

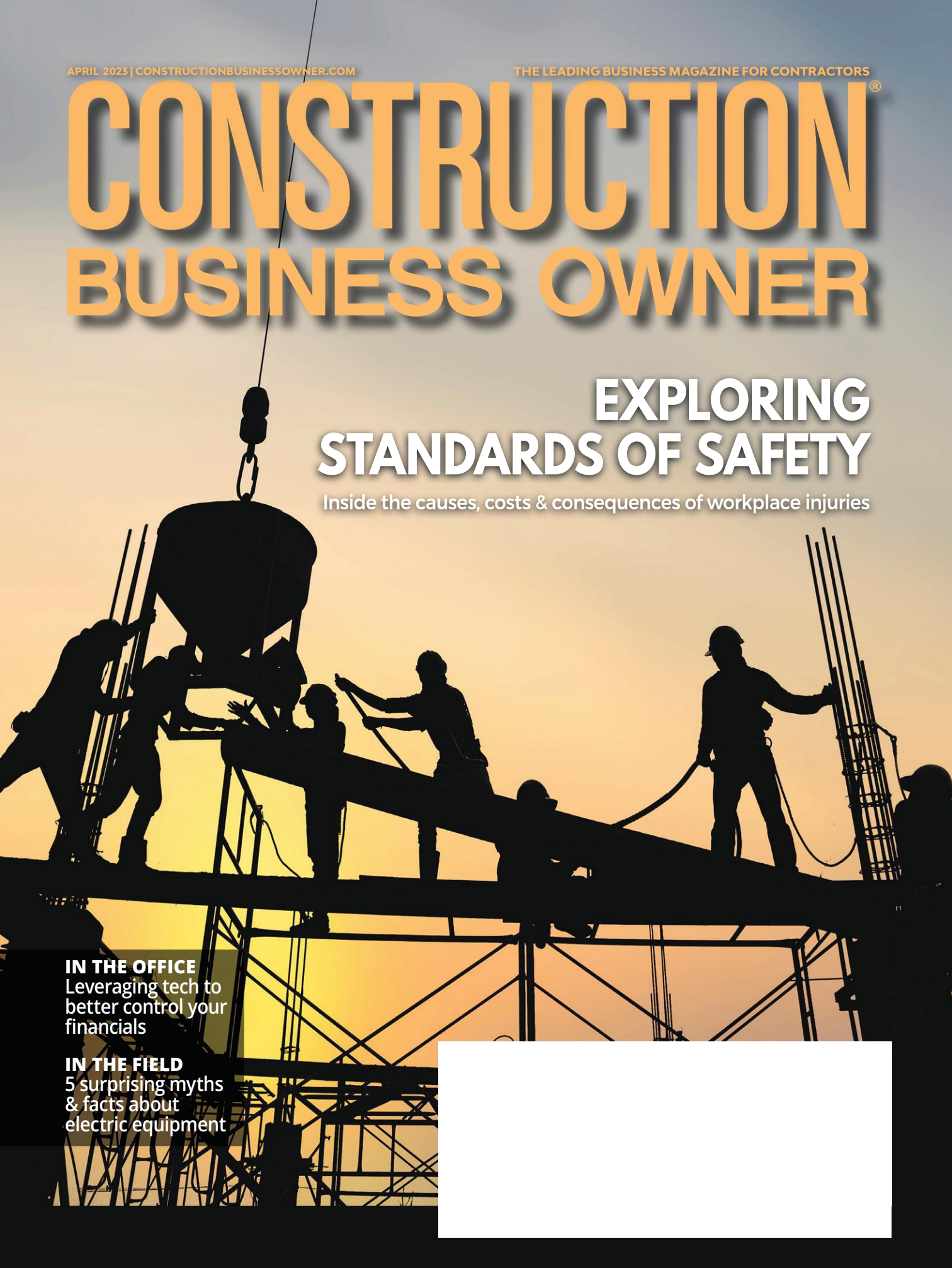
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THE LEADING BUSINESS MAGAZINE FOR CONTRACTORS[®]

CONSTRUCTION BUSINESS OWNER

EXPLORING STANDARDS OF SAFETY

Inside the causes, costs & consequences of workplace injuries

The background of the entire page is a photograph showing the silhouettes of several construction workers on a building site. They are working on a structure with scaffolding and rebar. A large concrete bucket is being lowered by a crane hook from above. The scene is set against a bright orange and yellow sunset sky, creating a high-contrast silhouette effect.

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FROM THE EDITOR

KATHY WELLS



Last month, the Construction Business Owner team (left to right: Greg Meineke, Kathy Wells, Carmen Capoccia, Van Imbragulo, Andrew Arnold) took on CONEXPO-CON/AGG 2023. Look for our post-show coverage, including industry insights, trend reports and more in our upcoming June issue and online at constructionbusinessowner.com/conexpo2023.

At print time, Associated Builders and Contractors (ABC) released an analysis of data from the U.S. Bureau of Labor Statistics' most recent Job Openings and Labor Turnover Survey (JOLTS). The study reports that construction industry job openings fell sharply in February — down 240,000 on a monthly basis and 148,000 from the same time last year.

Like many with a close eye on unemployment, ABC Chief Economist Anirban Basu called the data "simply shocking," noting that the total number of job openings economywide hit 10.8 million at the end of January. "[This means that while] there are still nearly two job openings for every unemployed American, the number of construction job openings plummeted from 488,000 in December to 248,000 just one month later, according to the JOLTS report," Basu said. "In other words, almost one-half of all construction job openings disappeared in a single month. In a nation that is set to rebuild much of its infrastructure and is operating in the megaproject era, including the construction of manufacturing facilities for computer chips, inputs to growing alternative energy industries and electric vehicles, [these] numbers seemingly defy credulity."

If you're wondering, "What is going on here?" you're certainly not alone. Basu believes there may soon be revisions to this data, or perhaps some additional information that might provide reasoning to support this extreme turn. Until then, what are we to make of this? Is there still a shortage of labor in construction? The short answer: yes. However, if these numbers hold, there may be hope on the horizon. Readers, please send your thoughts on the subject to kwells@cahabamedia.com — I would love to see things more clearly from your perspective.

Take good care,

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Construction Business Owner (ISSN 1551-3246) is published monthly by Cahaba Media Group, 1900 28th Avenue South, Suite 200, Birmingham, AL 35209. Periodicals postage paid at Birmingham, AL and additional mailing offices. Subscriptions: Free of charge to qualified construction business owners. Publisher reserves the right to determine qualifications. Annual subscriptions: U.S. and possessions \$48, all other countries \$125 U.S. funds (via air mail). Single copies: U.S. and possessions \$5, all other countries \$15 U.S. funds (via air mail). Call 800-256-2785 inside or outside the U.S. Postmaster: Send changes of address and form 3579 to Construction Business Owner, PO Box 271, Lincolnshire, IL 60069-9835. ©2022 Cahaba Media Group, Inc. No part of this publication may be reproduced without the written consent of the publisher. The publisher does not warrant, either expressly or by implication, the factual accuracy of any advertisements, articles or description herein, nor does the publisher warrant the validity of any views or opinions offered by the authors of said articles, descriptions or any advertisements. Submissions: We welcome submissions. Unless otherwise negotiated in writing, by the editors, by sending us your submission, you grant Cahaba Media Group, Inc. permission by an irrevocable license to edit, reproduce, distribute, publish and adapt your submission in any medium on multiple occasions. You are free to publish your submission yourself or to allow others to republish your submission. Submissions will not be returned. VOLUME 20 ISSUE 4



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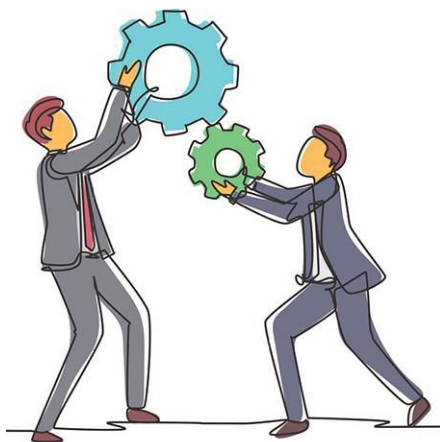
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► Hino Trucks Announces New President & Operational Alignment



Glenn Ellis

Hino Trucks announced the appointment of Glenn Ellis to the position of president and chairman of the board for Hino Trucks. Ellis succeeds Shigehiro Matsuoka, who retired after holding the position for four years. Ellis will also serve as an officer of Hino Motors Limited, Hino Trucks' parent company. In his most recent role as senior vice president (VP) of customer experience, Ellis focused on expanding Hino's dealer network and product offering to include zero-emissions trucks while continuing to grow Hino trucks' market share. As president, Ellis will continue to focus on the dealer and customer relationship. Hino Trucks also announced several other organizational changes as part of its overall restructuring to support widening product options and growth in the U.S. Bob Petz, who previously served as senior VP of vehicle and parts sales, is appointed chief operating officer and executive VP. In addition to product development, all sales, parts and service operations will report to Petz in his new role. John Donato, previously VP of parts operations, will take over as senior VP of sales and marketing. Visit hino.com.

► Yanmar CE & ASV Officially Join Forces to Become Yanmar Compact Equipment North America

Yanmar Compact Equipment North America (YCENA), encompassing the Yanmar Compact Equipment and ASV brands, finalizes its status as a single legal entity. The major milestone comes three years after the Yanmar Group acquired ASV Holdings Inc. Now, the Yanmar Compact Equipment division in North America and ASV officially join to become YCENA. Yanmar CE and ASV have operated as YCENA from a commercial standpoint since July 2020. The alignment as a single, legal entity allows for a better, more capable and dedicated compact equipment entity focused on leadership in the North

American compact equipment market. It will also allow a wider range of compact equipment offerings long-term, offer a single way for compact equipment dealers to do business with YCENA and strengthen the global Yanmar Compact Equipment team. The Yanmar CE and ASV brands will remain distinct under YCENA with each brand retaining its product lines and dealer networks. Currently, Yanmar Compact Equipment offers mini excavators, compact wheel loaders and tracked carriers with a focus on commercial construction, residential construction, utility and rental applications. ASV offers compact track loaders and skid steers popular in the landscaping and forestry markets. Visit yanmarce.com and asvi.com.

► Mi-T-M President Sam Humphrey Retires After 32 Years



Sam Humphrey



Rick Stanley

The Mi-T-M Corporation announced that long-time president and board of directors, Sam Humphrey, will be retiring effective June 1, 2023. Humphrey has been with the company for 32 years, with 27 of those years as president. Humphrey will stay on the board of directors until his term expires. Humphrey has played an instrumental role at Mi-T-M and has helped guide the company through many milestones, including new equipment introductions, numerous business partnerships, a facility expansion spanning over 1 million square feet, customer growth and becoming an employee-owned company. As Humphrey steps down, the Mi-T-M board of directors has appointed Rick Stanley to serve as the new president and CEO of Mi-T-M. Stanley is a seasoned leader and has held many executive positions with large national companies including Liberty Diversified International, Flexsteel, Brunswick and Whirlpool. He has 28 years of corporate management experience and will work side by side with Humphrey

Kenworth Turns 100

In 2023, Kenworth begins a yearlong celebration commemorating its 100th anniversary and contributions to the transportation industry. The history of Kenworth began in 1923 when Harry W. Kent and Edgar K. Worthington incorporated the Gersix Motor Company as Kenworth. That first year, the small Seattle truck manufacturer produced 78 six-cylinder, gasoline-powered trucks. Since then, Kenworth has produced more than a million Class 5 to Class 8 models and super heavy-duty trucks. Kenworth also now produces medium- and heavy-duty battery electric vehicles. Visit kenworth.com.

until June. Mi-T-M Corporation is an employee-owned manufacturer of industrial equipment, located in Peosta, Iowa. Visit mitm.com.

► Pittman Joins Wright as Human Resources Manager



Heather Pittman

Wright has announced Heather Pittman as its new human resources manager. In her role, Pittman will handle recruiting, benefits, safety and training and development. Pittman's strong generalist HR background prior to her new role include the positions of HR manager with ST Engineering, and senior HR partner with Arconic. Pittman holds a bachelor's degree in business administration from Strayer University. She is also a member of the Society of Human Resources Management. Wright manufactures a complete line of more than 4,000 professional-grade hand tools for the industrial, contractor, and maintenance, repair and operation markets. Visit wrighttool.com.

► Bobcat Company Announces \$9.3M Investment in Automated Press System at North Dakota Manufacturing Facility

Bobcat Company has completed a \$9.3 million investment in punch press automation and press technology at its manufacturing facility in Gwinner,

North Dakota. The new press line, which recently began production, is expected to more than double press production capabilities, reduce energy consumption, lower noise levels and improve complex forming for sheet metal parts. The company also invested an additional \$1.2 million for entrance and building upgrades at the Gwinner location. Bobcat partnered with AP&T North America Inc., a provider of advanced production solutions, for the fully automated tandem line, which includes design and build of the new 2000 Ton Valveless Servo Hydraulic Lead Press at the Gwinner facility. The highly automated, closed-looped, valveless servo-hydraulic press is 70% more energy efficient than a conventional hydraulic press. The press also provides increased productivity and superior forming capabilities, which enables the pressing of more intricate and complex designed parts, along with shorter cycle times. The press line and automation are smart controlled via internet-based solutions. Visit bobcat.com.

► **Holcim to Acquire Duro-Last Roofing Systems**

Holcim has signed an agreement to acquire Duro-Last, a U.S. provider of commercial roofing systems. Duro-Last has a track record of double-digit growth in North America's highly profitable roofing market, driven by premium brands, proprietary technologies and custom-made solutions. Duro-Last's systems will complement and strengthen Holcim's integrated roofing offer, with expected synergies of \$60 million per year. Duro-Last is recognized for its leadership in innovation and sustainability. Its research and development (R&D) organization is continuously expanding its range of proprietary technologies and custom-made solutions for superior performance. At the forefront of sustainability Duro-Last's systems range from cool roofs and insulation boards to enhance buildings' energy efficiency, to its award-winning "Recycle Your Roof" program, driving

circularity in roofing. Duro-Last's systems are in line with the most advanced green building certifications, such as Leadership in Energy and Environmental Design (LEED). The transaction is expected to close by early Q2 2023. Visit holcim.com and duro-last.com.

► **Swinerton Announces Bonnie Pfleiderer as Director of Business Development for Northeast Market**



Bonnie Pfleiderer

Swinerton announced Bonnie Pfleiderer as director of business development for the Northeast market. Her primary area of responsibility is to build strategic relationships and to create and implement a marketing and development plan to increase business and revenue. As director of business development, Pfleiderer is responsible for developing strong partnerships and lasting relationships with new and existing clients, as well as seeking out new business opportunities for Swinerton in New York. She has a deep understanding of clients' needs and priorities and focuses on not only meeting expectations but exceeding them. Swinerton provides commercial construction and construction management services throughout the U.S. Founded in 1888, Swinerton is 100% employee owned. Visit swinerton.com.

► **USDA Officials Tour New Thunder Creek Equipment Expansion at Iowa Manufacturing Plant**

Thunder Creek Equipment and its parent company, LDJ Manufacturing Inc., hosted officials from the United States Department of Agriculture (USDA) at its newly expanded manufacturing plant in Pella, Iowa, on Feb. 1, 2023. The company added more than 25,000 square feet of new manufacturing space to handle growth in demand for its products in the construction and agricultural sectors — made possible by a \$1.5 million loan through the USDA Rural Economic Development Loan and Grant Program and the Pella Cooperative

Electric Association (PCEA). The program provides 0% interest loans to rural utility providers, such as PCEA, that in turn relend the money at zero-percent interest to businesses within their communities. Thunder Creek Equipment manufactures a full line of field fueling and service products for the construction and agricultural industries, including trailers and truck-mounted solutions. Attendees included Under Secretary for Rural Development, Xochitl Torres Small; Theresa Greenfield, the USDA State Director for Iowa; Doug Stewart, CEO of PCEA; and other representatives from state and area economic development groups. Visit thundercreek.com.

