. Disposable plugs must be thrown away at the end of each shift, as the expandable end will only work once. They are a great choice for those visiting the site temporarily, including zoning and safety inspectors, clients and investors.

Managers may want to invest in various types of hearing loss prevention equipment to give their workers multiple options. The earmuffs or plugs should fit comfortably on the person's head, neck or ear. They should be able to wear them for long periods of time without becoming irritated. Workers should still be able to wear all the necessary safety gear in addition to their earmuffs or plugs. Most earmuffs and plugs come in only one size, but workers should be able to adjust the length of the band for a better fit.

This equipment should be able to withstand the surrounding work environment. It should be able to hold under pressure while repelling sweat, dust, dirt and other airborne debris.

Everyone has the right to work safely without jeopardizing their hearing. Just a few seconds of exposure can lead to a lifetime of poor hearing. Construction teams should keep these considerations in mind when evaluating the potential risks of using loud equipment and machines. ▲

Rick Pedley, PK Safety's president and CEO, joined the family business in 1979. PK Safety, a supplier of occupational safety and personal protective equipment, has been operating since 1947 and takes OSHA, ANSI, PPE and CSA work safety equipment seriously. Visit pksafety.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.

JLG ▶

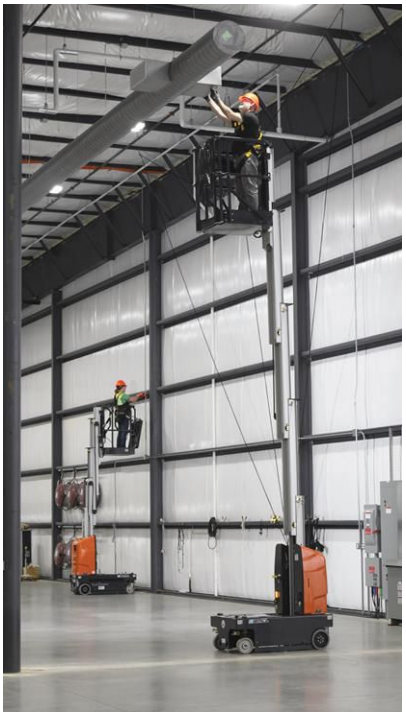
E18MCL vertical mast lifts

Released: 12/1/22

Availability: North American market

What's new? Equipped with long-running batteries, the model offers two times more duty cycles. Batteries are mounted under the platform with improved machine weight distribution for efficient loading and unloading. Features modern, ergonomic controls and an enhanced entry/exit from the platform. The quick-change platform system allows operators to efficiently switch platforms in one minute. There are five different platform options, including extension decks and trays.

Specs: Platform height is 18 feet indoors and 13 feet outdoors. The machine weighs 1,900 pounds when equipped with the standard platform. Engineered with a zero turning radius and 30% gradeability to provide maximum maneuverability in a lightweight machine. Compatible with the JLG Handheld Analyzer for on-site troubleshooting and equipped with the onboard Multi-Display Indicator that provides real-time information on the machine. Engineered with an improved roller system on the extension deck and reengineered mast guards to reduce the potential for debris to accumulate and hinder the operation.





◀ TAKEUCHI

TKB402-S hydraulic hammer

Released: 10/12/22

Availability: North American & European market

What's new? The TKB402-S works well with compact track loader models ranging from the TL6R to the TL12V2/R2 and compact excavator models ranging from the TB235-2 to the TB290. Providing excellent noise and vibration insulation, the sound-suppressed design protects it from dust and debris. Constant blow energy (CBE) allows for a wide range of oil flow settings and protects the hammer against high back pressure. An integrated, membrane-type hydraulic accumulator eliminates nitrogen leakage and the need to recharge for lower operating costs and consistent impact energy.

Specs: Features fewer internal parts and no tie rods, as well as a 3-in-1 lower tool bushing, for enhanced durability and simpler maintenance. A single retaining pin makes it easier and faster to replace the tool and tool bushing on-site when necessary. Swivel couplings allows hoses to move freely, reducing the load on both the hoses and hose couplings for longer component life.

JOHN DEERE ▶

200 G-Tier excavator

Released: 12/6/22

Availability: North American market

What's new? Easy-to-maintain, high-uptime exhaust filters help decrease downtime for service while the in-monitor adjustable flow and pressure auxiliary hydraulics can be controlled using the auxiliary function lever. The Powerwise Plus hydraulic-management system in 200 G-Tier combines ability with smooth control and pinpoint finesse. Offering precise pump flow, the pilot controls are metered, helping to provide reliable, fuel-efficient machine performance. With the push of a button on the joystick, operators can boost power and toggle on automatic boom-up and lifting functions.

