January 19, 2022

The Honorable Doug Parker
Assistant Secretary
Occupational Safety and Health Administration
U.S. Department of Labor
200 Constitution Ave., NW
Washington, DC 20210

RE: Occupational Safety & Health Administration COVID-19 Vaccination and Testing: Emergency Temporary Standard Docket No. OSHA-2021-0007

Dear Assistant Secretary Parker:

As the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) works to promulgate a permanent COVID-19 standard requiring all employers with 100 or more employees to ensure their workforce is either fully vaccinated against COVID-19 or mandate that any workers who remain unvaccinated produce a negative test result on at least a weekly basis, the Associated General Contractors of America (AGC), the American Road and Transportation Builders Association (ARTBA), and the Signatory Wall and Ceiling Contractors Alliance (SWACCA) respectfully put forth the construction industry's deep concerns with the current emergency temporary standard (ETS), and sensible recommendations for a permanent standard, assuming it is legally viable.

Since the outset of the pandemic, each association's members have made significant contributions to the nationwide effort to fight COVID-19. These efforts include funding and sponsoring public service announcements, education campaigns, and other positive and proactive measures to encourage employees to protect themselves against this pandemic. Among many other things, our members construct buildings, hospitals, schools, shopping centers, highways, bridges, tunnels, power lines, and both clean water and wastewater facilities across the United States. Our members are essential businesses that have continued to work from the beginning of the pandemic and have consistently taken both extraordinary and effective steps to protect their employees from COVID-19. Each association is keenly aware of the important role that COVID-19 vaccinations are now playing. Our concerns are not about the safety or efficacy of such vaccinations, which we consider to be valuable tools in the fight against COVID-19.

We raise concerns about this ETS not because we oppose its objective, but rather, because it will be counterproductive insofar as it will cause badly needed employees to leave larger construction companies and perhaps the construction industry. The resulting damage to these companies and the critical effort to reconstruct the nation's infrastructure would be great and irreparable. The construction industry is already facing a severe workforce shortage.

OVERVIEW

I. OSHA Should Have Exempted Construction Activities from this ETS Based on the Agency's own Exposure Assessments and Regulated Industry Sectors According to Risk

II. OSHA's Exemption for Outdoor Work is Unduly Narrow in that it Only Allows Contractors to Qualify on a Very Limited Basis, if at All

III. Broadly Applying the OSHA ETS to Contractors Employing 100 or More Employees Will Exacerbate the Workforce Shortage for Contractors subject to the ETS, Significantly Increasing Construction Project Costs and Delays in a Manner that Will Undermine the Economic Recovery and Implementation of the Bipartisan Infrastructure Law

IV. Broadly Applying the OSHA ETS to All Construction Activities Could Impede the Goal of Increased Vaccination Rates & Could Lead to Significant Supply Chain Delays for Testing

a. OSHA Underestimates the Ability and Willingness of Those Who Refuse the Vaccine or Testing to Find Work Elsewhere to Avoid this New Mandate Altogether, Impeding Efforts to Increase Vaccination Rates and Punishing Construction Businesses that Fall Under the Mandate

b. If a Significant Number of Construction Workers—or other Unvaccinated Workers in the United States—Choose Testing Over the Vaccine, there Could be Testing Supply Chain Issues that Threaten the Ability of ETS Covered-Construction Employers to Operate Safely & Efficiently

V. OSHA's 100 Employee Threshold Fails to Take into Consideration the Structure, Dynamics, and Seasonal Nature of the Construction Industry

VI. Conclusion

DISCUSSION

I. OSHA Should Have Exempted Construction Activities from this ETS Based on the Agency's own Exposure Assessments and Regulated Industry Sectors According to Risk

The construction industry is the delivery tool for building and maintaining critical infrastructure and facilities used to deliver clean water and electricity, protect our national security, and transport essential goods and services like medical supplies, groceries and, most recently, COVID-19 vaccines. Equally important, the construction industry has a long history of working to ensure the safety and health of its employees, even before the COVID-19 pandemic. Given the many precautions already in place on construction jobsites, the uniqueness of construction projects and their environment—which is completely different from an office workplace—applying the ETS mandate universally across all types of construction does not make sense.

OSHA has previously explained that the level of risk of occupational exposure to COVID-19 "depends in part on: the type of industry, the need for contact within 6 feet of people known to be, or suspected of being, infected with SARS-CoV-2; or requirements for repeated or extended contact with persons known to be, or suspected of being, infected with SARS-CoV-2."[1]

According to OSHA's own assessment, most construction work poses "low exposure risk." Construction work only crosses into "high exposure risk" when it takes place at indoor work sites occupied by other workers who are not engaged in construction, customers, or residents suspected of having or known to have

[1] Guidance on Preparing Workplaces for COVID-19, OSHA (2020) (available at https://www.osha.gov/sites/default/files/publications/OSHA3990.pdf).

COVID-19, including when an occupant of the site reports signs and symptoms consistent with COVID-19. Given the widespread adoption of company policies that prohibit employees exhibiting any type of symptoms consistent with COVID-19 from entering the workplace, the likelihood of such an occurrence is extremely low. Additionally, contractors generally do not perform work where customers or residents suspected of having or known to have COVID-19 are present.