► **Komatsu's Chattanooga Manufacturing Facility Begins Production of HM400-5 Articulated Trucks**

Komatsu has begun producing the company's HM400-5 articulated haul trucks at its factory in Chattanooga, Tennessee. While the trucks were produced in Chattanooga in the mid-2000s, in 2009 production shifted to the company's plant in Ibaraki, Japan, where it has remained until now. Used primarily in construction, quarry and mining applications, the HM400-5 is designed to move material across challenging terrain while delivering productive, consistent performance for operators of all experience levels. Additionally, the new line will offer more opportunities for area students to gain experience in manufacturing. The Chattanooga plant currently has a pre-apprenticeship program that employs high school seniors part time, allowing them to earn credits toward a full apprenticeship certification through Chattanooga State Community College. The plant also produces midsize hydraulic excavators and intelligent excavators, as well as some machines for the forestry market. Visit komatsu.com.

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Insight from industry aces & answers to construction's biggest questions

ASK THE EXPERTS

What accounting problems are you facing this year, & how are you solving them?



Richard Harvey
Vice President
ICS Commercial LP

// When I first started out in the construction industry, I thought I had everything under control. But, as projects started to pile up, I soon realized that I was in over my head. I was manually tracking expenses, revenue recognition was a guessing game, and I was constantly worrying about cash flow. And to top it off, I was struggling to stay compliant with tax laws.

That's when I decided to take action. I did some research and discovered software solutions that would make my life easier. I started with job cost tracking. QuickBooks Contractor Edition and Buildertrend were the two options that caught my eye. And let me tell you, my life has never been the same. These software options automate the process, providing real-time insights into project profitability so I could focus on the build and leave the accounting to the experts. Next, I tackled revenue recognition. This was always a challenge for me, but with Procore and AIA Contract Documents, it's a nonissue. These software options analyze contracts and determine the appropriate recognition of revenue, so my financial reports accurately reflect my financial position. Cash flow management was another challenge, but Xero and WorkflowMax came to my rescue. These software options provide real-time visibility into payments, expenses and other financial transactions, so I can proactively manage cash flow and avoid financial difficulties. Finally, I tackled compliance with tax laws. TaxJar and Avalara integrate with tax laws and regulations, ensuring that I'm in compliance with all relevant tax requirements. These software options make it easy to keep up with tax laws and regulations, giving me peace of mind.

My journey has taught me that accounting doesn't have to be a burden. With the right tools, you can solve common and difficult accounting problems and focus on what you do best — building. These software solutions automate key processes, provide real-time insights and ensure compliance with tax laws, making it easier for you to manage your finances and make informed decisions. With the right tools, you can tackle even the toughest accounting challenges with confidence and take the stress out of accounting. //



Christopher Gagliardi, CPA
Partner
Janover LLC

// As a certified public accountant (CPA) to the construction industry, what keeps me up at night is thinking about companies that do not maintain a solid work-in-process (WIP) schedule. Whenever I talk to a new company and they say they do not really keep track of their WIP, I know this is a problem. If this is the case, we discuss why they really need to ensure they are tracking their jobs in a timely manner. I discuss with them some effective and efficient tips to assist, such as ensuring all job costs are coded correctly in their accounting system, as well as keeping up with a process to make certain that estimated costs are used. In addition, we discuss various technologies and automated tools that make keeping track of their WIP in a timely manner very easy to do. //

What's your take?

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How to Expect, Demand & Achieve Excellence

Advice for laying the right groundwork & getting out of the way of your employees



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.

In baseball, achieving excellence means hitting over .300. In golf, it means shooting par. In the construction business, it means winning more than 33% of your bids and making a minimum of 5% to 10% net profit. Are you achieving excellence in your business?

To achieve excellence in the construction business, companies need a written business plan that focuses on hitting goals and implementing strategies to continually improve, innovate and move to a higher level of success.

When I ask contractors what their typical bid profit margin is, they might estimate 10%. But their income statements often indicate they've only made 3% net profit. When asked why their margin has declined, they say things "just seem to always happen."

It's like they expect to make less money and miss their goals. The same contractors refuse to accept responsibility for these poor profits and are unwilling to take measures to improve.

In order to achieve excellence and get what they want, business owners must:

- Get unstuck, get organized and systemized, and gain back control.
- Scale up and move to a higher level of leadership, sales and professionalism.
- Become recognized as the best provider of construction services in their market or niche.
- Implement a business plan to build a

highly profitable business.

- Develop a strong management team accountable to run their company and achieve results.
- Implement a process to win high-margin contracts with loyal customers against less competition.
- Build a great place to work that attracts and retains the best talent available.
- Create an accurate estimating system with no missed items.
- Stop profit margin fade and projects finishing late or over budget.
- Start building a portfolio of investments.

Start Expecting Excellence

If you accept results and performances that are less than excellent, you will never build a business to deliver the results you want to achieve. Many owners and managers tolerate poor performance and poor performers as the norm. Rather than deal with issues, they avoid conflict with their employees and hope things will get better. Last week, I coached a construction client who told me his employees were terrible, even though most of them had been with him for five years or more. They were not hitting their goals, getting work done on time or doing quality work. They always blamed their issues on others, including bad bids, poor subcontractors, lack of supervision or nasty customers. He didn't know how

to solve this issue, hold his employees accountable or fix the problem.

Hold People Accountable & Demand Excellence

Perhaps you think your people don't care or don't want to work any harder. The real reason is their boss — perhaps you don't demand and expect excellence. Performance is the result of the leader's and manager's input. Your input equals their output. Most employees want to do a good job and take on more responsibility. But in many cases, overworked managers who are understaffed or unorganized are afraid employees might quit, so they tend to tolerate poor performers rather than deal with them.

As I probed deeper with my client, I discovered he made all the important decisions for his crews, ordered the material, didn't have field meetings with them and didn't share job targets or results with the foreman. No wonder his crews weren't accountable achieving results. They didn't know their goals, weren't making any decisions and weren't in charge of their own work plan.

What Is Excellence to You?

When I help contractors improve their companies, we first identify the issues to be fixed. Then we define what an excellent result would look like. Then we design a system to ensure excellent results will happen on a regular basis. The top indicator of achieving excellent results is a clear understanding of what's expected. Excellent contractors require implementation of must-have systems, such as the following, to achieve results:

- Accurate estimates with no missed items.
- Estimators review every completed job and then update their cost history based on actual performance.
- No callbacks, extra mobilizations or punch lists.
- Crew foremen know their labor hour

budget and get an update weekly to stay on budget.

- Field labor budget versus actual finishes within 2% of the budget.
- Change orders are approved in writing prior to starting extra work.
- Crews are not sent to jobsites without a supervisor ensuring it's ready.
- All subcontracts and major material orders are awarded within the first three weeks of jobs starting.
- All shop drawings, selections and approvals are submitted within the first month of jobs starting.
- Contractors walk jobsites with subcontractors one to two weeks prior to when they are needed to make sure they're ready and have the crew and materials scheduled.

What Are Your Standards of Excellence?

There's never an excuse for a crew to run out of materials or supplies on their job. But it happens. So, how can this problem be fixed? The solution is to require crew foremen to draft two-week look-ahead schedules every Friday and have their supervisor or project manager walk the job with them early next week to make sure nothing is forgotten. The bad news is that most contractors don't want to invest the time required to make this simple solution a priority, therefore causing many jobs to finish late. To maintain excellence, the boss must hold their foremen accountable.

When bad bosses give someone a task to accomplish, they typically don't let go of every decision required to accomplish the job. This bad boss delegates and then tells the employee to check with them first before making any decisions or spending any money. How can the employee be accountable for something they aren't responsible for? People know when they make decisions, you'll second-guess and overrule them. So, people stop making decisions or accepting responsibility.

Trusting people is the key to improving performance and achieving excellence.

Low Control, High Performance

Leading your company is not about being in control of every aspect of the operation: It's about getting results through people. Low control guarantees high performance from people. People want to follow leaders who trust them. So, your role as a leader is less about what you do, and more about what your people do.

Excellent managers encourage employees to take on more responsibility by delegating the entire task. Start by explaining the job and outlining the desired result. This will teach employees how you want things done and what's expected. Next, make sure they know their boundaries and standard systems, offer training, set interim check-in times and schedule a review of the results after the task is completed. When employees are responsible for results and know exactly what's expected, you can make them accountable.

When you have written company systems and standards, you can make employees accountable to complete tasks the same way every time. When your procedures are only in your head, you can't expect employees to read your mind and get it right every time. And to make things worse, when you ask people to do something and then get upset when they do it wrong (without clear understanding of what was expected), they shy away from taking on more responsibility.

The More You Do, the Less You Make

So, what's holding your company back from achieving excellence? Perhaps you're the real problem if you tolerate poor performers and results, and you don't hold people accountable for their actions. Decide to achieve excellence by holding people accountable, demanding performance and expecting results. ▲

The Foundations of Operational Excellence (Part 1 of 3)

Developing & implementing preconstruction processes for a successful project



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.

Many engineering and construction (E&C) firms measure success strictly by looking at the bottom line. If net profits are good, companies often think they're effectively managing their money, processes and talent.

In a great economy, profitability can provide firms with a false sense of security. The challenge is that it can be unclear whether managers and supervisors are making decisions that truly drive profits due to the use of effective internal processes, tools and metrics, or because current market conditions are favorable.

In a strong market, companies that believe they are already operationally superior have scant incentives to review existing processes, training and other areas for improvement. Yet these companies might be relying on the work of a handful of talented executives, project managers and other staff members to produce results. A firm that is truly operationally superior can utilize less experienced managers and continue to deliver exceptional results. Additionally, these firms have the training, processes and systems in place to help employees grow and succeed.

This article is the first in a series about creating operationally superior organizations across the entire project life cycle. Part 1 focuses on the development and implementation of preconstruction

processes that will create a defined game plan before people show up to a jobsite. Ultimately, having a more prepared workforce prior to mobilization will lead to greater jobsite productivity and enhance the bottom line. Being organized can also help retain your talented managers since they have the tools, processes and procedures to be successful — no matter the job.

Building a Strong Foundation Through Rigor & Standardization

Companies must ensure their operations are ready for any market conditions and can withstand employee turnover in key positions. With labor shortages at an all-time high, we see that companies with well-defined internal processes that are replicable, sustainable and scalable are the most likely to retain quality employees. This is because workers at these companies have the necessary structure or parameters in place to be successful at their jobs.

A good starting point is to implement a system of continuous review and improvement. Be rigorous about standardization throughout the company. It is important to be consistent and to include the right people in these conversations. You will need an operations director or someone with equivalent responsibility to lead this change management initiative, but frontline staff

should also have input into developing standard systems and procedures.

Operations directors need to be able to examine the organization and ask the right questions. A few questions to kick off an improvement initiative include:

- What is going well in the organization? What is lagging?
- Where can we make improvements to the company?
- What processes are working? Where do we need to collaborate to streamline operations? Who should be involved in these conversations?
- What tools do we currently have available?
- How effective are they? What could be added to improve efficiency or ease of use?
- What processes should we standardize, and where should we allow for creativity?
- How do we hold people accountable for following standard processes?
- How are we training people on these processes throughout the firm?

A Strong Start Sets the Tone

Preconstruction typically runs from when the project is awarded until the project breaks ground. For contractors that engage in design/build or design/assist delivery types, a preconstruction strategy should begin earlier during the concept or design phases.

FMI has identified several processes that operationally superior organizations use during preconstruction, which result in better outcomes during construction.

Collaborative Discussions

Preconstruction planning is more than a handoff, and any exchange of project information is simply a starting point for discussions.

For many clients, the preconstruction meeting is a brainstorming session where owners dictate orders, and the responsibility is passed to the contractor.



Too many companies think of this as a checklist to speed through. It ought to be considered as the beginning of job planning and paramount to the overall success of a project.

Operationally superior construction firms guide their clients through the process and approach preconstruction as a collaboration. With a strong internal plan, construction organizations can work more effectively with clients and drive conversations centered around risk management and mitigation from all aspects. The checklist is there to guide the conversation, but it should encourage collaboration and real conversations about how to solve challenges and deliver the project on schedule and on budget.

Preconstruction Planning Tools

Preconstruction planning utilizes a tool to create follow-up and uncover potential issues. Many believe that purchasing planning software or other tools is all that is needed to improve efficiency. They fail to consider how best to use tools and at what specific point in the process to do so. Tools can provide incremental improvements and must be regularly evaluated and improved. Examples include meeting agendas or presentations, which

may help mitigate risk and identify challenges from the onset, allowing project teams to derive effective solutions prior to mobilization.

The best approach for implementation is to create a road map for how your company should use productivity tools and methods for holding people accountable. Too often clients spend millions on software, but they don't put enough focus on how to utilize it.

Ultimately, they don't reap any tangible results. The tool utilization road map is meant to drive accountability in the same way that exercise apps on a smartphone help drive personal accountability in fitness.

All processes should be standardized so they are repeatable across the organization.

Stand-and-Deliver Phase

One element of preconstruction planning is the stand-and-deliver phase, where the project team explains its plan, approach or strategy to senior management, and leaders provide objective counterpoints to challenge the team's approach.

This step should occur after client handoff and all the necessary team preparations. Estimators, project

managers and the superintendents will put together this plan and present it to a panel of senior leaders. Stand-and-deliver meetings provide the ultimate backstop prior to mobilization and help mitigate risks long before they occur.

Additionally, this is the time to identify any potential challenges and to evaluate means and methods to generate greater efficiencies. Any areas of risk should be closely examined, discussed and solved during this process. Senior management should be objective about the team's approach and point out any flaws in the team's initial plan or in any risk assumptions.

Preinstall/Trade Kickoff Meeting

Before a trade partner begins, a general contractor conducts a preinstall or trade kickoff meeting to review project-specific items such as quality assurance or quality control, labor, safety procedures or other areas. Most importantly, this meeting occurs at the jobsite with each trade partner's field leader.

Trades don't always have the full picture for how their specific scope of work fits into the overall project. For example, a general contractor might call a drywall specialist and schedule this crew for a particular day.

If the contractor doesn't review the required application processes or discuss the trade partner's strategy for the installation, the partner may end up covering up walls where other trades have not finished or not provided the owner's desired finish level. Both can result in costly budget or schedule overruns.

Great contractors don't just go through the motions with these meetings. They use the time to collaboratively plan and coordinate the specific scope of work. Even if trade partners aren't doing their own planning (which they should be), preinstallation conferences ensure contractors have their trade partners' full attention and that the entire job is well

organized from the beginning.

It is important to be consistent when handing off scopes of work to trade partners. More specifically, all processes must be clear and standardized so trade partners know what is expected of them. Having efficient and clear processes on your project usually attracts quality trade partners that will prioritize your jobs over your less organized competitors, and it often results in better pricing.

As the general contractor, you must also help set the strategy for efficiency; basically, you are the best source for planning and coordinating to make sure everyone is on the same page. Collaborative planning ensures each job is started in the same manner, no matter the project location or project manager.

Legal Knowledge

Everyone must understand the general contract and the terms and conditions therein. No one needs to be an attorney; but a fundamental knowledge of the operations-specific terms and conditions is paramount.

