

THE PRACTITIONER

A monthly newsletter of the Energy Facility Contractors Group's
Project Delivery Working Group



FCOG

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Supply Chain Challenges

By now most are aware of real or potential impacts to projects associated with supply chain issues. It's a given that the supply chain issues include materials and components like structural steel, wood framing material, concrete, piping, electrical wiring and devices, valves, motors and an endless array of other project or plant equipment.

Navigating through the material and component supply chain issues can lead to more complex supply chain issues when you consider in all instances, qualified resources (direct or subcontracted) will be required to install and or operate the necessary construction material.

The current supply chain challenges with material and labor should create a heightened sensitivity with respect to our processes for procurement, human resources, training, planning efforts, and lessons learned in considering the impacts we have already seen and will continue to see in foreseeable future.

This month's *Practitioner* brings you current insight from industry supply chain articles to inform and facilitate confirmation of your current environment, and actions you may want to take to mitigate your projects statistical inclusion in next year's version of these typical industry reports.

SAVE THE DATE! 2023 PROJECT MANAGEMENT WORKSHOP

The DOE Office of Project Management (PM) is pleased to announce the 2023 DOE Project Management Workshop. This annual workshop continues the tradition of providing an opportunity to discuss projects and major challenges with senior DOE leadership, review best practices, share lessons learned, and to recognize excellence. The workshop is a designated training event and attendees will earn continuous learning points (CLPs) for each day's participation.

When: Tuesday and Wednesday, April 11-12, 2023.

Optional: A project controls session will be conducted on Thursday morning, April 13, 2023. For more information see the link below.

[2023 Department of Energy Project Management Workshop | Department of Energy](#)

What's keeping contractors up at night?

Supply chain chaos and an impending recession are among builders' top concerns in 2023, according to a new survey.



Julie Strupp, Editor, ConstructionDive
Published Jan. 9, 2023

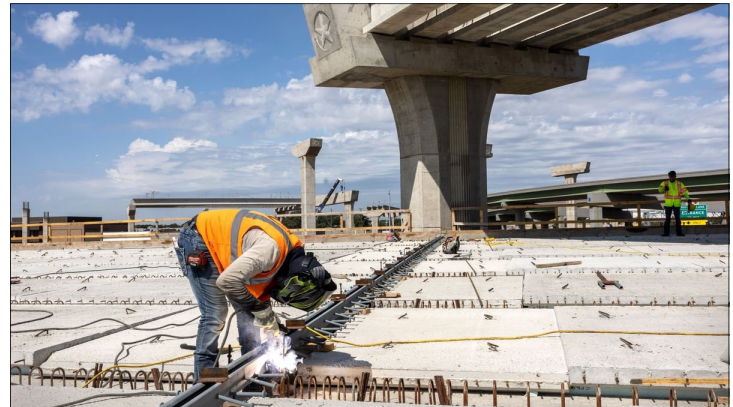
Builders are bullish on infrastructure work this year thanks to federal funding, but expect supply chain snarls and hiring difficulties to persist, according to Associated General Contractors of America's 2023 Construction Outlook National Survey.

COVID-19 continues to impact the industry, hitting supply chains in particular. That's the top concern for builders in the survey, as the uncertainty has caused a variety of negative ripple effects that ultimately mean higher costs and lower

profits. As inflation and the spectre of a recession continue to loom, contractors are feeling less confident about private sector work.

Builders have reason to be worried: last year 36% of respondents had projects cancelled or postponed but not rescheduled. The main reason given, for about half the projects, was rising costs. The association received 1,032 responses overall, primarily from general contractors.

Although contractors are optimistic overall, that doesn't mean there aren't rocky times ahead, said AGC Chief Economist Ken Simonson in a webinar last week about the survey.



A person in a reflective vest and utility mask bends over their work, with unfinished concrete bridge parts in the background.