Specs: Two factory-installed high-pressure, high-flow auxiliary packages deliver additional hydraulic capability to power attachments. Aimed to support operator ease of use, the ergonomically correct, short-throw pilot joysticks on the 200 G-Tier provide smooth, precise fingertip control with less movement or effort. The excavator can be equipped with a full line of buckets, which are offered to meet the needs of a wide variety of applications. The new hydraulic coupler-ready option includes factory-installed hydraulic plumbing to the end of the arm, additional coupler controls integrated into a switch in the cab and a quick and efficient coupler installation capability.





KEEN UTILITY

Independence insulated boots

Released: 12/1/22

Availability: U.S. market

What's new? Available in a 400-gram insulated style, the Independence offers an abrasion-resistant, supple leather upper, and performance, safety and comfort features. Includes a KEEN.DRY waterproof, breathable membrane for dependable dryness, Luftcell midsole infused with nearly 100,000 air bubbles per cubic centimeter for all-day support, and asymmetrical carbon fiber toes which are 15% lighter than steel.

Specs: The Independence series is also electrical hazard (EH) rated and features KEEN.Toughsole, an oil- and slip-resistant outsole that is lighter weight and more durable than rubber. Designed to perform and built for how you work, the insulated Independence will be available in a 6-inch and 8-inch silhouette.

DIABLO TOOLS

Diamond segmented turbo masonry cut-off blade

Released: 12/19/22

Availability: North American market

What's new? Diablo's diamond segmented turbo blades provide up to four times longer life than traditional blades and deliver maximum performance and high-speed cutting. Designed with minimal gullet space between their proprietary segments to provide the perfect balance between speed and cleanliness of cut.

Specs: The SPEED-Edge slot design aids in debris removal and reduces vibration and side friction, ultimately providing high cutting speeds that deliver up to 30% faster cuts than standard diamond blades. With a hardened blade body design, the blades deliver debris removal and superior quality cuts while providing a longer life than standard blades. The castellations on the blade help remove debris and keep the blade cool when cutting. The blades feature 60% taller segments containing quality diamonds, along with an ultra-durable bond to the blade body for extended blade cutting life.



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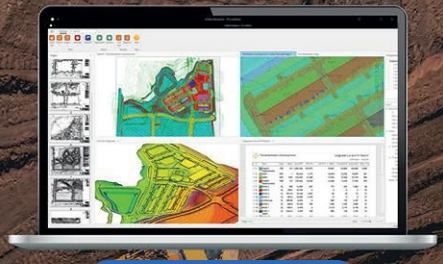
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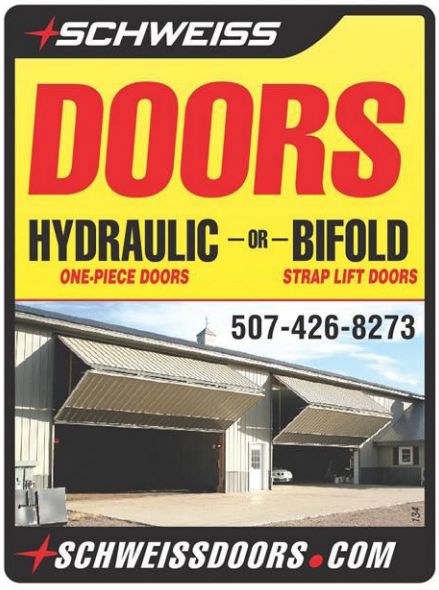


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▲ WESTERN GLOBAL

TransCube Global

Released: 12/5/22

Availability: North American market

What's new? The TransCube Global is a transportable, double-walled, cube-shaped fuel tank designed specifically for auxiliary fuel supply and efficient on-site refueling. The cube-shaped tanks feature 110% fluid containment and meet global transportation standards to provide safe fuel transport anywhere it's needed. Designed to improve jobsite efficiency, safety and profits. The features help end users take control of fuel supplies, extend equipment run times and avoid downtime associated with a depleted fuel supply. The tanks have feed and return ports to fuel as many as three pieces of equipment simultaneously, making them a versatile auxiliary fuel tank. A lockable equipment cabinet secures equipment ports and pumps to prevent unauthorized access and deter theft.

Specs: The tank's shape and design allow users to easily transport them on truck beds and trailers as well as in standard shipping containers. Unlike round tanks, the TransCube can be stacked up to three high when empty and two high when full, minimizing space consumption. The tanks were designed with four-way forklift pockets and reinforced corner brackets for lifting with a crane, resulting in added versatility when moving tanks around a jobsite. The TransCube Global is available in capacities ranging from 132 U.S. gallons to 1,242 U.S. gallons.

CATERPILLAR ▶

340 Hydraulic Excavator

Released: 11/8/22

Availability: Global market

What's new? A more powerful engine, wider track and 7.5-ton counterweight to increase productivity by 10% over the 2020 model year Cat 336. Its increased power and stability, combined with next-generation electrohydraulic system efficiency, make it a contender in the 45-ton class for moving tons per hour. Its reinforced structures ensure long-term durability in harsh digging, truck loading and hammer applications. Three engine modes match excavator power to the demands of the job while saving fuel: Power mode delivers maximum power to meet the most demanding tasks, and Smart mode automatically matches engine and hydraulic power to digging conditions to lower fuel consumption. Reducing engine speed to a constant 1,500 rpm, Eco mode minimizes fuel consumption.