The best companies ensure project managers and other leaders have solid foundations in construction legal knowledge. You can achieve this through training, lunch-and-learns or on-site seminars. One tip is to create a one-pager so everyone on the project team understands the general terms and structure of the contracts.

Standardization in this area is also key because subcontractors need consistent language and terms to work with. Only the scope of work should vary. This ensures project managers understand timelines, notification deadlines and other contractual obligations spelled out in the contract.

Exit Strategy

Each project needs an exit strategy or preconstruction planning for the last 10% of the project.

The premise of the exit strategy is to plan and strategize for the successful and efficient completion of the last 10% of the project. This is even more critical if there are (or will be) changes to the project team. At this point in the project, the project team collaborates to develop a realistic, consistent management philosophy to drive the project over the goal line.

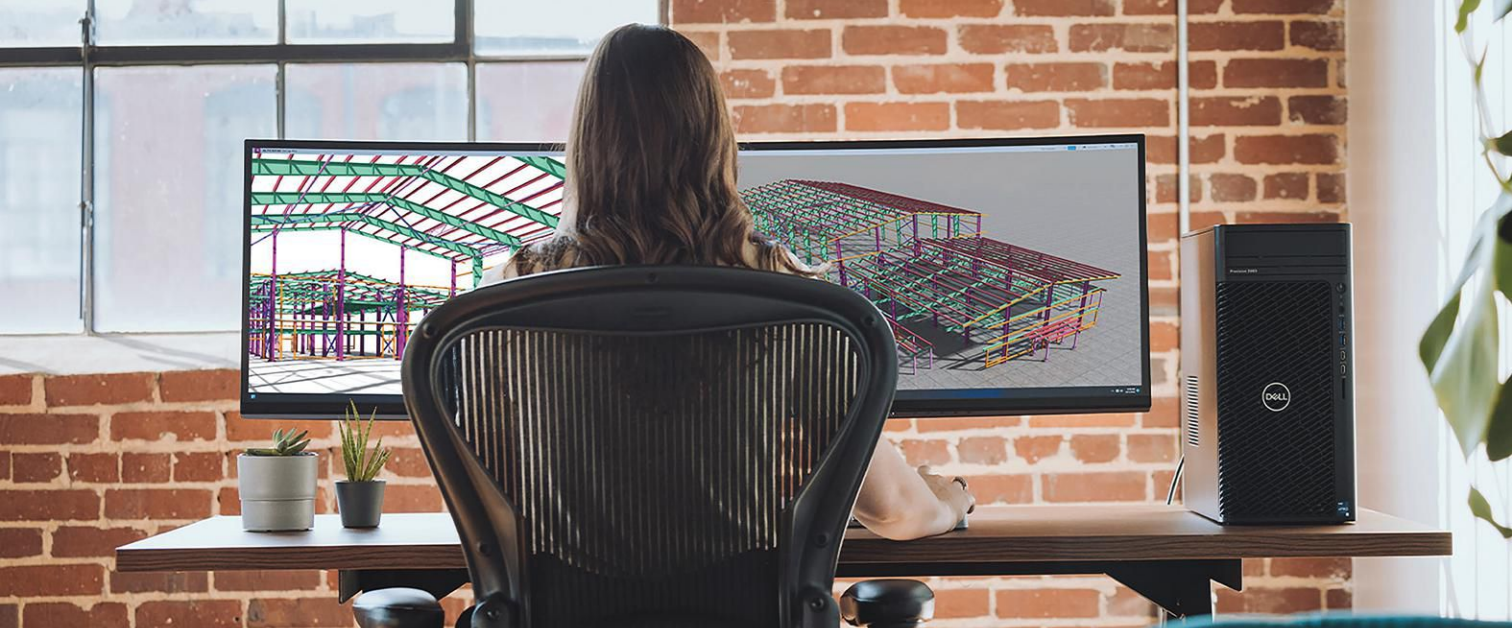
Items that must be considered and planned for during the exit strategy process include anything that could prevent the team from finishing the project profitably, such as creating the punch list, gathering operations and maintenance documents, commissioning critical equipment, training the owner on systems, documenting as-built construction, obtaining owner buy-in and handing off the project.

Many companies in our industry are terrible at executing these last parts of a project because they lose focus, and the resources that were on the project from the beginning have been reassigned to newly mobilized jobs instead of completing the one at hand.

Why It All Matters

Every job starts with preconstruction, which is the foundation for project success. Operationally superior organizations understand that having consistent processes, documents, tools and approaches to each project before mobilization can have a tremendous impact on their efficiency and margins. Improving this area helps save time, avoid project rework and foster clear communication across the project team and with trade partners.

Contractors that continually focus on improving their operational procedures and processes will reap the rewards of these efforts. Even small tweaks to existing processes can make an enormous difference in your company and help to retain your top talent and clients. ▲

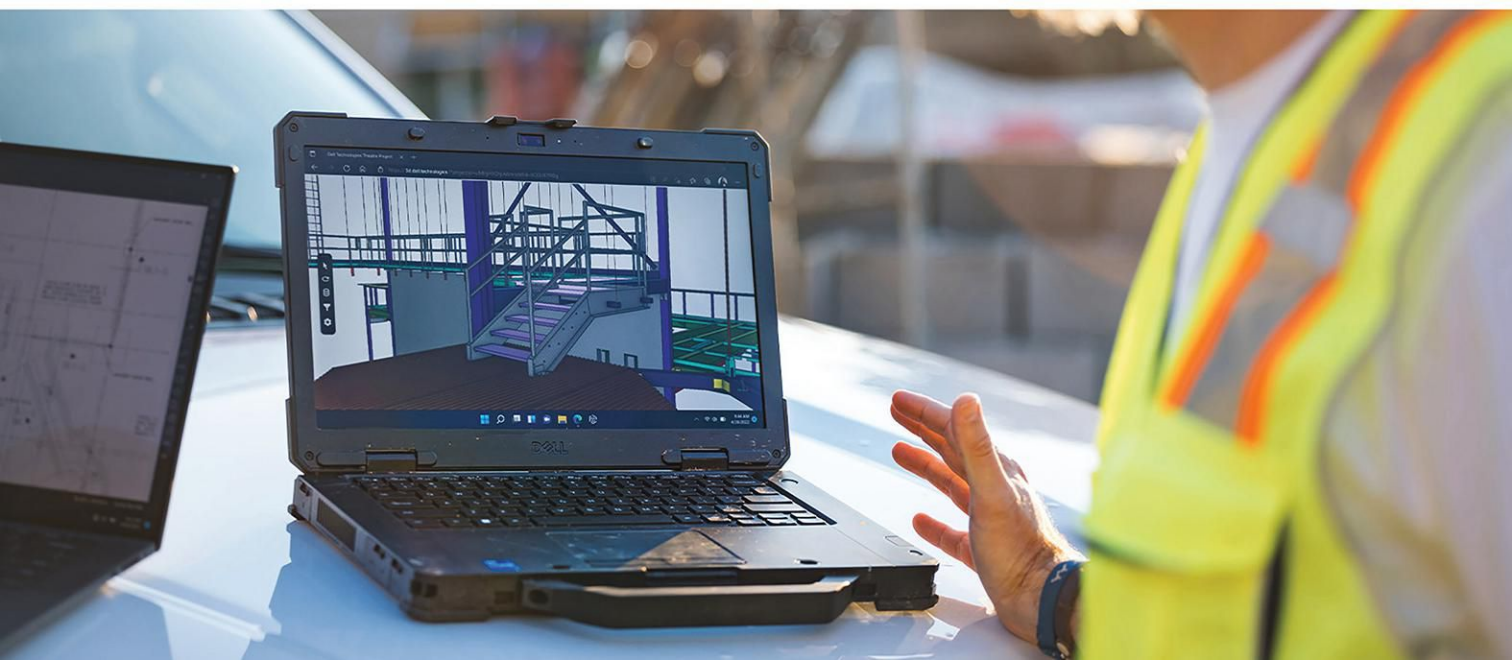


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Pandemic Problems & Possibilities Facing Contractors

Examining the impact of COVID-19 on the construction industry



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The COVID-19 pandemic brought about one of the most challenging periods in the history of the construction industry. Lockdowns, supply chain breakdowns and financial struggles wreaked havoc, causing existing projects to be delayed and new projects to be restructured. At times, managing supply chain interruptions and trying to keep a healthy cash flow seemed nearly impossible. These factors made planning for future growth more difficult.

Now contractors have a unique opportunity to incorporate the lessons learned throughout the pandemic to be more resilient and profitable in any circumstance. The following will reflect on the most significant pandemic-related developments to affect the construction industry and the lasting impacts they may have on industry practices.

Project Delays

Looking Back

Project delays were a significant hurdle during the early days of the pandemic. With completion deadlines and delay clauses, contractors faced financial penalties and damages where their contracts didn't specifically state federal shutdowns or pandemic-related disruptions as excusable factors for delays. In fact, contractors bringing COVID-19-related impact claims are having trouble in court. The projects may be back on track, but recouping delay penalties and related legal fees has proven tough.

Looking Ahead

Contractors wary of a COVID-19 resurgence or similarly disruptive event may want to reinforce the language in their contracts to protect against large-scale shutdowns and other major disruptions outside of the business's control. To date, companies seeking to compel insurers to cover pandemic-related losses by claiming coverage under damage or suspension clauses have been largely unsuccessful. In the future, success compelling an insurer to issue reimbursement might depend on the addition of language specifying coverage for federally mandated shutdowns.

Supply Chain Issues, Material Costs

Looking Back

When countries implemented lockdowns, the shutdown of nonessential businesses caused supply chain issues, which in turn increased material and labor costs. Jobs bid on and awarded prior to the pandemic used now-obsolete pricing, causing reduced margins and profits across the board. With nowhere to pass the cost increases, contractors needed to dig into their own pockets to cover these overages. At the start of the pandemic, material costs for sand, bricks, lumber and cement increased significantly as a result of limited availability. In May of 2021, lumber prices alone had increased six to seven times their annual average, according to MacroTrends. These figures have since returned to reasonable levels. However,

these prices are still one-and-a-half to two times their pre-pandemic levels. Not only are material costs increasing, but the cost to land these materials is rising as well. Labor shortages are compounding the issue, with some companies having trouble finding the resources to deliver the materials in a timely manner.

Looking Ahead

Most contractors didn't have an escalation clause in their contracts to cover the steep increase in material costs. While some contractors were able to renegotiate existing contracts, not all were successful. This led to contractors going out-of-pocket and eating into already razor-thin margins. To mitigate the impact of future pricing volatility, consider incorporating escalation clauses and delay provisions into project bids and contracts.

Larger construction firms went so far as to order excess materials to lock in favorable pricing. Of course, caring for that material requires suitable storage facilities and shipping capabilities. Certain specialty businesses with limited material needs and suitable in-house fabrication capabilities might find this strategy of bulk ordering effective going forward, but equipment costs could prove a barrier. For example, a painting contractor buying paint months or years in advance would need to also be able to mix materials to each project's specifications in-house.

Labor Shortages

Looking Back

With material prices back down from all-time highs, contractors are attacking their backlogs only to find they're short of the skilled labor necessary to complete the work. Labor shortages introduce their own issues, including delays in project completion, quality control concerns and increased overall job costs. According to an analysis conducted by Associated Builders and Contractors

(ABC), the construction industry needs approximately 650,000 more workers to keep up with the pace of current work. Labor shortages are forcing some contractors that typically perform work themselves to turn to subcontractors. Prior to the pandemic, studies showed that more contractors were leaving the industry than entering, and construction's aging workforce is a major problem, considering younger employees don't yet have the technical skills or experience to keep up with demand. It is estimated that the number of construction workers dropped 8% over the past decade. And, with 1 in 5 workers older than 55, senior workers are approaching retirement with no clear indication that younger generations are prepared to step into their shoes. This skill gap was exacerbated by COVID-19 and will persist until younger generations enter the construction industry and gain the necessary skills.

Looking Ahead

In response to a tight labor pool, the industry has taken steps to encourage young people to enter the profession and incentivize existing employees to stay on. That's driving increases in wages and broader benefits packages throughout the industry. In addition, industry organizations are promoting the benefits of trade school and encouraging companies to develop relationships with high schools, participate in career fairs and streamline hiring practices. Finally, some construction firms are restructuring with hiring and retention in mind. Employee stock ownership plans, for example, are making a resurgence as an ownership structure rewarding long-serving employees with equity.

Financial Struggles

Looking Back

Contractors continue to work through the financial struggles that arose at

the beginning of the pandemic. As project delays caused financial strain on contractors, supply chain issues drove up the price of materials, and labor issues created more financial tension than ever before, contractors focused on taking safe cost-cutting measures. Since the pandemic started, there has been a larger focus on balance sheets and cash flow management as companies look to cut unnecessary costs.

To help offset some costs, federal aid was made available to businesses in the form of forgivable loans and tax credits. The most popular of these were the Paycheck Protection Program (PPP) loans that businesses were eligible for as long as they kept employees on payroll during the pandemic. The Employee Retention Tax Credit (ERTC) was another major aid and allowed qualified businesses up to \$28,000 per employee in tax credits. These helped struggling businesses get back on their feet and maintain a healthier cash flow. With this money drying up, contractors are again focused on cutting costs and increasing margins where they can.

Looking Ahead

While programs like the PPP are unlikely to return except under extraordinary circumstances, the 2022 infrastructure bill promises billions in as-yet unawarded construction spending. Some firms are reviewing the bidding requirements for this work to best position themselves for future awards. As budgets are slashed, falling material prices should be kept in mind to avoid unnecessary cuts.

While the last few years have proven difficult, it's important to recognize that the industry is rebounding, and companies are carrying the lessons of the pandemic forward. Overall, positive long-lasting change appears imminent, particularly for those eager to evolve. ▲

The Intersection of Tech & Culture

Why construction execs need a holistic approach in 2023

BY BRUCE ORR & BRIAN RIGGS

With 2023 well underway, millions of Americans are still pursuing their New Year's resolutions by hitting the gym, counting calories and otherwise pursuing the promise of transformation. These goal-setters might even include a few construction executives who want to ramp up company performance in 2023.

But whether the vision is to get in shape or run a more competitive contracting firm, the effort will likely fizzle if it is merely one-dimensional.

Lifting weights to shed pounds is a fine idea, but if you stay up until 2 a.m. bingeing Netflix, you're more likely to wake up hangry and reach for the carbs. In the resulting sleep-deprived sugar crash, you'll probably skip your next date with the bench press.

Along the same lines, a construction CEO could resolve to bring the company into the 21st century by rolling out a new cloud-based technology platform. But without simultaneously encouraging a supportive shift in culture and behavior, that effort could fail. Maybe a micromanaging chief operating officer (COO) refuses to give others the latitude to use the platform, or perhaps field personnel keep on scribbling notes instead of using their tablets to enter data in real time.

So how can contractors chart a more holistic path to transformation and set in motion a mutually reinforcing upward spiral?

Contracting firms can identify key areas of growth by having honest conversations among different internal

and external stakeholders. The effort should include not just technical, financial and project-specific domains, but also cultural dynamics related to morale, communication and behavior.

Taking a more conscious approach is important because the many stressors in construction make it more likely that team members will default to unskillful, habitual patterns of behavior. Those stressors include being under the gun to stay on time and on budget; the headaches associated with managing subs and suppliers; the need for vigilance around safety and regulatory compliance; and even mundane worries about bad weather, change orders or whether you're living up to others' expectations.