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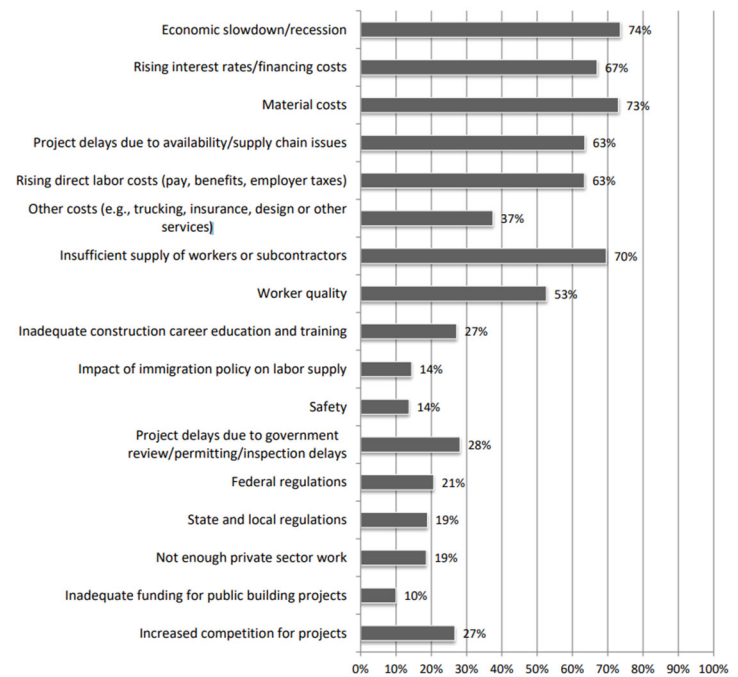
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11. What are your biggest concerns for 2023? (mark all that apply) Responses: 956



Full breakdown of responses to what are contractors' biggest concerns in 2023. Courtesy of AGC

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What’s keeping contractors up at night?

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“Even when we’ve had recessions or slow growth expectations for the economy, contractors are by nature optimists,” Simonson said. “But it is notable that in nearly all of these categories, particularly on the private side, contractors have lower net positive readings or deeper negative readings than they did in previous years.”

Here are some other takeaways from the survey:

Supply chains are still broken

Contractors’ biggest concern for the coming year is the supply chain. The ongoing issues cause project delays, time-consuming logistical headaches and price hikes for materials.

“Supply chain issues and material cost issues will continue, and will continue to have profound effects on schedules and affordability of new projects,” said Mac Caddell, president of Caddell Construction headquartered in Montgomery, Alabama, during the webinar.

To cope in 2022, 70% of respondents accelerated purchases after winning contracts, about half turned to alternative suppliers or used alternative materials or products and 22% stockpiled items before winning contracts.

Hiring will only get harder

Workforce shortages make projects take longer and cost more, and look set to worsen in 2023. In the coming year, 69% of contractors expect to hire and only 11% expect to reduce their headcount, according to the survey. To entice workers, last year 72% increased base pay rates more than in 2021 and about a third boosted bonuses and benefits.

Despite those efforts, 80% are currently having difficulty finding workers and a majority of respondents expect those difficulties to persist. Plus, 83% of contractors worry the shortage and resulting inexperienced skilled labor pool will pose a challenge to the safety and health of their firm’s workers — the biggest threat respondents identified by far.

Cultivating new workers will take time and effort, according to Pittsford, Vermont-based Casella Construction co-founder John Casella.

“I think a lot of the easy levers have been pulled from a wage and a benefits standpoint, and now we’re really needing to look at all the things that no one’s talking about, with demographics and culture and what our jobs look like,” Casella said during the webinar.

Infrastructure a bright spot

While the outlook is more dim for private jobs, contractors are optimistic about infrastructure and other public work, the survey shows. That optimism is widespread even though only 5% of

1. Compared to 2022, do you expect the available dollar value of projects you compete for in 2023 to be higher/lower/about the same (answer for all market areas in which your business operates): Responses: 1,021

Market	Higher	Lower	Same	Net*	2022 Net
Bridge/Highway	50%	9%	41%	42%	57%
Transportation (e.g., transit, rail, airport)	52%	11%	37%	42%	51%
Water/Sewer	48%	11%	41%	38%	50%
Federal (e.g., VA, GSA, USACE, NAVFAC)	49%	11%	40%	37%	37%
Other Healthcare	42%	14%	43%	28%	41%
Power	41%	14%	45%	28%	35%
Hospital	40%	16%	44%	23%	38%
Public Building	39%	16%	44%	23%	20%
K-12 School	37%	20%	43%	16%	19%
Higher Education	36%	20%	44%	16%	16%
Manufacturing	39%	25%	37%	14%	27%
Data Center	35%	22%	43%	12%	-
Warehouse	36%	26%	38%	10%	41%
Other	26%	16%	59%	10%	-
Multifamily Residential	35%	34%	32%	1%	32%
Lodging	28%	32%	39%	-4%	6%
Private Office	22%	43%	35%	-21%	-8%
Retail	22%	44%	34%	-22%	-8%

*Net equals difference between number of “Higher” and “Lower” responses as percent of total.