Specs: Synchronized 1,000-hour oil and fuel filter service intervals reduce downtime. High-ambient temperature capability of 125 F, cold-start capability at 0 F, and the ability to work at up to 14,764 feet above sea level make the 340 suitable for virtually any environment. Auto hydraulic warmup in cold temperatures gets the machine to work faster and prolongs the life of machine components. The air intake filter with pre-cleaner features high dust capacity, and a high-efficiency hydraulic fan offers optional automatic reverse to keep cores free from debris. Product Link collects data automatically. Maximizing machine uptime, Remote Troubleshoot and Remote Flash allow dealers to remotely connect with the machine to diagnose fault codes and update operating software. Deluxe cabs come with a heated air-suspension seat, and Premium cabs come with a heated and ventilated air-suspension seat. Both have a tilt up left-hand console for easier access in and out of the machine.



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❑ 10 Construction – Special Trade Contractors
❑ 03 Highway and Street Construction
❑ 04 Water, Sewer and Utility Construction
❑ 05 Heavy Construction
❑ 06 Concrete Work
❑ 07 Excavation Work
❑ 08 Wrecking and Demolition Work
❑ 13 Architecture, Engineering and Construction Management Services
❑ 11 Consulting Contractor
❑ 99 Other (please specify)

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2. Your primary job title is: *(Check Only One)*

❑ 10 Owner, Partner, President, CEO, CFO, COO, Vice President, Director
❑ 11 General Manager, Manager, Foreman, Superintendent, Purchasing Agent, Controller, Accountant
❑ 12 Engineer, Architect
❑ 06 Consultant
❑ 99 Other (please specify)

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3. Approximate annual contract sales volume:

(Check Only One)

❑ 01 Less than $500,000
❑ 02 $500,001 – $1,000,000
❑ 03 $1,000,001 – $2,500,000
❑ 04 $2,500,001 – $5,000,000
❑ 05 $5,000,001 – $10,000,000
❑ 06 $10,000,001 – $20,000,000
❑ 07 $20,000,001 – $50,000,000
❑ 08 More than $50,000,000

4. Which of the following products/services are you planning to buy during the next 12 months?

(Check All That Apply)

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❑ 03 Compact Equipment
❑ 04 Lifting and Hoisting Equipment
❑ 05 Safety Equipment and Apparel
❑ 06 Attachments
❑ 07 Concrete and Paving Equipment
❑ 08 Survey and Site Prep
❑ 09 Compressors, Generators and Pumps
❑ 10 Financing and Accounting Services
❑ 11 Software and Technology
❑ 12 Insurance and Bonding
❑ 13 Training and Education
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Annual Value of Construction Put in Place

November 2020/2021/2022 Annual Rate Comparison

This chart compares the two previous years' total value of construction put in place to an annual forecast based on November 2022 figures. (Millions of dollars. Totals may not add up perfectly due to rounding.)

	2020	2021	2022
Total Private Construction	1,111,840	1,273,607	1,426,382
Residential	658,086	796,308	868,039
Nonresidential	453,754	477,299	558,344
Total Public Construction	347,600	352,275	381,123
Residential	8,904	8,991	9,332
Nonresidential	338,697	343,284	371,791
TOTAL Construction	1,459,440	1,625,882	1,807,505

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

$1,807,505

NOVEMBER 2022 TOTAL ANNUAL VALUE OF CONSTRUCTION PUT IN PLACE

"Given the slowdown in new project work, many architecture firms will rely on their near record levels of backlogs to support revenue," said AIA Chief Economist, Kermit Baker, Hon. AIA, Ph.D. "Still, firm leaders remain largely optimistic about future business trends. Almost two-thirds of architecture firms project that 2023 will be either a good year or great year for their firm."

AIA Architectural Billings Index (ABI)

National			*Regional - Billings				*Sectors - Billings			
Month	Billings	Inquiries	Northeast	Midwest	South	West	Multifamily Residential	Commercial/ Industrial	Institutional	Mixed
Jun-22	53.2	58.2	48.7	54.8	51.5	57.8	52.6	52.5	53.5	52.8
Jul-22	51.0	56.1	48.4	52.2	53.6	51.7	52.8	52.2	49.6	52.1
Aug-22	53.3	57.9	49.8	51.4	52.9	50.2	52.0	51.2	52.0	51.2
Sep-22	51.7	53.6	54.6	52.1	51.7	51.6	47.9	49.6	58.9	50.3
Oct-22	47.7	52.3	50.3	50.8	50.6	49.6	46.1	45.9	54.3	50.8
Nov-22	46.6	52.0	42.4	47.6	50.5	45.8	46.1	44.2	47.7	51.5

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

*Regional and Sectoral indexes are three-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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