3 Key Domains

To ramp up the growth of both people and profits, construction company leaders would do well to ask questions around three fundamental domains:

1. *Vision* — Have key decision-makers ever sat down to formulate a clear vision for where the company is headed? Have they shared that vision and sought feedback on it from the rest of the team? Are individual executives, accountants, project managers (PMs), supers and engineers clear on why the company exists and does what it does?
2. *Strategy* — Let's say everyone is on the same page about the vision. Is the go-forward strategy for achieving it just a fuzzy intention, or is it concrete enough to measure, track and analyze in the form of key performance

indicators? Is there broad-based buy-in for the movement toward organizational change, or are resistant holdouts — people who cling to “the way we've always done it” — standing in the way?

3. *Leadership* — Do high-visibility leaders walk the talk on vision and strategy in an equal way, or are employees getting the sense that “This is really Jane's agenda”? Consistency of behavior is just as critical as clarity of message.

When It Comes to Tech, the 'How' Matters

General and specialty contractors across the country are increasingly interested in using technology to close the gaps between the office and the field. But how construction companies go about rolling out technology matters tremendously.

Siloed approaches involve announcing the change, offering some training and hoping that any resistant holdouts will get with the program.

Holistic frameworks consider the full intersection of people, processes and structures. That means identifying, addressing and reformulating any out-of-step elements of company culture. (For example, a department that refuses to rethink its clunky and error-prone reporting methods, or an internal team that defaults to the position of “This is our territory. Stay out.”)

It's equally important to build a culture in which office and field personnel use the new platform for shared dialogue, goal setting and progress tracking. The team should see technology as part of the organization's cultural fabric — not a “take it or leave it” capital expenditure offered by management. In a siloed approach, for example, a lone project manager hits budget-projection milestones and quietly records the progress in the analytics platform, uncelebrated. In a holistic one,



the human resources team notes those achievements, celebrates them and scores a talent-retention win in the bargain.

Be Transparent

Some leaders struggle with transparency. But when organizational change is an all-hands-on-deck effort, leaders want stakeholders to be aware of their specific contributions to project and financial performance. Customizable data visualizations and dashboards can allow leaders to be selective about the information they share, but the goal should nonetheless be to give people the data-driven insights they need to excel at their jobs.

Holistic leaders also are bullish about all forms of training and education — not only in traditional domains like technology, safety compliance and financial management, but also in the fundamentals of habit and behavioral change, stress reduction and other areas related to personal growth.

Instead of saying, “We expect you to work differently,” they might frame it this way: “Here’s how we’re going to prepare you to work faster and more effectively.”

The executive team should give careful thought to the cues, reactions and rewards needed to catalyze behavioral and attitudinal change. Take the case of a PM who needs to update the billing

status of a particular project. The cue here would just be the need to run that report. At this point, the reaction could be a temptation to default to old habits: “I used to do it in my old spreadsheet and then email it to accounting.”

But if company leaders have anticipated this behavioral loop, they will have already emphasized to the PM the importance of using the new platform to keep accounting and other stakeholders updated in real time. Leaders may even have publicly celebrated other PMs for embracing the new approach, creating stronger incentives for everyone to get on board.

Aware of this, the PM now drops the old habit and focuses on the reward: “They will be stoked to see me use this new system. Let’s give it a go.”

Communicate the ‘Why’

In a holistic approach, leaders and their teams move the needle on organizational change by paying attention to multiple domains at once, from skillful approaches to construction data and talent retention, to closing culture gaps and eliminating legacy inefficiencies. In this framework, the focus is on the intersection of people and technology, not one or the other.

Leadership should properly identify and communicate the “why” that underlies every action of the organization. Teams should be connected

and trained to speak the same language about progress and change. Disconnected work styles — such as that of the micromanaging COO — are identified and addressed, as are misunderstandings around the true meaning of growth (it’s about both people and profits, not merely the bottom line).

When opportunities to move forward as a team are missed, everyone learns from that lesson and does better next time.

Properly undertaken, a holistic approach to transformational change will yield immediate benefits for today’s construction companies. However, focusing on multiple domains also stands to better position contractors for the future.

The construction industry is undergoing a radical change as older generations turn over the reins to the millennials and Generation Z. These younger leaders happen to be digital natives who value awareness and organizational engagement. If we fail to create workplaces that feel like home to them — holistic environments where knowledge gaps are closed quickly and technology continually improves — they will look elsewhere.

The alternative is to build a solid foundation for a brighter future by bringing holistic thinking into everything we do. ▲

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How to Mitigate Risk in Construction Projects to Grow Profits

Identify, manage & reduce jobsite hazards & threats

BY DAVID REDD

All construction projects carry some level of risk that needs to be identified, assessed and managed so construction projects are not negatively impacted. There are four main types of risk in construction: financial, safety, scheduling and legal. Effective risk management helps construction companies grow profits by ensuring projects are completed on time, within budget and without incident.

By following these steps, construction companies can minimize the impact of potential risks and hazards on the project, ultimately ensuring the successful completion of the project:

- Risk identification
- Risk assessment

- Risk prioritization
- Risk mitigation
- Risk monitoring and control

Identifying Risk

Risks associated with a construction project need to be identified. These include environmental hazards, design flaws or construction site accidents. It's important to note that risk identification should be an ongoing process throughout the construction project, as new risks may arise as the project progresses.

To identify risks, project plans and specifications must be reviewed to uncover design flaws, site constraints and regulatory compliance issues. Site inspections should be conducted

with management looking at issues with site conditions, environmental hazards or safety concerns. Project stakeholders, such as owners, engineers and contractors, should be consulted to alert the project lead if there are any budget constraints, changes of scope or scheduling issues. Brainstorming sessions with project members can uncover potential risks that have not been previously considered.

Project teams can review historical data from similar construction projects to help identify potential risks that may have been encountered in the past, such as delays, cost overruns or quality issues. With a risk checklist, managers can systematically review all aspects of the construction project for any additional risks. Identifying risks early in the project allows project teams to be more proactive instead of reactive, helping save time and money.

Assessing & Prioritizing Risk

Once the risks have been identified, construction businesses need to analyze the identified risks to determine the potential impact the risks will have on your project. Prioritize the risks according to the potential impact so you can act on the most threatening risks first. Assess the likelihood that each risk will occur and its potential impact on the project. This evaluation can be done using a risk matrix or a similar tool to assign a likelihood and impact score to each risk. By prioritizing risks on potential impact, project teams can focus their efforts on the most critical risks that require immediate attention.

Then you will need to develop strategies to minimize the impact of the risks. These strategies can include redesigning the project, changing the construction methods or materials, implementing safety

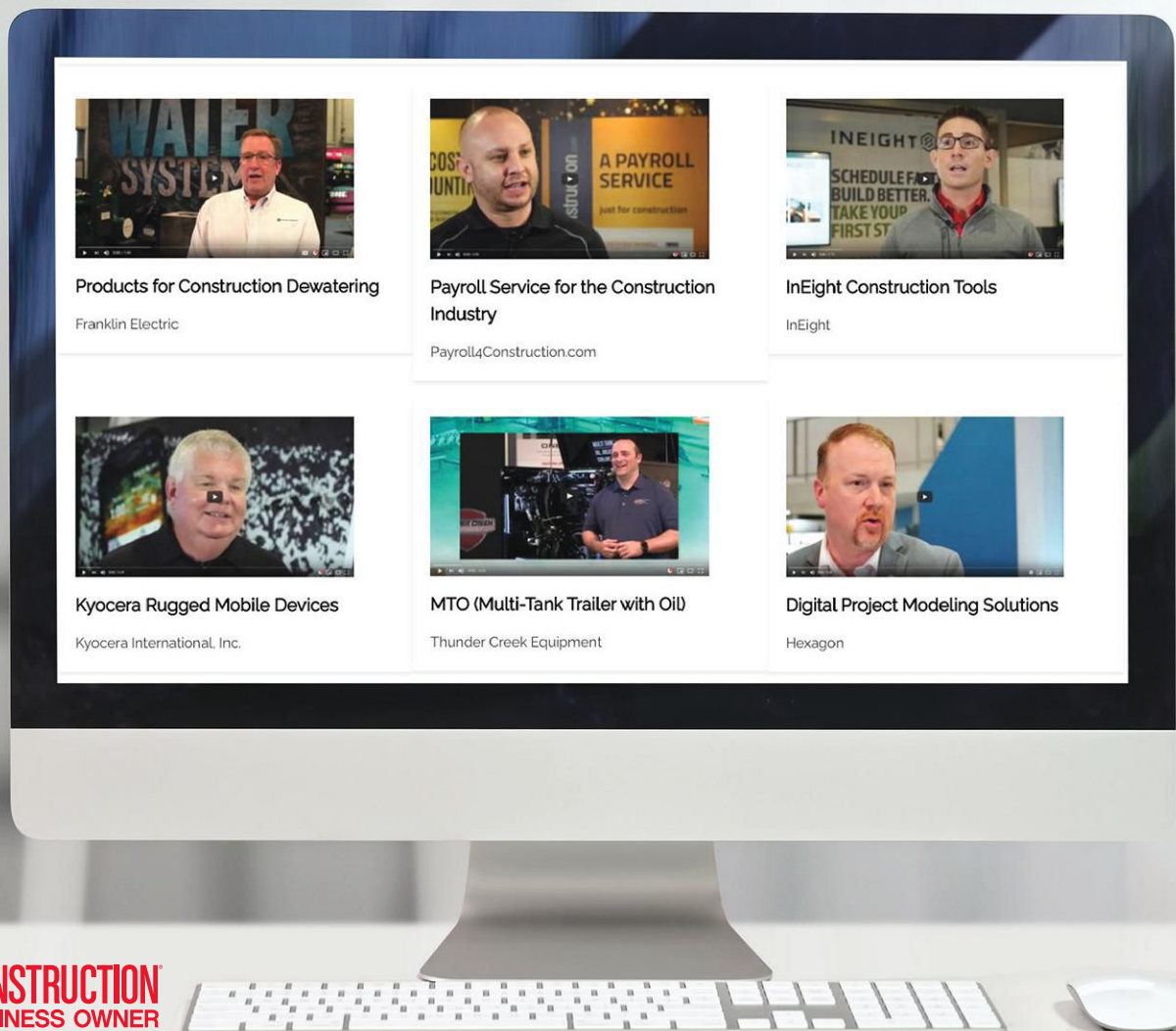




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measures or developing contingency plans. Construction firms can optimize the project design to minimize potential risks by using more durable materials, minimizing construction site hazards or improving the project's functionality.

Safety measures should be implemented to reduce the likelihood of accidents and injuries, such as using protective equipment, establishing safety protocols and training workers on proper safety procedures. Develop contingency plans that outline a course of action for unexpected risks or issues, such as developing alternative project plans, establishing backup suppliers or having a reserve budget.

Team members should be chosen to implement these mitigation strategies. Most importantly, resources such as time, money and personnel must be allocated to implement the strategies effectively. Hold regular project meetings to maintain open communication and collaboration between the team members to ensure risk mitigation strategies are being implemented smoothly and promptly.

Using comprehensive skills and certifications management software reduces risk. With these tools, you are confident that you are sending the right person to the right job and that the crews have the right skills to do the job. This software keeps crew certificates up to date, so your business is not exposed to a regulatory fine.

Mitigating Risk & Managing Projects

Risk mitigation at your construction project can be improved by using technology, such as project management systems that automate the tedious tasks of project management so managers can spend more time making profit-impacting decisions. With daily job costing and progress tracking, project managers can know which projects are profitable

and on time without setting foot on the jobsite so they can focus on the projects that need intervention.

With project management technology, project managers can regularly review the project's progress to ensure the project is on time and on track. You can identify potential risks that may arise due to delays or changes in project scope; then, you can evaluate whether your risk mitigation strategies have been implemented and are effective.

Contractors should document all risk management activities to mitigate risks adequately. Communicate regularly with project stakeholders, including the project owner, contractors and other team members, to ensure that everyone is aware of any changes in the risks and the status of the risk mitigation strategies.

Monitoring & Controlling Risk

Continuously monitor and review the risk assessment throughout the construction project to ensure that risks are being effectively managed and that new risks are being identified and addressed as they arise. Implement quality control measures to ensure the project meets the required quality standards and specifications, such as establishing quality checks, conducting regular inspections and hiring qualified professionals.

A well-planned project is less likely to experience unforeseen risks. Develop a comprehensive project plan that includes timelines, budgets and risk assessment. The risk assessment should cover site conditions, construction methods, materials and environmental factors. When monitoring risk, focus on quality control by including inspections, testing materials and workmanship to ensure compliance with specifications and industry standards.

A comprehensive safety management program can minimize risk on the

jobsite, including reducing the chance of accidents and injuries. A safety management solution eliminates paper in processes so that all project team members can see what is happening and what needs to be done to ensure a safe jobsite.

The software can help identify and evaluate potential hazards on the jobsite, such as documenting unsafe work practices, environmental hazards or hazardous materials. Implementing a safety management solution ensures that the project complies with local, state and federal regulations. The software collects safety records and documents that can be shared with regulators. It will report and track incidents and near-misses and allows the project team to review data to identify trends and patterns that can help prevent future incidents.

Safety management software allows foremen to electronically record safety meetings and easily keep track of attendee signatures and photos. Users have access to more than 1,000 built-in safety meetings and have a history of all previous safety meetings at their fingertips for easy access. By ensuring that all stakeholders on the project are aware of the risks and how to address them, the risk of accidents and injuries is reduced.

Effective risk management is critical to the success of construction projects by helping to avoid project delays and cost overruns and enhancing safety and improving quality, resulting in improved profits and customer satisfaction. ▲

David Redd is the content manager for HCSS, a provider of construction management software for estimating, field entry, project management, safety, digital plans, fleet management and telematics. With 24/7 instant support and a proven implementation process, HCSS has helped improve operations for over 3,500 companies ranging from \$1 million to billions in revenue across the United States and Canada. Visit hcss.com.





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Moving Forward in a Volatile Era

How to leverage tech to control financials & gain certainty in uncertain times

BY WAYNE NUNZIATA

Construction contractors have become well practiced at triaging an array of pain points from continued inflation, backlogs, supply chain challenges and a labor shortage. Years of fielding geopolitical and economic curveballs have accelerated the digital transformation of an industry famously reticent to abandon traditional processes.

Pre-pandemic, McKinsey & Company found that the largest clusters of technology use cases included 3D printing, modularization and robotics/digital twin technology.

Today's atmosphere of ambiguity and volatility has motivated more construction companies across the value chain to deploy digital technologies to get a clearer picture of project operations and strategic inventory strategies, optimize asset efficiency and manage risk. Most experts expect an economic downturn in some form. The American Institute of Architects' (AIA) Consensus Construction forecast, which compiles numbers from several prominent analysts, predicts nonresidential construction spending will grow at about a 6% clip this year before flatlining in 2024 to less than 1% growth.

As new geopolitical and economic headwinds whip up this year, nonresidential construction executives are turning to tech platforms and point solutions to take unprecedented control of financials to create the greatest certainty in an environment plagued with uncertainty.

Tech to Take Control of Your Financials

To make the right decisions in accordance with the up-to-the-minute health of a business, contractors need to be able to appraise their financial situation on demand. Digital solutions are available to help contractors have a clear and constantly updated view of financial statements, credit scores, work on hand, bids history, management reports, current and aggregate limits, underwriting profile and open bond liability. Construction companies are under pressure to safely deliver high-quality projects on time and within budget despite external factors outside companies' control, like labor shortages and supply chain bottlenecks. Supply chain delays have led to disrupted timelines, so construction executives are turning to project control and cost management software that can crunch the numbers in real-time so leaders can eliminate surprises and make informed decisions. In an industry enduring low profitability and thin margins, executives cannot afford to neglect technologies that can unearth optimization and efficiencies buried in legacy processes. Additionally, McKinsey & Company suggested that digital transformation can result in cost reductions of 4% to 6%.