Overall, contractors expect the value of infrastructure projects to rise, and for lodging, office and retail to slump in 2023. *Courtesy of AGC*

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What's keeping contractors up at night?

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respondents are working on new projects funded by the infrastructure act, while 6% have won bids but have not started work. Another 5% have bid on IJIA projects but haven't won awards yet, while 21% said they plan to bid on projects but nothing suitable has been offered so far.

AGC CEO Stephen Sandherr warned the IJIA's Buy America and labor stipulations are still unclear, and said that will make it harder for state and local jurisdictions to advance these projects.

"Federal officials need to deliver on the promise of these substantial new investments in infrastructure and construction," Sandherr said. "To do that, they will need to address much of the regulatory and permitting uncertainty that muted the hoped-for benefits of the bipartisan infrastructure law in 2022."

From [ConstructionDive.com](https://www.constructiondive.com)

2023 Construction Trends: What to Expect

By Alex Freeman

Published Dec. 19, 2022

The construction industry has undergone many changes in the past year. The industry had a great start in 2022 with four months of increased construction spending. Although the construction industry has improved, supply chain bottlenecks, inflation, and labor shortages remain significant challenges. Additionally, 93% of construction companies have vacant positions, according to a study done in 2022 by the Associated General Contractors of America (AGC) and Autodesk.

While some challenges will continue into 2023, construction companies can also expect positive changes. Let's look at some construction trends to keep an eye on in 2023.

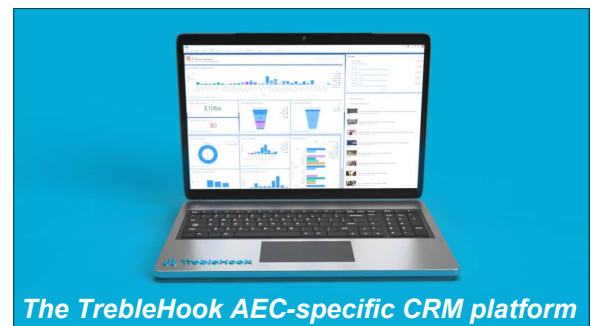
For the sake of this article, we have broken down the trends into three separate categories:

- **Transformation in the construction industry:** economic and global shifts impacting the industry
- **The future of the construction industry:** how construction is changing
- **Innovation within the industry:** how firms are managing data and adopting new technology

1. 2023 Construction Trends: Transformation in the Construction Industry

Construction companies are using data analytics to make smarter decisions that will lead to more successful outcomes.

The construction industry is welcoming a brave new world of data-driven insights to optimize their processes, accurately predict project costs and navigate challenges. By leveraging the power of analytics, companies can make smarter decisions that increase efficiency and reduce risks – paving the way for more successful outcomes.



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2023 Construction Trends: What to Expect

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Firms are bracing for the future with cutting-edge solutions that elevate how they manage projects and make decisions. With these systems, firms can access real-time data across several sources to maximize efficiency – meaning jobs get done quicker than ever before. By connecting ERP & project management into one unified platform, construction companies will be well-equipped to achieve success in bidding on profitable projects, marketing strategies, and driving sales growth like never before.

The construction industry is seeing changes in the way work is done, with a focus on incorporating green technology and reducing environmental impact.

The construction industry is seeing changes in the way work is done. Artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) are all becoming more prevalent. At the same time, construction companies are finding ways to reduce their carbon footprint by incorporating green construction technology, such as sustainable materials and efficient construction processes.

Firms are also working to reduce their environmental impact by reducing resource consumption and CO2 emissions. Upending current business models is no easy feat because they are so fixated on growth. However, technology is helping firms change how they design, build and operate things. Additionally, there are government-subsidized projects in 2023 designed to provide benefits to businesses willing to invest in a greener and more efficient future.