Owning the Bid Process for Accurate, Speedy Bids

The faster a contractor can get qualified and obtain a bid bond, adjust bids, update

work in progress, obtain additional credit and order performance and payment bonds, the better position they are in to win jobs. To gain an edge on the competition and to maximize margins, contractors must master the bidding process not only by submitting winning bids but also accurate bids in line with fluctuating costs. With so many factors influencing labor, materials and energy costs in today's inscrutable economy, contractors must guard against incorrectly building future costs into bids, which can be potentially catastrophic. Losses would also lead to more expensive rebuilds, so the sum insured and bonded may need to be revised to minimize the risk of being underinsured. The manual method to get bids and performance bonds involves a tedious process of sending the bid invitation letter, job specifications and bid request forms to their insurance agency, which would get an offer from a surety bond company after lengthy credit and background checks. If the contractor wants to submit another, higher bid, then the agent will request more information, resulting in an endless back and forth. Technology platforms now make it possible for contractors to go online and swiftly and accurately acquire, control and keep track of bid, performance and payment bonds.

Contractors Use Tech to Issue Their Own Bonds

Granting their own power of attorney is

another way contractors can take control of their destinies. Previously, the insurance agent would have power of attorney, know what the bid is (and sometimes see competitors' bids too) and issue the bond.

Contractors need to be agile in executing a competitive bid in an atmosphere in which bids need to come in up to the eleventh hour, and razor-thin margins determine wins and losses. New software solutions enable insurance providers to grant power of attorney directly to contractors, enabling them to issue their own bid bonds and order performance and payment bonds instantly online.

Contractors who issue their own bonds through digital platforms can deftly incorporate last-minute labor costs, price fluctuations and supply substitutions, which can make all the difference. Plus, with no intermediary, nobody knows the bid except the contractor and the company. Contractors with their own powers of attorney can move faster in getting bonds instead of ceding power to middlemen who may be motivated by commission.

Tech to Stay Compliant With Rising ESG Standards

Sustainable construction had become a new priority even before 2022's Inflation Reduction Act passed, earmarking hundreds of billions for clean energy, transportation and manufacturing. Environmental, social and governance (ESG) risks are rising, as organizations of all types from retail and hotels to



education are building in alignment with consumer expectations and regulatory standards. Contractors are leveraging technology to gain visibility into what had previously been a black box: measuring sustainable practices like waste generation, energy consumption and sustainable materials sourcing. Corporate and government clients will continue to list ESG concerns as an increasingly important part of their building requirements. Deloitte forecasts that 2023 will likely bring considerations for green construction materials, renewable energy sources, and a wide range of supply chain topics, like transparency and traceability. Having a clear, data-driven view of sustainability practices allows contractors to meet compliance standards while moving forward with projects profitably.

Contractors Regaining Control in 2023 & Beyond

The passage of the CHIPS Act and the Inflation Reduction Act will enable

nonresidential construction to lean on manufacturing, institutional and infrastructure to stay profitable as the Federal Reserve aggressively reels in the economy.

Having a clear awareness of financials allows contractors to be agile in moving forward with projects accordingly despite rising costs and additional challenges — harnessing the power of technology can be the decisive competitive advantage. In this complex and competitive era in nonresidential construction, technology is the practical solution to eliminate surprises and make informed decisions to gain visibility, competitive edge, speed and certainty. ▲

Wayne Nunziata has been the president of Colonial Surety Company (Colonial) since 1986. Colonial is a direct and digital insurance company rated "A Excellent" by A.M. Best. At Colonial, Nunziata leads a team that developed a simple online system to write surety, fidelity and insurance products in all 50 states. Visit colonialsurety.com.



How Relational Software Can Advance Your Processes

Understanding tech options & how they impact operations

BY ERIC MALOUFF

Software selection can be a daunting task, whether it's for accounting, project management, scheduling, estimating, timecard capture, contact management or another process. Software becomes part of your infrastructure.

Business is about doing better than the competition. Quality, efficiency, customer service and other processes are impacted by software. Also impacted are cost and organizational controls and, in turn, the risk of losing money on a project or falling short of optimal profit on a project.

This article is meant to provide perspective when choosing software options. Do you select software specific to the various tasks? Do you select a modular system that facilitates each task through subsystems that are integrated? Or do you select a relational system where data and application controls are centralized?

Multiple Software Applications

Different software applications are selected to maintain data and tasks for different facets of your business. Developing software is like a design-build construction project. The vendors have developed their systems independently over periods of time. Mixing and matching software components from different software suppliers can have varied results. Integration between

different applications is never seamless, and data generally has some level of incongruence.

Modular Software Applications

Modules are subsystems within the same software application. Integration is how data is shared between the subsystems. Transactional data is posted between modules.

If you take a database class, in the first week you learn about normalizing your data structure (eliminating duplicate data). If you have an accounts payable (AP) invoice that is entered into an AP module and posted to both job cost and general ledger modules, then this simple rule is broken. There is a difference between accounting and other processes such as estimating, project management, schedule, timecard tracking, etc. These other subsystems generally interact with one or more of the accounting modules. Thus you still have the limitations presented by modular data.

A major component to reducing code and improving quality and efficiency involves centralizing controls and components. For example, the code to draw a grid should be in a system one time. Every time a grid is used, this exact code should be used. With separate pieces of software that are integrated, it is less likely that the interface uses centralized controls and components.

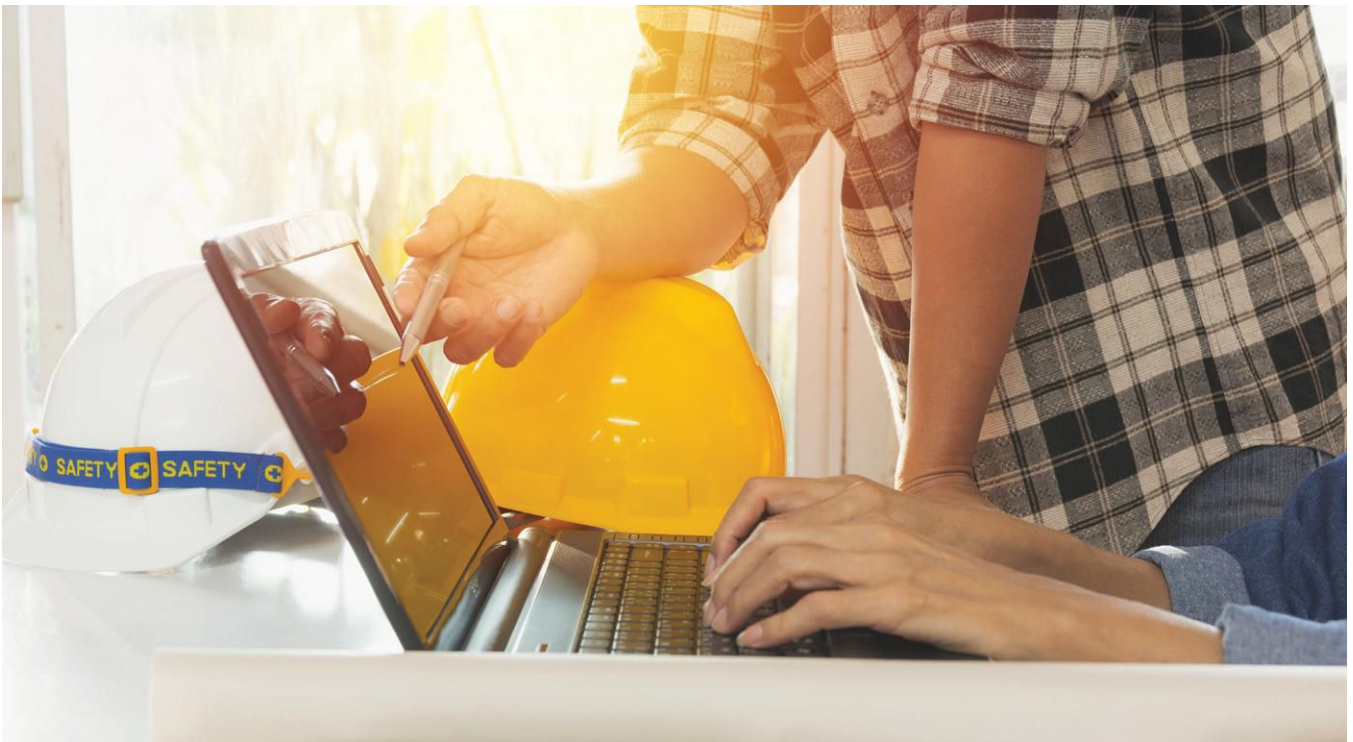
Posting accounting transactional data between modules is redundant and unnecessary. This process also makes it difficult to provide automated audit trails and to report where data is maintained under many modules. Modular transaction data that is generally maintained in the subsidiary, job cost and the general ledger also consumes a lot more space than a relational system.

As a modular system matures, the complexity becomes harder and harder to contain. A beast of a code base makes maintenance and enhancements difficult. A well-coordinated army of developers is required to pile additional code on top of code. Over time, these systems become massive. They are characteristically rigid and less efficient to maintain.

Relational Software Applications

A relational system doesn't have modules. Instead, a relational system will have facilities that use centralized data. An AP invoice will be stored in a centralized transaction structure. Each facility will use the same centralized address books, item lists, transaction structure, task lists, etc.

Relational systems have other advantages. Dynamic setup becomes possible. If you've ever implemented a system where implementation decisions are irreversible, then you will understand this concept. Relational systems have a



dynamic architecture, and thus setup decisions can be changed at any time. Removing the coordination between modules and subsystems simplifies the setup. Thus, a system can be set up initially to reflect most use-case scenarios, and can be adjusted during implementation.

Centralizing controls and components simplifies training because each facility in the system utilizes the exact same code and functions in the same way.

Normalized (nonredundant) data structures provide for ease-of-use features such as automated audit trails, automated over/under billings, automated accrued wages, and automated retroactive allocation of over/under allocated indirect cost.

Also facilitated is reporting that isn't limited because data is centralized, such as percentage-of-completion financials (including a full summary of contacts that report wages as of the work date, not the check date).

Relational system architectures provide for a much larger feature set.

As the system matures, the complexity is contained. A smaller development team is preferred where production is high and team coordination is facilitated. So, relational systems evolve faster.

Gained efficiencies are achieved when a process is refined. Relational systems generally provide for pliable dynamic processes that conform to processes that are chosen by your company — rather than processes that are dictated and include lengthy checklists.

Conclusion

Relational architectures are advanced. Why doesn't every system have an advanced architecture? Because modular, full-featured systems have been developed over the last 40 or 50 years, and it would take rewriting the software's core to change the architecture.

Relational architectures require software infrastructure, and this process takes time. But development on the other side of that infrastructure is simplified, and a software development team can be significantly more productive.

You have many choices with the software available, and the types of systems to incorporate into your infrastructure. Your competitive advantage/disadvantage and, ultimately, your reputation and profitability are impacted by the infrastructure you put in place and maintain. A relational system provides efficiency, advanced feature sets, ease of use and the ability to evolve. Relational software can be significantly less expensive than modular software when it comes to implementation, maintenance and upfront/ongoing vendor costs. ▲

Eric Malouff is a certified public accountant (CPA) who grew up in the construction industry. His father was a dirt and asphalt contractor. Growing up, he worked as a laborer, foreman, project manager and estimator. In college, he worked part time for two years as a software developer while finishing up accounting and computer information systems degrees. Malouff started Malouff & Company, P.C. CPAs in 1990 and practiced in public accounting specializing within the construction industry for 18 years. He is the CEO and founder of TimeSuite Software (founded in 1994). Visit timesuite.com.



Top Questions Students Ask About Construction (Part 2 of 2)

5 FAQs from graduates entering the job market

BY ASHLEY JOHNSON & ASHLEY WILLIAMSON

At Virginia Tech, preparing for a career in the construction industry doesn't begin senior year. Students' first few months in the class also involve site visits, guest lectures from industry professionals and career fairs with opportunities to network with hundreds of company representatives. These relationships are absolutely crucial, not only for our students but also for companies to see students' growth over time.

As students begin to look at their path forward and career in construction, many are in a great position — multiple job offers and a world of opportunity in front of them. There are many considerations that go into a student's first full-time job. The following are five main themes that each student considers in one way or another.

1. How do I decide where to live?

Right after graduation, many students are at a time in their lives when they want to travel or try out a new city or location for a while. However, many know exactly where they want to be, whether that is near family, networks of friends or the projects they want to work on. Regardless of where they live, they want to know the specific project and/or office locations early enough to position themselves for a short commute home. Many alumni describe feeling anxiety about finding proper accommodations in a high-rent and limited supply housing market. After

experiencing the strain of moving once, most alumni say they prefer to settle down in an established location to be close to partners, family and friends.

Other alumni change jobs more frequently, something that appears to be a side effect of the current economic climate. They know their skills are in high demand and can see a location as temporary. A great way to improve employee retention is by encouraging people to engage in out-of-office experiences and put down roots — two things that can help their well-being outside of work. Local tours of the city, introducing students to neighborhoods, getting involved in community centers, and attending sporting or other events as part of a company mentorship or human resources (HR) program are great examples of these out-of-office experiences.

2. How do I decide between companies?

There are a couple of different hiring philosophies for companies and students. A popular one for companies is to entice students early with strong internship and co-op offers and build upon that experience into a full-time job. For some students, it's a great opportunity to learn the ropes and company culture before committing to a full-time position. Often, companies will offer a full-time signing bonus for each summer spent learning under their leadership. However, if the

student only has firsthand experience with one company, then there is a risk that, after full-time hire, the student will discover the company isn't a good fit.

Other times, students work for different companies each semester. They get to see different facets of the industry and decide what area best suits their skills and ideal working environment. The downside for companies is training new people each year.

Inevitably, no matter which path the students choose, they begin asking, "Is this company a good fit for me?"

This is a dilemma that they often seek advice for, but it's not an answer an educator can give a "yes" or "no" to. It's important for students to be able to weigh what factors are important to them, whether that's location, money, opportunities for growth or something else. An alumnus who works at the company in question can be great resource for students. This allows someone who has been in their seat to have the opportunity to talk through their decision-making, as well their experience in the company. It also creates a direct networking opportunity for a company and the student body.

Graduates receive multiple offers. It's a good problem to have, but the decision leads them to look at ways to decide between companies. We encourage them to weigh the factors that are important to them. While some graduates focus on dollar value, most make the

decision based on company size, ability to move ahead in their career, project type and company culture. The culture considerations not only take into account the location and size but also work-life balance, ability to make friends, diversity, cleanliness and integration of technology.

At the end of the day, it's a choice that only they can make, but you as a company can help alleviate concerns and questions by being transparent.

3. Is this a good offer?

As students decide between multiple offers, we discuss what is included in a job offer, and we ask how they weigh those components (pay, benefits, retirement, vacation, company vehicle, etc.) so they prioritize what is most important to them. If there's one thing to know, it's this: The construction industry is small, and people talk — especially students. Our students seem to know exactly how much their peers are making.

Students often ask about average starting salaries. We can provide averages, but we prefer to provide the maximum salary, which was \$84,500 for the class of 2022.

Usually we ask, "Do you feel comfortable with that offer given the cost of living where you plan to live?" This prompts students to do some research on the area, average rent and housing prices. Students weigh more than just the salary; they consider some of the other benefits: signing bonus, moving stipend, truck, retirement, etc. Many do not put much emphasis on health insurance because they are young and healthy or on their parents' plan. A major difference with these students versus other sectors is how they view their working space. They expect to be in an office or trailer and are not impressed by the aesthetics. While gimmicks such as beanbag chairs, games or other fun workplace things may work with younger interns, graduating seniors do not care as much.

4. Should I negotiate for a better offer? How?

First, we find out what they want to negotiate for: Is it more vacation, more opportunities for upward mobility or more benefits? Often, their answer is higher pay. If a student wants to try their hand at negotiating, we encourage them, as long as it's polite. Although some companies do not negotiate, typically the worst a company will say is no. We have never seen a company revoke a job offer related to an attempt to negotiate. If the company does say no to the negotiation, then students either take the job anyway or consider a different option.

Students are not looking to be greedy, but they talk more about their salaries with each other, and they want to earn equal or higher salaries than their peers. We are supportive, but also remind them it is not polite or common practice to discuss salary with anyone, especially their peers.

Unfortunately, the industry's starting salaries have stalled in the past decade. Averages are slowly edging upward but not at the same rate as our engineering competitors, such as computer science and other engineering disciplines. Raising the average starting salary ultimately helps us recruit higher quantity and quality students we can educate to become the next generation of construction industry leaders.

If you are unable to meet a student's negotiation request due to equitability for retaining your current talent, you can also walk them through your raise or bonus structure and discuss promotion opportunities. This allows the student to map out their long-term financial goals.

5. How do I decline an offer from a company that I like or previously interned for?

Once students have evaluated their offer, they inevitably have to let another company down. We emphasize several

things in this position: be polite, be upfront and timely. Since companies are looking to fill positions, the sooner they know, the sooner they can make an offer to someone else.

However, the pendulum can swing too far the other way with companies giving too tight of a timeline for acceptance, which can scare students away before they have time to think about it. My recommendation for companies: If you want to hire a summer intern for a full-time position a year out, give the student at least one semester to figure it out.

The pressure to sign can also lead to students pulling out of an accepted offer and burning bridges. We encourage students to leave companies and industry relationships in a good place. The construction industry is big, but it's also small enough that paths can easily cross over time.

At the end of the day, students have a lot to weigh as they enter the job market. The best form of recruitment starts with relationship building. Sign up to be a mentor, provide a guest lecture to a class, sponsor a capstone project, go beyond the typical career fair season, and find unique opportunities to further students' education by getting involved in the education process. ▲

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Ashley Williamson serves as the outreach and engagement coordinator for Myers-Lawson School of Construction. Williamson acts as the communications and marketing lead for the school and merges industry interests with student-focused events. Visit mlsoc.vt.edu.





OSHA's List Highlights Opportunities for Contractors to Improve Safety

5 top violations & tips for staying safe on-site

BY LAWRENCE BARONE

Construction sites can be dangerous for workers — especially when safety standards aren't defined or maintained. To help businesses understand and reduce common injury causes, the Occupational Health and Safety Administration (OSHA) releases an annual review of its top 10 most frequently cited safety violations across all industries.

This past year, five construction-specific violations appeared in OSHA's preliminary top 10. Each category provides an opportunity for you to pause, assess and address your business's potential hazards. By doing so, you can help reduce the risk of accidents and injuries while avoiding potential penalties.

Let's take a closer look at the industry's top violations and how you can keep your team protected.

1. Fall Protection – General Requirements (1926.501)

This is the most common violation in all workplaces. In construction, falls can be caused by:

- Loose, unanchored flooring
- Slippery walking surfaces
- Ramps without skid- or slip-resistant surfaces
- Hidden trenches, pits or excavations
- Improperly installed or missing guardrails
- Lack of fall protection
- Support giving way or collapsing

- Improperly rigged safety nets
- Debris or clutter on the construction site
- Poorly maintained ladders and stairs

Falls are the leading cause of death for construction workers. In 2021, the Bureau of Labor Statistics (BLS) reported 378 construction fatalities due to falls.

TIPS: To help protect your employees, ensure they use harnesses and other fall protection wherever necessary. Make sure your jobsites are kept clean and organized, workers wear proper footwear for the job, wet conditions are remedied as soon as possible, and protection is provided where there's potential for falling objects.

2. Ladders (1926.1053)

Ladders are essential tools on a jobsite; however, workers risk injury when they use them in an unsafe way, like for scaffolding or as a platform. It's also dangerous to climb onto the top step of a ladder or use one that's damaged.

TIPS: According to OSHA's standard, ladders need to be regularly inspected for visible defects. They must also be inspected after any occurrence that could impact their safe use. Train employees to use ladders safely, and provide ladders that can sustain at least four times the maximum intended load.

3. Scaffolding (1926.451)

Injuries can occur on scaffolding when they are designed improperly and there's inadequate fall protection, slippery surfaces, loose or insufficient planking and supports, or falling debris.

TIPS: Review the full OSHA standard to ensure your scaffolds are in alignment with weight limitations, planking and decking. Train employees to properly design and construct scaffolds, and inspect them frequently as projects progress. If there are damaged sections or pieces, remove and fix them.

4. Fall Protection – Training Requirements (1926.503)

Yes, fall protection made OSHA's list twice — this time related to training. You're required to provide a training program for each employee who might be exposed to fall hazards.

Through this training, your employees learn to recognize hazards and how to minimize them. They should be trained in the use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones and other necessary protection for the work they're doing.

TIPS: When employees aren't trained in fall protection and prevention, accidents are more likely to happen. To further help keep your employees safe, assess fall hazards on every jobsite.

5. Eye & Face Protection (1926.102)

While preventable, injuries can occur when flying particles, hazardous chemicals and other debris strike a worker's eyes. This can happen when the materials are ejected from tools, fall onto a worker from above or are blown by the elements into a worker's face.

TIPS: Train employees on the proper use and maintenance of eye and face personal protection equipment (PPE) — this includes safety glasses or goggles, face shields, welding helmets and laser-safe lenses — and ask supervisors to monitor the use of PPE around hazards.

Be Aware of Risks Outside OSHA's Standards

You'll lessen your risks by complying daily with OSHA's standards. Injuries do occur, however, outside the scope of OSHA's governance.

Examples include injuries that happen when an employee uses improper lifting techniques.

TIPS: Take a moment to assess and address the areas where your employees are injured most often, and tighten precautions and training accordingly. Injuries can cause long-term work absences, affect the mental health of your employees, impact productivity and raise your workers' compensation costs.

Create a Culture of Safety

Managing risk in the construction industry can seem like a moving target, but proactive efforts help provide long-term benefits and prevent significant losses to your business. It takes everyone — employees and management alike — to create a safe workplace. There are several ways to build a culture of safety for your business, including:

- Develop a comprehensive safety plan or strengthen an existing one.
- Hold regular safety meetings.
- Invite employees to take turns leading safety meetings so they take ownership of the safety plan.
- Conduct thorough assessments of motor vehicle reports (MVRs) prior to hiring.
- Offer incentives for safety.
- Encourage leaders to model safe behavior while on construction sites and in facilities.
- Make cybersecurity part of your plan for your employees and vendors, including commercial building systems, mobile devices and the technology your employees use.

When you foster a culture of safety, employees feel supported in making safe choices and avoid cutting corners. They proactively address risks and take the necessary steps to help ensure the safety and well-being of themselves and their co-workers.

Protect Your Employees & Your Bottom Line

Given today's tight labor market, it's even more critical to keep your employees safe. Use the OSHA report to help improve your workplace safety. The benefits may include:

- Decreased workers' compensation claims from injured workers
- Increased productivity so you stay on schedule
- Reduced potential for legal fees and compliance fines
- Avoiding potential negative publicity and damage to your reputation
- Improved morale among your workers

You don't have to go it alone. Some insurers have loss prevention and safety teams who can help policyholders set up or bolster a risk management program. Contact your insurer to see how they can help you maintain a safer workplace.

For the most up-to-date regulations and interpretations of the rules, visit [osha.gov](https://www.osha.gov), or speak with a local expert to discuss questions you have specific to your business. ▲

Lawrence Barone is a senior safety services consultant with Sentry Insurance. Sentry provides property and casualty insurance to construction businesses. Visit [sentry.com](https://www.sentry.com).



How Does Ladder Use Cost Your Company?

Examining the impact of wasteful motion on workers & business

BY SARA VINCENT



The construction industry is burdened with a massive productivity problem. And ladder use is contributing to it. Ladders can cause wasteful motion, which leads to fatigue and reduces productivity. The less productive contractors are, the more costly it is.

According to a McKinsey Global Institute report, lagging construction productivity costs the global economy \$1.6 trillion a year.

Wasteful motion from climbing a ladder alone can set construction companies back more than \$5,500 per worker a year, according to the Mechanical Contractors Association of America (MCAA).

Also concerning is the fact that as productivity goes down, the risk of injury goes up — and ladders are already considered to be one of the most dangerous tools on the jobsite. The MCAA says there is a direct correlation between every percentage point of productivity and risk of injury, so if productivity is down 10%, your chances for injury increase 10%.

Injuries to your crew members can add up quickly. The average cost of each construction injury is \$27,000.

So, how can we reduce wasteful movements and perform work at height more efficiently?

Plan Ahead for Construction Site Efficiency

In order to be productive, movement on a construction site needs to be intentional. Before any work begins or equipment for the job is selected, contractors need to perform a site assessment to evaluate how to safely and effectively complete their tasks. In fact, a site assessment must be conducted prior to the start of a job if using mobile elevating work platforms (MEWP) in order to be compliant with American National Standards Institute (ANSI) A92.22 and Canadian Standards Association (CSA) B354.7 standards.

What does a site assessment involve? According to the Occupational Safety and Health Administration (OSHA), its goal is to identify and eliminate or reduce any risks and hazards before they occur by examining the relationship between the worker, the task, the tools and the work environment. OSHA compares this assessment to detective work and recommends asking the following questions:

- What can go wrong?
- What are the consequences?
- How could it arise?
- What are other contributing factors?
- How likely is it that the hazard will occur?

Contractors should think through each aspect of the job, not just the work environment and the tasks to be performed. They must also consider the appropriate equipment and technology that is needed and what physical risk factors crews will experience.

Know Your Risk Factors

As part of the site assessment, contractors should focus on eliminating wasteful motion, said Randy Marzicola, director of business development for JLG Industries.

“We just need to recognize the opportunities to minimize movement, which is a step toward a safer, healthier, sustainable and more productive jobsite,” Marzicola said.

The MCAA says contractors should be aware of eight key motion-related risk factors. They are walking, bending, reaching, climbing, pulling, pushing, lifting and carrying.

Of those eight, Marzicola says there are two most often in play during ladder use — climbing and reaching — but the others can be factors as well, such as lifting and carrying tools and materials.

“With a ladder, you’re climbing up and down, because you can’t really take with you all the tools and material that you’re going to need for the job,” Marzicola said. “And now your hands are occupied, so you can’t maintain your three points of contact.”

During an average shift, the MCAA says mechanical contractors that need to work at height climb a ladder up to 25 times an hour. That number of climbs takes more than 25 minutes a day. Multiply that by a \$50/hour rate over the course of a year: Those climbs can add up to \$5,562 per worker.

Waste Leads to Fatigue

The more you move, the easier it is for your muscles to tire out. Fatigued muscles slow your output down and increase the potential for injury. Reaching while on a ladder to perform work is particularly strenuous.

“You are putting unnecessary stress and strain on your back and shoulders by constantly overextending your arms,” Marzicola said.

The MCAA says mechanical contractors reach an average 100 times an hour, spending more than 43 hours annually on reaching alone. Time spent reaching can cost \$2,165 per worker a year. Wasteful motion and fatigue also have an intensifying effect.

“The risk of cumulative trauma injury to soft tissue increases substantially over time,” said Marzicola. As workers get older, they become more susceptible to fatigue and injury. “Around 45 years of age, you start losing some muscle strength, range of motion and speed,” added Marzicola.

This is a real concern, because roughly 45% of construction workers in the U.S. are at least that age or older, according to the Bureau of Labor Statistics data from 2020. In fact, this is the first time in history that five generations comprise the workforce.

Bending to grab items you need while working on a ladder is another problem. “Having your tools and work materials off the ground near you increases productivity,” Marzicola said.

Ladders are difficult to transport on a jobsite, often requiring two workers to move and set up. This is why carrying objects can be another productivity risk — it puts ergonomic strain on the body.

How to Improve Construction Productivity While Working at Height

The reality is that mechanical and electrical contractors, plumbers, painters, drywallers and facility professionals all commonly use ladders to get their work done. If they want to reduce the wasteful motion caused by ladders, what options do they have? There is a more productive way, according to Marzicola.

Low-level access equipment solutions eliminate climbing by providing large, heavy-duty platforms from which a worker can complete their job. Depending on the specific application, the platform can be raised and lowered through powered and nonpowered options. These lightweight machines are designed to be maneuvered across work areas and meet demanding indoor applications with working heights up to 20 feet.

Another benefit of low-level access lifts is that tool trays and an optional heavy-duty tray with tool tethering capabilities can put everything required to complete a task within arm’s reach.

There is also very little maintenance required for low-level access products compared to other construction equipment.

“With some models, there’s no battery,” Marzicola said. “There’s no hydraulics. That means there are zero hydraulic fluids and zero potential for leaks.”

Only one person is needed to operate a low-level access product, contrasted with the extra crew member that is often required for ladder use.

“A lot of companies do require a spotter with a ladder,” Marzicola said. “So you’ve got two people doing the work that one person could do.”

This frees up the second crew member to complete other tasks, which can contribute to speeding up the pace of the job.

But perhaps the ultimate payoff of reducing wasteful motion from ladder use is that when your crews are more productive, they do better work. “Better quality means less rework,” said Marzicola. “Rework is waste.” ▲

Sara Vincent is the director of marketing for JLG, a manufacturer of mobile elevating work platforms and telehandlers. JLG was founded in 1969 and today has products and personnel across the globe. The company’s safety management system has earned OSHA and ISO certifications in North America and around the world. Visit jlg.com.



How to Help Injured Workers Return to Form

A medical perspective on the impact of injuries & the benefits of holistic recovery

BY CARMEN CAPOCCIA

As 2023 unfolds, economic uncertainty and labor shortages continue to take a toll. In addition to filling open positions, construction business owners grapple with another dilemma — injured employees missing work. The construction industry is notably high-risk; according to the Bureau of Labor Statistics, construction has the second-highest occupational fatality rate. The Travelers 2022 Injury Impact Report found that injured construction workers spend an average of 98 days away from work. The monthslong loss of work is an incredible burden to an already diminished workforce.

In addition, Travelers reported that 40% of injured employees also experience psychological symptoms that can impede the recovery process. If left unaddressed, these mental health concerns may increase an employee's time away from work. So how can you help your workers make a full recovery? To learn more about the recovery process, Construction Business Owner (CBO) Magazine spoke to Dr. Marcos Iglesias (MI), the chief medical director at Travelers insurance. Iglesias has more than 30 years of experience in the areas of workers' compensation and disability treatment, evaluation and insurance leadership. He has developed solutions for disability management, including early interventions for workers to reach preinjury function.

Read on for an in-depth look at holistic recovery and ways this approach can benefit your workforce.

CBO: Construction is a high-risk industry. How do injuries impact a workforce?

MI: Anytime an employee is injured at work, there are many effects on the workforce. The injured employee now needs to focus on getting the appropriate medical care and attention so they can work on their recovery while also navigating the workers' compensation claim process. While every instance is unique, some may encounter challenges during their recovery, such as feelings of frustration or disconnection, especially if they're out of work for a long period.

Other employees may also be affected by the injury. For instance, they may be worried about their injured colleague and concerned about their own safety and well-being while at work. Their workload could increase as there is one less person on-site. Stress can lead to poor performance and poor health.

The employer is now helping the injured employee get the necessary care and attention while also making sure they're maintaining operations. Depending on the severity of the injury, the employer may need to figure out how to manage the same



amount of work with a smaller workforce or hire additional workers.