The construction industry is shifting towards quality, where owners are willing to pay more for better-quality assets.

This shift will impact construction materials, processes, and labor – all of which must be top-notch to ensure customer satisfaction.

Construction companies must invest in the right technology and workforce. For example, construction firms can leverage automation to improve material efficiency and quality. Additionally, construction companies must hire skilled workers – from construction managers to laborers – to ensure the highest-quality output.

Architecture, Engineering, and Construction (AEC) firms are paving the way for a brighter future by forging connections between the built environment and communities.

By bridging these connections, businesses are finding new opportunities for creating projects that meet their specific design goals and benefit the wider community by enriching public spaces and improving urban life.

This integration happens through designing functioning landscapes that add value to the neighborhood, identifying ways to eliminate threats to its residents or visitors, and incorporating elements such as art installations that help make the area more vibrant.

Doing so brings both short-term economic gains and long-term impacts on public health and well-being. AEC firms can play an important role in connecting their projects with civic needs by constructing facilities with multiple benefits, such as green spaces that can be used for recreation and actively engaging with stakeholders to create an inclusive vision for the future.

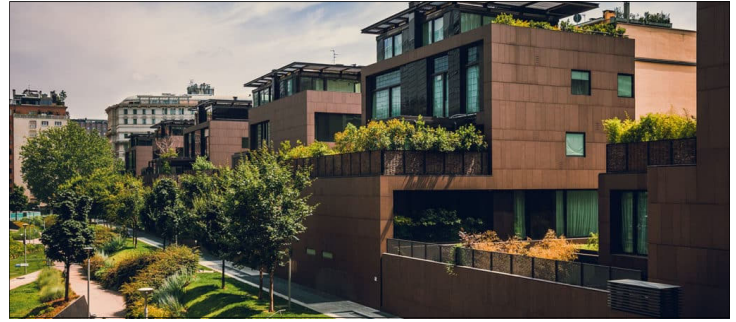
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2023 Construction Trends: What to Expect

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Construction firms are investing in technology to provide their customers with greater convenience and protection.

Construction firms have begun to see the value in investing in new technologies, and it is slowly becoming the industry standard. By embracing modern systems for planning, monitoring, and communication, businesses can maximize efficiency and safety in their projects.



Many construction companies have adopted digital designs for their projects, eliminating the need for physical prototypes. This helps businesses complete projects faster and improves the accuracy of plans from the start. Additionally, integrating mobile features into schedules and task lists can keep workers on track while away from the office. Investing in technology is helping construction firms gain an edge over the competition while providing greater convenience and protection for their customers.

2. 2023 Construction Trends: The Future of the Construction Industry

AR and VR are becoming more popular, with many companies implementing them into their training programs.

The construction industry is seeing tremendous benefits from implementing augmented and virtual reality applications into their training programs. Augmented reality allows workers to view detailed instructions on a job site without switching between multiple physical documents. And thanks to the improved clarity, users can better follow meaningful instructions and gain a deeper understanding of tasks.

With virtual reality, users can experience simulated construction scenarios in a safe environment where they can practice for real-life challenges and hone their skills without incurring any risks during an actual operation.

Companies are investing significantly in this technology and taking steps towards creating reliable digital systems that provide immersive learning experiences with interactive visualizations and simulations to increase efficiency, education, and safety in the workplace.

AI will play a significant role in increasing productivity and managing project schedules in the construction industry.

Artificial intelligence (AI) has the potential to revolutionize the construction industry, as it has in so many others. By providing detailed insights and real-time analytics into project schedules, AI can streamline the decision-making process and increase productivity through better management of resources, task delegation, and scheduling.

Leveraging powerful data processing capabilities and advanced algorithms, AI can also help anticipate problems in project implementation and adapt accordingly before issues become costly. This will enable project managers to access all the information they need when managing tasks, thereby increasing their and their team's efficiency. With AI, the construction industry benefits greatly from improved project planning, quality control, and safety assurance.

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2023 Construction Trends: What to Expect

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Robotics is growing and will help workers be more efficient.