CBO: What is holistic recovery and why does it matter?

MI: At Travelers, our claim professionals are there to work with the injured employee, and they take a holistic approach. This means they're putting the injured employee at the center of everything they do and assessing the medical as well as the psychological and social factors that may affect how the employee recovers from their injury or illness. These factors are often unrelated to the specific injury but to the individual's mindset, such as catastrophic thinking or lack of positive coping strategies. Identifying these factors early on helps ensure that injured employees are getting the support they need from the very beginning of the claim while also allowing our nurses to intervene when necessary.

CBO: How might a physical injury affect a worker's mental health?

MI: Being away from work because of an injury can lead to an individual

experiencing negative health consequences, such as getting discouraged or not feeling productive or engaged in the community. This period of worklessness is a health and wellness issue, so employers have a role to play: maintaining contact with the injured employee; checking in with them; and encouraging a modified duty program as they recover. Even in construction, where much of the work requires physical labor, there are tasks that can be assigned that could help employees return to work with limitations.

CBO: Why is it important to address an injured worker's mental health as well as their physical health?

MI: As I mentioned, it is important because mental and physical health are connected, and cognitive and emotional factors unrelated to an individual's injury can negatively affect the recovery process.

CBO: What are the potential consequences of returning to work before a full recovery?

MI: One significant risk of going back to work too soon is the

Holistic recovery makes sense; it understands that medical conditions are 'attached' to a real human being who is complex.

potential for reinjury. The decision on when to return to work needs to be made with input from the injured employee's doctor and medical care professionals with insights on unique job demands to help avoid negative consequences.

CBO: How can construction business owners help facilitate a full recovery for their workers? Are there any services injured employees can use to help the holistic recovery process?

MI: When an employee is injured, it's important to respond immediately in a nonjudgmental manner and use an occupational medicine facility that is familiar with construction-related injuries. Then, it can be helpful to maintain contact throughout their recovery and identify transitional duties that can help the injured employee feel valued and productive as they work toward returning to full duty as soon as medically possible.

There may also be tools available through the construction business owner's workers' compensation insurance provider that injured employees can use. For instance, Travelers offers a resilience-building app, called Wysa for Return to Work, to injured employees who indicate one or more psychosocial barriers to their recovery during conversations with a Travelers nurse or claims professional. The app helps users build mental resilience skills that can assist in overcoming psychosocial barriers to function.

CBO: Have you noticed industry attitudes changing toward holistic recovery?

MI: Yes, there is an openness to talking about the whole person. This is a positive development that can help individuals get back on their feet after a work-related injury.

CBO: What else should contractors know about holistic recovery?

MI: Holistic recovery makes sense; it understands that medical conditions are "attached" to a real human being who is complex. By looking at the individual as a whole, we can empower them as they seek to recover and return to function. ▲

Carmen Capoccia is associate editor of Construction Business Owner Magazine & Digital Media.

6 Training Tips for Working With Rented Equipment

How to achieve a safer jobsite, decrease downtime & maximize your rentals

BY MIKE FITZGERALD

Looking to gain a competitive edge on the jobsite? Renting compact equipment, specifically excavators, compact track loaders and skid-steer loaders, can give you and your equipment operators the opportunity to take on short-term projects and access new revenue sources, as well as use the newest and most advanced equipment, all while reducing operating costs and minimizing downtime.

While renting construction equipment offers many benefits, failing to properly prepare and train can lead to issues. To ensure that your business maximizes the benefits of equipment rental, consider these six tips.

1. Follow safety guidelines & provide proper equipment training.

Anytime you rent compact equipment, make sure you and your operators have the proper education and training.

This begins with reviewing the operating and maintenance manuals, connecting with your equipment dealer and, when available, watching video tutorials through the original equipment manufacturers' websites.

Review safety and instructional decals on the interior and exterior of your equipment. The decals can alert you and your operators to potential hazards and provide instructions on how to avoid the

hazards. Make sure to notify the rental company if you see any decals that are worn, damaged or missing. For operators who are new to a particular brand or machine, ensure that they read the decals and follow the machine's operating instructions. If you or your operators are unfamiliar with the equipment, ask your rental store or dealership to provide hands-on training or explain basic operating procedures, including the machine's controls, gauges, signals, indicators and monitor displays. Also discuss recent technology updates with the rental center. Ask the rental center to demonstrate and show you how to get the best performance out of your equipment.

Additional training resources and quick reference guides on proper operating practices include the Association of Equipment Manufacturers' (AEM) safety manuals. AEM is a trade association that provides global services to companies that manufacture equipment, products and services.

Service and safety training courses are also available. Most include a DVD with videos for individual or classroom instruction, and many now have the option to access materials digitally through a website or YouTube page.

2. Instill a culture of safety.

A safety culture starts with management and operational staff members who treat

safety and health as an investment, not a cost, and who demonstrate model behaviors. Guidelines include wearing a seat belt, using the grab handles and steps that are provided for a three-point contact when entering and exiting the machine, and avoiding loose clothing that can get caught on working components or the machine.

Use work lights and a horn (if equipped) when needed to enhance safe operation.

3. Perform necessary maintenance.

Although rental dealerships take care of major maintenance during a rental contract, it's important to perform routine equipment inspection and maintenance. Make sure you and your operators take a few minutes to walk around the machine to look for potential problems before using the equipment.

During the walk-around, complete a full undercarriage inspection for excessive or uneven wear, look for damaged or missing components, and clean the undercarriage to help minimize any material buildup that can contribute to wear. For compact track loaders and skid-steer loaders, regularly inspect track tension and tire pressure. This can minimize downtime and help keep operators productive.

Inspect the battery cables and connections before operation. Corroded terminals can cause hard starting and charging issues that can negatively affect

your experience with your machines. Keep all fluids at proper levels to minimize downtime. This includes fuel, diesel exhaust fluid (DEF), hydraulic oil and cooling fluids.

Typical maintenance procedures are provided in the operations and maintenance manuals and can be performed without specific technical training. However, some maintenance items may need to be completed by a local dealer or at a specialty facility. Ask your rental house or dealer about any specific questions or applications you have.



4. Understand fuel considerations.

Fuel can be one of the most expensive operational expenses and is an important consideration to note when renting compact equipment, especially when using the machine for an extended period. Using clean fuel is your first line of defense to proactively keep the machine running and in top performance.

Here are a few tips to make sure you are purchasing the cleanest possible fuel for your rental:

- Purchase fuel from a trusted supplier.
- Confirm the fuel's cloud point, which is dependent on geographic location and time of year.
- Test bulk fuel tanks every six months if you store bulk fuel at your company's facility or yard.
- Keep supply tank fuel filters clean if they are stored at your company's facility or yard.
- Use 2-micron fuel filters on supply and service tanks.
- Fill machine tanks at the end of each workday.

- For long-term rentals, be sure to keep an updated preventive maintenance log.

5. Assess jobsite conditions.

Once you and your operators are knowledgeable and comfortable operating the equipment, take time to assess the jobsite conditions.

Inspect the work area and look for potential dangers, such as underground or overhead utility lines, and soft ground conditions. All underground utilities should be clearly marked before excavating. If they're not identified, operators should call 811 to schedule a trained professional to identify the underground utilities. You and your operators should look around the jobsite to make sure there are no bystanders, and use barrier tape, traffic cones or gates to keep other individuals and equipment out of the work area.

6. Lock out unwanted use.

Your success in renting compact equipment is dependent on proper

use, storage and upkeep of the equipment. Jobsites are easy targets for equipment theft, so make sure you and your operators are taking the necessary precautions to lock out unwanted use.

It is also beneficial to ask the rental company if the compact equipment has any security features to prevent unauthorized use. It's up to you as a business owner to communicate proper operating procedures to your compact equipment operators. By following these tips, you and your operators can promote a safer work environment, avoid preventable downtime and maximize your rental dollar usage. ▲

Mike Fitzgerald is a marketing manager with Bobcat Company. With more than 30 years of industry experience, Fitzgerald brings his vast expertise in compact equipment to help customers be as productive as possible on the jobsite. A member of the Society of Automotive Engineers, Fitzgerald holds one European and two U.S. patents. Visit bobcat.com.





Re-Imagining Project Development & Execution

Global trends require a transformation in how major capital projects are managed

BY GARY FISCHER

As the world emerges from the COVID-19 crisis, we can clearly see three global trends that will dominate and overwhelm the global capacity to develop and execute capital projects. They are infrastructure, digitalization and decarbonization — the driving forces behind the energy transition.

In the construction industry, the opportunities for growth are enormous, and our capacity to complete projects must keep up with the global demand for buildings, facilities and infrastructure. One recent study revealed that between now and 2060 global building floor area will double, and just the amount of building

floor space required will be equivalent to building an entire New York City every month for the next 40 years.

Let that soak in for a minute.

The pandemic has accelerated change in the digital landscape, forcing companies to adapt or go out of business. 5G is changing the way digital networks are being used, and from what I understand, 6G is around the corner. The new gold is data — which requires storage and transmission.

Now layer on top of this the move toward electrification as the primary energy source, displacing hydrocarbons while meeting the infrastructure demands

of the digital economy. Behind every energy technology are the raw materials that power it, support it or help build it.

The energy transition is moving to technologies far more mineral intensive than current fossil fuel counterparts. “A typical electric car requires six times the mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a gas-fired power plant,” the International Energy Agency (IEA) stated.

According to IEA, an estimated \$100 trillion plus will be required over the next three decades to reach net-zero carbon emissions by 2050.

These three big trends compound on each other. Consider the demand they place on basic materials such as copper, steel, concrete, glass, fibers, plastics and the skilled labor that will be required to do the work.

By any estimate, the available supply of building block materials such as lithium, copper, iron ore and rare earths cannot meet the projected demands. So new mines and refining facilities will also be required.

For example, the recent World Bank's Climate Action report forecasts the 2050 demand for 15 minerals from energy technologies as a percentage of 2018 production. At the top of the chart are graphite and lithium each with about a 500% increase, cobalt with 460% and indium with 225%.

It's important to note that these big trends are all interrelated. For example, about 50% of carbon attributed to infrastructure is generated in the construction phase. So, in order to meet decarbonization goals, infrastructure must take aggressive action. Digitalization requires infrastructure — cell towers and data centers. Electrification increases demand for both digital and infrastructure — solar, wind, nuclear, transmission lines, charging stations and battery storage.

If that didn't shock your brain enough, let's layer on the dearth of people who want to work in the construction industry. By any forecast, if we don't change our methods to execute projects, we won't have sufficient numbers of craft workers in the U.S. today, let alone what is going to be needed globally over the next 30 years.

It's easy to see these trends will create unparalleled challenges and strains on the construction industry and material and equipment suppliers, along with those who mine and refine basic raw materials. These trends will be paced by our capacity to develop and execute projects.

To have any chance of meeting these challenges, real change is required.

Improved productivity of the construction industry is no longer optional — it's imperative.

The time for business as usual is rapidly closing. The pain of the status quo in construction is going to increase exponentially as our capacity to develop and execute projects falls short of expectations.

So, what can we do about it?

Until we recognize projects as production systems and use the science that drives project results, we have zero chance of making significant improvement.

However, even that won't be enough. We need to free ourselves from the limitations of prior eras of project management and instead focus on a new era of project delivery.

Eras one and two — Current project management thinking has a conventional view of trading off scope/quality, schedule and resources to meet targets on cost and schedule. Variability and inventory are not explicitly recognized in conventional project management thinking, and therefore expose construction business owners to hidden risks.

In the new era three of profitability, construction owners have found they can compress time to market and improve project outcomes in profitability and schedule with an operations science approach to projects, in which the project production management (PPM) framework is used to optimize project delivery. For more information, see "A Gap In Current Project Outcomes" by T. R. Zabelle, H. J. Choo, M. L. Spearman, and E. S. Pound.

In this new era, projects will be highly efficient production systems that are automated with robots doing much of the work, embedded sensors will be tracking materials and signaling for the subsequent work to be done, and drones will be measuring progress.

Artificial intelligence (AI) enabled systems will be ordering materials

directly from suppliers without human hands. Facilities will be configured to order. Components will be 3D printed on demand at site. Workers with exoskeletons will be used to assemble components designed in completely different ways from today's methods. This is not just a fantasy.

Imagine the first Ford factory. It was an amazing leap forward in auto production, making cars affordable for the average family. Fast forward to today and visit any vehicle factory: Robots silently working down the line doing things unimaginable just a few years ago. Millions of parts showing up at just the right place at the right time. Consider how the auto worker job today is quite different than in the first Ford factory.

Construction today is still very much like that early Ford factory. We do some amazing things, but not nearly as amazing as what we could and must be doing in the project of the future.

I challenge us, the construction industry, to shake off the status quo and lean into using PPM to start the transformation of how we develop and execute projects.

Real change is not something "they" are going to make — it starts with us. Ultimately, owners who embrace and lead the change in the approach to projects will be rewarded, and those who do not will be left behind. ▲

Gary Fischer, PE, is the executive director of the Project Production Institute (PPI), and chair of the PPI Energy Working Group. He has extensive experience in technical and leadership positions, including 40 years with Chevron's capital projects organization, where he was responsible for Chevron's implementation of project production management and digital transformation on major capital projects. He holds a bachelor's degree in civil engineering from Colorado State University. Visit projectproductioninstitute.org.





4 Ways to Ensure Your Next Green Building Project Makes a Real Difference

Take a cradle-to-grave approach to unlock net-zero construction

BY SANDER VAN DE RIJDT

When it comes to green building, many people think about incorporating energy-efficient features such as effective insulation and glazing, adding eco-friendly lighting or using recycled or repurposed materials. All of those are important, but it's also important to step back and think about

the construction process itself. Above all, it's vital to find new ways to leverage digitization and new technologies to make our work more sustainable across the entire building life cycle.

Since 2005, America's stock of Leadership in Energy and Environmental Design (LEED) certified buildings has grown twentyfold, and with energy prices soaring and corporations, policymakers and consumers all pushing for a greener built environment, the trend shows no sign of slowing. But we still have a huge hill to climb. Buildings are responsible for almost two-fifths of all global greenhouse gas emissions and nearly one-third of total global energy consumption, so ushering in a new era of sustainable construction will take a new, whole-life-cycle approach to designing, constructing and operating buildings of all kinds.

Digitization will have a key role to play in this process, from performing energy-usage calculations to enabling more informed choices around materials, waste, lighting, ventilation and more. The following are four key steps that we need to take to rise to the challenge.

1. Focus on Low-Impact Materials

Planning is key to any construction project, but with a sustainable build, careful forethought is vital. Long before the first foundation is laid, architects and site leaders should use digital tools to model and track the current and future impact of every decision they make — and that includes considering which materials align with the project's sustainability goals, both in terms of immediate impact and longer-term factors such as energy efficiency.

Three commonly used building materials — concrete, steel and aluminum — account for a staggering 23% of global emissions. Fortunately, it's possible to mitigate their impact. At the procurement stage, you can specify low-carbon concrete mixes or opt for so-called “green steel” — produced with renewable power and recycled feedstock — to reduce your project's total footprint.

For some projects, of course, using alternative materials, from mud and straw to eco-friendly lumber, might be a better option. In other cases, digital technologies can be used to 3D-print parts and structures to order, reducing waste.

Of course, using innovative materials also means prioritizing communication such as messaging tools, app-based blueprints and task-management solutions to ensure that planners and construction teams understand the new processes and are able to run their projects in ways that deliver the desired results.