Robotics has revolutionized the construction industry as companies have rapidly adopted robotic solutions to handle various complex tasks. By introducing robotic machines onto building sites, companies can reduce costs, eliminate risks, and increase productivity, resulting in shorter project times.



With robots taking over hazardous or physically challenging tasks, workers can now focus on the more intricate aspects of the job with less exertion needed. Worker safety is improved due to the higher accuracy of robotic tasks compared to human labor, and it goes without saying that this improved precision yields better results. Robotics is growing within the construction industry as companies recognize how robotics can produce a better outcome while saving them time and money.

The future of construction will be driven by pre-fabrication and modular building methods.

These methods have the potential to both reduce turnaround time for getting a structure built, as well as ensuring greater accuracy and reliability in the long run.

Pre-fabricated modules are done in factories, where expert teams work on quality assurance and can ensure that each component is exact and ready for on-site assembly.

Modular building techniques allow components to be standardized, reducing cost while ensuring predictable results. This combination of speed, efficiency, and accuracy makes pre-fabrication and modular building the way of the future in construction.

3. 2023 Construction Trends: Innovation Within the Industry

Construction companies in 2023 will focus on risk management, operational efficiencies, and faster payment cycles.

Risk management goals include reducing the probability of adverse events and minimizing the losses caused by them. Through closer monitoring of their activities, contractors and subcontractors may work together to identify potential risks before they become unmanageable.

Operationally, companies can reach new heights in 2023 through increased automation that helps streamline operations and coordinate multiple job sites. Moreover, technology-enabled solutions like virtual data rooms significantly improve payment cycle time, making construction projects easier to manage financially. As we move into 2023, construction companies must strive for excellence in risk management, operational efficiency, and faster payments to keep up with the increasing competition of recent years.

The most significant trend in construction is the increasing use of digital technology.

As the construction industry continues to adopt digital technologies at an encouraging pace, the ability to collect, analyze and validate data is becoming increasingly important. With it comes many innovative possibilities that can give organizations a competitive edge.

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2023 Construction Trends: What to Expect

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For example, real-time project performance analysis will help organizations better understand their operational processes. Central data warehouses allow teams to easily access and draw meaningful insights from various project components. This data-driven approach also helps optimize the procurement process by allowing companies to monitor material usage in different phases of development. Consequently, organizations may be able to cut costs and improve efficiency with greater accuracy than ever before.

Automation is the way of the future, specifically in data management.

Data management automation is becoming increasingly popular in the construction industry and is quickly revolutionizing building construction. Construction companies that employ automated data management systems can maximize efficiency while streamlining complex tasks, allowing them to be completed faster than ever before.

By connecting data sensors and smart machinery directly to this platform, project managers can collect real-time analytics, giving a clear picture of every stage of the construction process and pinpointing any potential problems before they arise. With this level of data collection, feedback loops can be created for effective decision-making, ensuring projects stay on budget and adhere to timeline goals.

By pushing the boundaries of innovation, automation in data management has provided opportunities and advantages previously not possible in construction – opening the door for smarter building processes with more accuracy and control than ever before.

The cloud is changing the construction industry by allowing real-time data sharing and better collaboration.

The cloud is revolutionizing the way that the construction industry operates. By allowing real-time data sharing across multiple platforms, project collaboration and communication are drastically improved, leaving teams with a better understanding of project goals and outcomes.

Autodesk Construction Cloud has proven to be a major game-changer in this space, uniting design, construction, and operations with powerful cloud-native solutions that enable effective collaboration without geographical limitations. With its easy access to real-time data analysis and forecasting capabilities, Autodesk Construction Cloud provides teams with invaluable insight into their projects, allowing them to drive profitable outcomes and better plan for the industry's future.

Be Ahead of Construction Trends in 2023 and Beyond

Construction firms are under pressure to do more with less. By focusing on data and analytics, construction companies can make smarter decisions about their projects, reduce environmental impact and improve project quality. The construction industry's future lies in augmented reality, virtual reality, robotics, and data.

By using these technologies, firms can reduce risks, increase operational efficiencies and create faster payment cycles.

– From [TPM.com](https://www.tpm.com)

It Is Not One World

Help wanted ... still. AGC survey points to labor shortages as biggest challenge for construction companies in 2023

By Dan Rafter

Published Jan. 11, 2023

The biggest challenge facing the construction industry in 2023? Finding enough workers to staff their job sites.