2. Clean Up the Construction Process

Because low-carbon construction often requires new materials and processes, it's vital to ensure that all stakeholders in the construction process are sharing information and plans effectively. Mistakes or miscommunication that result in materials being discarded or structures being rebuilt can sharply increase the total environmental impact of a project, making it impossible to reach net-zero goals.

Of course, keeping sustainability goals front and center during a complex build can be tricky. Even at the best of times, building sites are frenetic places with a multitude of moving parts. From an environmental standpoint, this confusion can be problematic: Whether it's the scope for locating heavy machinery in the wrong place or a misaligned section of insulation, there are plenty of ways for sustainable construction projects to go wrong.

On this front, digital construction platforms are also a huge asset, providing a common landscape in which designers, construction leaders and contractors can collaborate. Keeping things organized is essential in order to generate results, and proper documentation at every step of the process is vital as groups work toward LEED status or other environmental certification programs.

3. Prioritize Sustainable Operations

With more than two-thirds of a building's lifetime environmental impact coming from the way it's used, not the way it's built, it's important to think about your building's lifetime environmental footprint.

Rooftop reservoirs can harvest rainwater for use in cooling systems and bathrooms. Some properties use on-site solar panels, heat pumps and wind turbines to generate their own renewable power.

But you don't have to make big upfront investments to make a difference. Simply swapping out incandescent bulbs for LED lighting can cut power usage by 75%, and properly maintaining and utilizing HVAC units based on real-time needs can also make a huge difference. Even something as simple as lowering blinds or keeping windows and doors closed can make a big difference to a building's impact as well as its operating costs.

To manage a portfolio of energy-saving strategies, ranging from high-tech add-ons to low-tech maintenance and management workflows, it often helps to use digital tools to keep track of how everything is working. A low-carbon building is a finely tuned machine with many moving parts, and keeping everything running smoothly requires facility management platforms capable of monitoring and optimizing the performance of the system as a whole.

4. Don't Forget About Decommissioning

Buildings don't last forever, so it's important to include end-of-life environmental impacts when you're considering your project's total carbon budget. Hopefully many projects will wind up getting repurposed rather than demolished: According to the American Institute of Architects (AIA), renovation projects can save up to 75% of embodied emissions — the total quantity of carbon dioxide produced during a structure's creation — compared with constructing something new.

Sometimes, however, a building simply has to come down. That's why the best green construction companies plan ahead and build in ways that make it easier to dismantle buildings and recycle materials.

The more that can be salvaged from a project, the less its total environmental impact will be.

By using a digital solution to track every step of the design, construction and building management process, you can develop a single source of knowledge for all your building's materials, structures and functional elements. When it's finally time to decommission, that will make it far easier to reduce the whole-life-cycle impact of your property.

A Cradle-to-Grave Opportunity

Sustainable construction is booming — and that means businesses that act now and invest in the digital technologies and other innovative tools needed to realize net-zero and low-carbon principles across the entire building life cycle will be positioned to succeed.

To achieve meaningful results, win over eco-conscious consumers, and make sustainable building more effective and affordable, it's vital to take a cradle-to-grave approach. Sustainability should be front-of-mind from the first time an architect fires up their design software, right through to the moment when a well-loved building is finally retired.

To make that happen, stakeholders at every stage of the construction and building management process must be willing to explore new ways of doing business, harnessing innovative techniques and technologies that heighten energy efficiency, reduce waste and facilitate the use of natural resources. Sustainable buildings have a bright future — it's up to us to lean into digitization and find new ways to unlock their potential. ▲

Sander Van de Rijdt is co-founder and co-CEO of PlanRadar, a digital platform for documentation, task management and communication in construction and real estate projects, serving over 100,000 users across more than 60 countries. Visit planradar.com.



5 Myths & Facts About Electric Equipment

Finding the truth among common misconceptions

BY BRENT COFFEY

Whether it's an excavator, scissor lift, telescopic handler or light tower, all-electric equipment is increasingly available in today's marketplace. Sustainability has prompted many companies to define their emissions goals for the future.

Even so, electric equipment technology is still quite new, bringing with it certain misconceptions and concerns about investing in it. Rental can help eliminate that worry by mitigating the cost and risk of making a purchase. Companies can test the equipment first to learn about its performance and benefits.

To gain a better understanding of electric equipment, it helps to separate common misconceptions from the facts.

Myth No. 1: Electric equipment is less powerful than diesel equipment.

Electric equipment can provide more power than its diesel counterparts since the motors are designed to more efficiently manage how the power is used. For example, an all-electric skid steer can provide power for multiple machine functions to be used at once, whereas a hydraulic machine would be limited. Plus, electric motors, on average, convert approximately 85% of their electrical energy into motion. That compares to about 40% of energy from an internal combustion engine. That power and efficiency can help complete jobs faster, making it an attractive option when deadlines are tight.

The performance of this equipment is exceptionally reliable. The manner in which manufacturers design, develop and test electric equipment ensures it can manage the same, if not more, applications as an internal combustion equivalent.

Myth No. 2: Electric equipment is difficult and time-consuming to charge.

Electric equipment requires a change in mindset and behavior compared to fueling, but it isn't difficult. Users need to take advantage of opportunity charging to keep the equipment up and running when

it's needed. With this process, charging can take place during breaks, over the lunch hour or when the equipment isn't needed for the job.

Having the right jobsite layout makes it easy to top off power to the battery. This means making the right power source readily accessible to maximize the charging opportunity, whether it is permanent power or a temporary power such as an energy storage solution. Since various machines have multiple charging requirements, it is important to understand the power needs of the site in order to maximize production and minimize charging times.

The best way to extend the battery life is to prevent the charge from falling lower than 20% or going higher than 90%.

Myth No. 3: Electric equipment maintenance is difficult.

Electric equipment can have up to 50% fewer parts than a diesel machine, so there is less opportunity for breakdowns. The absence of belts, filters and other moving parts simplifies maintenance and



significantly reduces the risk of downtime for service and cleanup, which supports greater productivity.

Telematics systems also monitor the battery's health to make sure it is functioning properly and allow for proactive care when necessary.

Myth No. 4: Electric equipment is expensive to use.

Because of the elevated upfront purchase price, the rental rate for electric equipment is slightly higher than that of a diesel machine. Even so, that premium rate is typically offset by the lack of fuel and the additional operational expenses tied to refueling. The energy to charge the equipment is significantly less expensive than the fuel required to complete the same task. Overall savings will vary based on how long the equipment operates, the application at hand and location, since fuel prices vary across the country.

Myth No. 5: Electric equipment is unsafe.

Due to the significant reduction in noise, battery-powered equipment has improved safety benefits versus an internal combustion machine. Operators have more awareness of what's around them and can better hear communications on the jobsite instead of listening to engine noise all day. Because electric equipment is significantly quieter, it is imperative that others on the jobsite pay attention when it is in operation to avoid injury.

Regarding maintenance and repairs, it is important that only technicians trained in hazardous voltage access the electrical system of battery-powered equipment.

Making Electric Easy

Renting electric equipment avoids risk of investing in new technology and also provides companies with

operational support. Contractors can access clean power solutions to charge the equipment, as well as consulting services to ensure the right equipment is in place. Rental partners can also help determine if long-term rental is a good option for implementing electric equipment. Longer-term rental of equipment can often be more cost effective. In the case of electric equipment, long-term rental can help contractors reach sustainability goals and gain operational efficiencies. ▲

Brent Coffey has over 15 years of global product management and product development experience with more than 10 years focused on construction equipment. He has been with Sunbelt Rentals since 2018 focusing on product strategy and new product development. He resides in Charlotte, North Carolina. Visit sunbeltrentals.com.



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New Products to Watch

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



▲ CATERPILLAR

352 Straight Boom Excavator

Released: 2/23/23

Availability: North American & European markets

What's new? The new Cat 352 Straight Boom Excavator is designed specifically for low-level demolition work up to five stories high, bridges and industrial infrastructures. Its stick/boom configuration delivers a higher vertical reach up to 42 feet, 2 inches, 36% more stick pin height compared to the standard 352 Reach configuration. Works with up to a 13,228-pound attachment weight. Now offers remote diagnostics and updating capabilities. Remote Troubleshoot allows the dealer to diagnose fault codes and machine issues remotely without interrupting the production cycle. Remote Flash allows software updates to be pushed out to the machine and installed at a time convenient for the customer. Grouped together for simplified maintenance, all fuel filters now feature an extended, synchronized 1,000-hour change interval. Combined, these features help to lower long-term owning and operating costs.

Specs: The excavator's new optional 25,022-pound removable counterweight design increases transportation efficiency and lowers transportation costs. The mechanical variable gauge undercarriage has a 9-foot, 10-inch transportation width when needed and extends in working mode for maximum stability all around. Its new high-efficiency hydraulic fan features standard automatic reverse to keep the cores free from debris and reduce maintenance time. To easily detect objects and personnel around the operator in a single view, the 352 Straight Boom comes standard with rearview and right-hand-sideview cameras, which can be upgraded to provide 360-degree visibility. Smaller cab pillars, larger windows, standard radial roof wiper and washer improves visibility around the machine.



◀ DEVELON

DX89R-7 Mini Excavator

Released: 2/13/23

Availability: U.S. & Canadian markets

What's new? This nimble machine is equipped with a family of products, including a Develon engine and diagnostics tool. The mini excavator boasts a reduced-tail-swing feature, permitting more power in cramped, congested worksites. The DX89R-7 comes with an innovative platform to improve structural durability and machine robustness. Powered by a Tier 4-compliant D24 diesel engine offering more horsepower, the DX89R-7 provides increased productivity from its predecessor. Auxiliary hydraulic flow remains readily available for operators to use hydraulic-powered attachments with the mini excavator.

Specs: An increased machine operating weight and the excavator's new counterweight design provide better stability for increased lifting capacity. Traction force is also higher due to the machine's higher weight, meaning customers can push material more efficiently with a dozer blade. A thumb switch on the left joystick controls the excavator's boom swing. Optional long arm provides nearly 2 feet of additional dig depth and reach.

SAFE SITE CHECK IN ▶ Safe Site Check In Observations feature

Released: 2/7/23

Availability: U.S. market, Canadian market, European market, Other

What's new? Safe Site Check In's new Observations feature enable workers to include notes, photos, videos and attachments to document jobsite conditions and progress. This provides contractors and project owners with accurate, real-time updates for project management, forecasting and strategic planning.

Specs: The QR-code check-in app ensures project managers always know who was on site, what they did and when they signed in and out of the jobsite. Automates the daily report. Used by contractors to digitally document arrival of workers and subcontractors and their skills.



◀ KEEN

Utility Reno

Released: 2/1/23

Availability: U.S. & Canadian markets

What's new? KEEN Utility's Reno delivers a lighter, faster work boot designed for the demands of the modern jobsite. This boot features KEEN.BELLOWS FLEX technology, an ergonomically engineered system designed to offer multidirectional flexion making bending, squatting, kneeling and knee-down work up to three times easier. The boot will be available for both men and women in several colorways and collar heights.

Specs: Includes a KEEN.ReGEN midsole that returns 50% more energy than standard EVA foam, a KEEN.ConnectFit heel capture system to lock the heel down for sure-footed stability, and an ankle-height engineered mesh upper and KEEN.DRY waterproof, breathable membrane to provide dependable indoor/outdoor performance. Offers asymmetrical carbon-fiber toes as well as an EH-rated, oil- and slip-resistant rubber outsole to provide dependable footing.



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Company	Jun 7	Jun 8	Jun 9	Jun 10	Jun 11	Jun 12	Jun 13	Total		
AC Electric						1		1		
EZ Tilez		2	3	3			4	12		
Foggy Bay	2	3	1	2		1		9		
OZ Drywall	3	1	2	2		2		10		
UPS		1				1		2		
Totals	5	7	6	7	0	9	0	34		

Daily Sites										Unique Visitors
Number	Name	Jun 7	Jun 8	Jun 9	Jun 10	Jun 11	Jun 12	Jun 13	Total	

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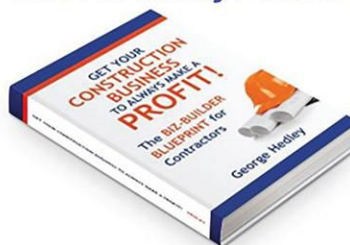
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▲ TAKEUCHI

TB350R short tail-swing excavator

Released: 3/1/23

Availability: Global markets

What's new? The TB350R is the first short tail-swing model in the manufacturer's five-ton class. The excavator has a rear swing overhang of just 2.95 inches, allowing operators to focus more on their work and worry less about rear-swing impacts. The excavator's canopy configuration includes a 4.3-inch high-definition, multifunction color monitor, while the cab model has an easy-to-view, 7-inch touchscreen, multifunction color monitor with integrated air conditioner and radio functions.

Specs: The TB350R weighs 10,980 pounds in canopy configuration and 11,235 pounds when equipped with a cab. It provides a bucket breakout force of 10,431 pounds, a traction force of 12,320 pounds and a maximum dig depth of 11 feet, 8.8 inches. Both canopy and cab configurations are equipped with a primary auxiliary circuit plumbed to mid-arm. The cab model also includes a dedicated coupler circuit operated by controls located inside the cab. The primary auxiliary circuit delivers 26.4 gallons per minute (gpm) at 2,990 pounds per square inch (psi), making it capable of utilizing a wide range of hydraulically driven attachments.



▲ FORD

Digital Rearview Mirror for Ford Transit & Ford E-Transit

Released: 2/22/23

Availability: U.S. market

What's new? The new Digital Rearview Mirror is available for the Ford Transit and Ford E-Transit commercial vans. The Digital Rearview Mirror looks like a conventional rearview mirror but is actually a high-definition screen that displays a panoramic view of the area behind the van. This helps drivers spot cyclists, pedestrians and other vehicles that may be behind them, even when cargo, passengers, windowless rear doors or a bulkhead are in the way.

Specs: With this mirror, the field of view is twice the width of a conventional rearview mirror. A camera located next to the center high-mounted brake light at the rear of the vehicle shows a live feed on the monitor and is designed to project even in harsh weather conditions.

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1. Your company's primary business is:

(Check only one)

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

2. Your primary job title is: (Check only one)

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

3. Approximate annual contract sales volume:

(Check only one)

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

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

(Check all that apply)

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

January 2021/2022/2023 Annual Rate Comparison

This chart compares the two previous years' total value of construction put in place to an annual forecast based on January 2023 figures. (Millions of dollars. Totals may not add up perfectly due to rounding.)

	2021	2022	2023
Total Private Construction	1,159,978	1,326,547	1,442,566
Residential	712,951	829,377	847,353
Nonresidential	447,027	497,170	595,213
Total Public Construction	361,476	350,699	383,088
Residential	9,429	8,974	9,560
Nonresidential	352,047	341,726	373,528
TOTAL Construction	1,521,454	1,677,246	1,825,653

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

\$1,825,653

JANUARY 2023 TOTAL ANNUAL VALUE OF
CONSTRUCTION PUT IN PLACE

“While the downturn in design activity extended to four months in January, **there are signs of easing,**” said AIA Chief Economist Kermit Baker, Hon. AIA, Ph.D. “In particular, architecture firms reported that new project work has begun to increase, signifying that **this decline in billings may reverse in the coming months.**”

AIA Architectural Billings Index (ABI)

National			*Regional - Billings				*Sectors - Billings			
Month	Billings	Inquiries	Northeast	Midwest	South	West	Multifamily Residential	Commercial/Industrial	Institutional	Mixed
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
Dec-22	47.5	52.3	46.5	49.4	48.6	45.5	44.3	45.2	47.3	54.8
Jan-23	49.3	55.2	50.9	51.6	46.9	51.3	45.9	46.8	48.6	56.0

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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in the year _____
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