That's one of the key findings from the 2023 Construction Hiring & Business Outlook report released earlier this year by the Associated General Contractors of America (AGC).

A total of 80% of respondents cited in the AGC report said that they are struggling to fill some or all their salaried or hourly craft positions. Only 8% told the AGC that they were having no difficulty in finding enough workers.

This challenge shouldn't be a surprise to anyone who's followed the construction industry. Ken Simonson, chief economist with the Associated General Contractors of America, said that the construction industry's hiring challenges stretch back decades, starting when schools began scrapping their vocational education programs and guidance counselors and parents began steering students to college degrees and indoor jobs.

"It's been a chronic issue," Simonson told *Midwest Real Estate News* in an interview.

The issue has persisted even though the construction industry has generally paid its workers well for entry-level jobs, Simonson said. He pointed to numbers from the Bureau of Labor Statistics showing that for 20 years through 2019 construction jobs paid a premium of about 21.5% to people entering the workforce directly after high school.

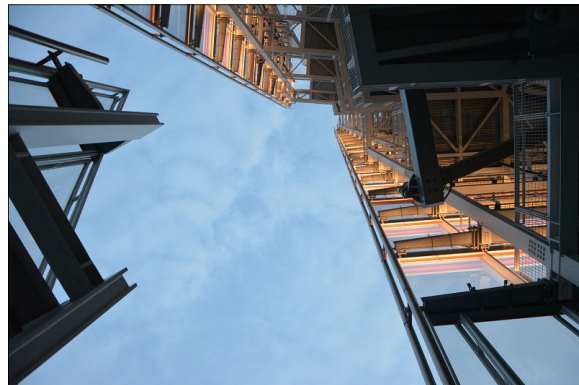
When the COVID-19 pandemic hit, the demand for restaurant, delivery and warehouse workers surged. That led these employers to boost their pay rates, too. That reduced the premium that construction workers were earning, with Simonson saying that the wage premium for construction jobs fell to as low as 15% during the height of the pandemic when compared to other jobs that employees could land directly after high school.

This dip in the wage premium further reduced the number of workers interested in jumping into the construction industry, Simonson said.

The pay for construction jobs is rising again, increasing at a faster rate than is the pay for other work, Simonson said. Simonson cited Bureau of Labor Statistics' numbers showing that the average hourly wage for construction jobs was up 6.1% from December of 2021 to December of last year. During this same period, the average wage for all jobs in the private sector jumped by just 5%.

Even with these higher wages, though, construction firms are struggling to fill their openings, Simonson said. Simonson said that throughout 2022 the number of job openings at the end of each month set a record for that month.

In the AGC survey, 69% of respondents said that they expect to increase their headcount of employees in 2023. At the same time, though, these respondents recognize that doing this will be challenging. A total of 58% of respondents said that hiring will continue to be hard or will become harder. Only 15% said that filling open positions will become easier.



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Help wanted ... still.

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This challenge persists even though almost 75% of firms reported that they increased base pay rates more than in 2021. That's an increase of the 62% of firms that said that they increased pay more in 2021 than in 2020.

With higher pay rates, what is keeping more workers from taking jobs in the construction industry?

"The pandemic has changed people's choices in some ways," Simonson said. "Job openings have been running at record levels. Openings have come down somewhat from the peak but are still running much higher than before the pandemic. Preferences have shifted, too. People have gotten used to working from home or on a hybrid basis with flexible hours. That isn't possible when you are working on construction sites. Maybe you have a greater need to be close to your kid's school. You don't get that if you are at the top of a crane."

Other challenges

Finding labor isn't the only challenge that construction companies face this year. Rising construction costs continue to make building everything more challenging, Simonson said.

The good news? Simonson said that rising materials costs are either moderating or tapering. That will bring some financial relief to construction companies this year. But prices are still high. Simonson pointed to data showing that as of November of last year the cost of non-residential construction materials and services was up 10.1% when compared to the same month a year earlier.

At the same time, the rate of inflation was about 7.1%, Simonson said.

"Construction is experiencing steeper cost increases than are consumers and most businesses," he said.

What has changed is which materials are costing more today. About 18 months ago, the costs of all materials seemed to be on the rise, Simonson said. Today, there has been a drop in the cost of materials such as lumber, steel, aluminum and copper. The cost of other materials, though, is on the rise, including gypsum, he said.

Long lead times continue to be challenging, too. Simonson said that the delivery times for transformers, switch gear and other electrical products have stretched to more than two years in some cases.

"Contractors are optimistic about the construction outlook for 2023, yet they are expecting very different market conditions for the coming year than what they experienced last year," said Stephen Sandherr, the association's chief executive officer, in a written statement. "Even as market demand evolves, contractors will continue to be confronted by many of the challenges they faced in 2022, including the impacts of supply chain problems and labor shortages."

The impact of rising interest rates

As with everyone working in commercial real estate, contractors are worried about rising interest rates. Simonson said that AGC members surveyed said that they were still optimistic about the construction industry overall. But they were less optimistic than they were a year ago.

Simonson said that contractors are confident that even with rising rates, they will still be busy in 2023 with infrastructure and federal projects. Contractors were especially confident that highway and bridge work will remain busy categories this year. They expected, too, that they would be busy tackling airport, rail and port construction projects.

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Help wanted ... still.

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Where contractors were less optimistic? Private construction work. Simonson said that survey respondents expect the amount of private construction work to slow this year.

Simonson said that he expects a continued slowdown in single-family housing construction this year. He also said that he expects construction activity to slow in any investor-financed categories, including apartments, warehouse, lodging, retail and office.

On the positive side, Simonson said that he expects higher demand for new manufacturing facilities in the United States.

"We've already seen these enormous semiconductor fabrication plants being built," Simonson said. "We are seeing the construction of elective vehicle plants. Other forms of manufacturing are being brought back to the United States. Manufacturing is already strong and should get even stronger in 2023."

Even with these opportunities, though, many contractors are expecting a wilder ride this year. According to the AGC survey, 36% of respondents said that they have had a project delayed or canceled and not yet rescheduled. A total of 13% had already experienced a delay or cancellation for a project scheduled in the first part of 2023.

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"Collaboration is important not just because it's a better way to learn. The spirit of collaboration is penetrating every institution and all of our lives. So learning to collaborate is part of equipping yourself for effectiveness, problem solving, innovation and life-long learning in an ever-changing networked economy."

~ Don Tapscott, author of *The Digital Economy*

**Is your data and info Current,
Accurate, Complete, Repeatable,
Auditable and Compliant[®]?**

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Just for Fun: February's Notable Events and Famous Birthdays

1 — Actor Clark Gable (1901), singer Rick James (1948) and MMA fighter Ronda Rousey (1987) were born, and the space shuttle Columbia broke apart (2003)

2 — The Mexican-American War ended (1848), baseball's National League was founded (1876), Groundhog Day was first celebrated (1887), and actress Farrah Fawcett (1947), model Christie Brinkley (1954) and **singer Shakira** (1977) were born



3 — Actor Nathan Lane was born (1956), and musicians Buddy Holly, Ritchie Valens and Big Bopper died in a plane crash (1959)

4 — The American Revolutionary War officially ended (1783), aviator Charles Lindbergh (1902), and civil rights activist Rosa Parks (1913) were born, Disney released Snow White and the Seven Dwarfs (1938), singer Alice Cooper (1948) and football star Lawrence Taylor (1959) were born, and Facebook was launched (2004)

5 — United Artists was formed (1919), and baseball legend Hank Aaron was born (1934)

6 — Baseball legend Babe Ruth (1895), President Ronald Reagan (1911), and singer Bob Marley (1945) were born, and Elizabeth II was crowned Queen of England (1952)

7 — Author Charles Dickens (1812), singer Garth Brooks was born (1962), the Beatles played their first concert in the U.S. (1964), comedian Chris Rock (1965) and actor Ashton Kutcher (1977) were born, and the Soviet Union collapsed (1990)

8 — The Boy Scouts of America was founded (1910), actor James Dean was born (1931), **Jay Berwanger was the first player selected in the first NFL draft** (1936), and football player Julio Jones (1989) and basketball player Klay Thompson (1990) were born



9 — President William Henry Harrison was born (1773), volleyball was invented (1895), Daylight Saving Time was instituted (1942), actor Joe Pesci was born (1943), the Hollywood Walk of Fame opened (1960), and the first American troops were sent to Vietnam (1965)

10 — The fire extinguisher was invented (1863), and golfer Greg Norman was born (1955)

11 — Inventor Thomas Edison (1847), actor Burt Reynolds (1936), singer Sheryl Crow (1962) and actress Jennifer Aniston (1969) were born, singer Whitney Houston died (2012), and the World Health Organization named the COVID-19 virus (2020)

12 — President Abraham Lincoln and biologist Charles Darwin (1809), basketball legend Bill Russell (1934), and football star DeMarco Murray (1988) were born

13 — TV host Jerry Springer (1944), basketball coach Mike Krzyzewski (1947) and football star Randy Moss (1977) were born

14 — St. Valentine was martyred (270), Alexander Graham Bell invented the telephone (1876), the St. Valentine's Day Massacre took place in Chicago (1929), and football star Alshon Jeffery was born (1990)

15 — Inventor Galileo Galilei (1564) was born, the Spanish-American War began (1898), the first Teddy Bear was made (1903), Disney's "Cinderella" opened in theaters (1950), the entire U.S.

figure skating team was killed in a plane crash (1961), Canada adopted the maple leaf flag (1965), and hockey star Jaromir Jagr was born (1972)

16 — King Tut's tomb was opened (1923), singer/politician Sonny Bono was born (1935), Nylon was invented (1937), rapper/actor Ice T was born (1958), the 9-1-1 system went into service (1968), and football star Jerome Bettis was born (1972)

17 — Football legend Jim Brown was born (1936), the first weather satellite was launched (1959), and comedian Larry the Cable Guy and basketball legend Michael Jordan were born (1963)

18 — "The Adventures of Huckleberry Finn" was published (1885), the first Academy Awards winners were announced (1929), the first 3-D movie opened (1953), actor John Travolta (1954), and rapper Dr. Dre (1965) were born, and race car legend Dale Earnhardt was killed in an accident at Daytona (2001)

19 — Astronomer Copernicus was born (1473), Thomas Edison invented the phonograph (1878), and singer Smokey Robinson (1940), actor Jeff Daniels (1955), and singer Seal (1963) were born

20 — The U.S. Postal Service was established (1792), **John Glenn became the first American to orbit Earth** (1962), and basketball star Charles Barkley (1963), singer Kurt Cobain (1967), baseball star Justin Verlander (1983), and singer Rihanna (1988) were born



21 — The sewing machine was invented (1842), Karl Marx published his "Communist Manifesto" (1848), NASCAR was incorporated (1948), DNA was discovered (1953), actor Kelsey Grammer was born (1955), and Malcolm X was assassinated (1965)

22 — President George Washington was born (1732), the Republican Party held its first national meeting (1856), basketball legend Julius "Dr. J." Erving was born (1950), the first Daytona 500 was held (1959), actress Drew Barrymore was born (1975), and the U.S. Olympic hockey team beat the USSR in the "Miracle On Ice" (1980)

23 — Plutonium was first produced (1941), the iconic flag raising on Iwo Jima occurred (1945), and actress Dakota Fanning was born (1994)

24 — Andrew Johnson became the first U.S. president to be impeached (1868), and entrepreneurs Phil Knight (1938) and Steve Jobs (1955), and boxer Floyd Mayweather (1977) were born

25 — Samuel Colt invented the revolver (1836), the first American aircraft carrier was launched (1933), the first televised NHL game was broadcast (1940), guitarist George Harrison was born (1943), and Cassius Clay (Muhammad Ali) beat Sonny Liston for the heavyweight boxing championship (1964)

26 — Singers Fats Domino (1928) and Johnny Cash (1932) were born, RADAR was first demonstrated (1935), and **the World Trade Center was bombed** (1993)



27 — The first Mardi Gras celebration in New Orleans was held (1827), and actress Elizabeth Taylor (1932), football star Tony Gonzalez (1976), and First Daughter Chelsea Clinton (1980) were born

28 — DNA was discovered (1953), and hockey star Eric Lindros (1973) and singer Jason Aldean (1977) were born