Indeed, the January 13 Supreme Court decision supports such a risk-based approach to regulating hazards associated with workplace exposures to COVID-19:

> "That is not to say OSHA lacks authority to ***regulate occupation-specific risks related to COVID–19***. Where the virus poses a special danger because of the particular features of an employee's job or workplace, targeted regulations are plainly permissible. We do not doubt, for example, that OSHA could regulate researchers who work with the COVID–19 virus. So too could OSHA regulate risks associated with working in particularly crowded or cramped environments. But the danger present in such workplaces differs in both degree and kind from the everyday risk of contracting COVID–19 that all face. OSHA's indiscriminate approach fails to account for this crucial distinction— between occupational risk and risk more generally—and accordingly the mandate takes on the character of a general public health measure, rather than an "occupational safety or health standard." 29 U. S. C. §655(b) (emphasis added).

Construction work is unlikely ever to pose a "high exposure risk" or "very high exposure risk" (a risk category which OSHA does not believe is applicable for most anticipated construction work tasks).[2] We therefore recommend that OSHA follow its own assessments, as well as the opinion of the Court, and exempt most construction activities from this ETS and any subsequent permanent rule.

II. OSHA's "Exemption" for Outdoor Work is too Narrow Insofar as it Only Allows Contractors to Qualify on a Very Limited Basis, If at All

OSHA does exempt employees who work exclusively outdoors. This exemption is a modest acknowledgement of the obvious: that not all jobs carry an equal risk of infection. But this exemption is far too narrow to account for even the most obvious distinctions between the construction industry and other industries. As a threshold matter, the line between indoor and outdoor construction activity is a blurred one. And this fact leaves the exemption impossible to apply to much of the work that construction contractors perform in any consistent way. The black-and-white line that OSHA draws between indoor and "exclusively" outdoor work is far too simplistic to account for the construction of office buildings, apartments, hotels, hospitals, and the like. Floors and ceilings may be in place, but walls or windows are not. Some walls and windows may also be installed, but others are not, and at least until the structure is fully enclosed, the ventilation will continue to exceed anything one would expect to find in a typical office building. Much of the work on buildings is neither indoors nor outdoors in any obvious way. The agency's black-and-white line is too simplistic. It betrays the lack of a serious and credible effort to tailor the ETS to fit the unique characteristics of the construction industry, which OSHA has always understood to be different in many respects from all other industries.

The particulars of this exemption also create practical problems. Construction jobsites are not fixed locations. They come and they go, as current projects reach completion and new projects come along. It follows that field workers are constantly changing their often-lengthy commutes. One month, they are 45 minutes from home. The next month, they are more than 2 hours away. And to control the vagaries and costs of commuting, construction workers often share vehicles. To take advantage of the exemption, construction firms would have to prohibit that practice and compel each worker to pay for individual

[2] COVID-19 Control and Prevention: Construction Work, OSHA (available at https://www.osha.gov/coronavirus/control-prevention/construction) (last visited Feb. 23, 2021).

transportation. This not only imposes needless additional costs on individual workers, it also raises practical issues, such as limitations on parking spaces that may exist at some construction sites.

Other practical problems are even more severe. The construction industry's field workers must endure hot and cold working conditions, as weather changes from season to season. To qualify these workers for the "exclusively" outdoor exemption, construction firms would have to deny them the option of gathering indoors during their lunch or other breaks either to cool down or to warm up. Whatever the weather, they would have to remain outdoors for all but brief moments, possibly in conflict with existing regulations pertaining to exposure to heat or cold.

III. Broadly Applying the OSHA ETS to Contractors Employing 100 or More Employees Will Exacerbate the Workforce Shortage for Contractors subject to the ETS, Significantly Increasing Construction Project Costs and Delays in a Manner that Will Undermine the Economic Recovery and Implementation of the Bipartisan Infrastructure Law

The COVID-19 pandemic has taken its toll on the construction industry and many of its markets. The Omicron variant of the virus has many construction firms facing renewed economic and operational uncertainty. An industry survey[3] conducted by AGC [Attachment 1] in August 2021 identified the greatest cause of this uncertainty, finding that 89 percent of construction contractors are having a hard time finding craft workers. Additionally, 88 percent of firms are experiencing project delays and 93 percent are affected by rising material costs.

The survey results underscore how the pandemic has constrained the number of workers available to hire. The results also confirm that many contractors are facing delayed projects, construction materials shortages and delivery delays.

Unfortunately, this ETS mandate will exacerbate the workforce challenges for large construction employers and significantly increase project costs and delays. It will impede the economic recovery while diluting the value of significant funding increases authorized by the Infrastructure Investment & Jobs Act (IIJA). This is contrary to one of the primary goals of the ETS cited throughout the preamble—to eliminate the risk to the economy that the current surge of the Delta and Omicron variants pose. While increased vaccination rates will help address this concern, this ETS will not lead to more vaccinations in our industry. As the Census Bureau's December 28, 2021 Household Pulse Survey[4] explained, at this stage people who remain unvaccinated are mostly doing so out of concerns about the effects of the vaccine and a lack of trust in the vaccines and the government. We do not doubt that this is true of the unvaccinated individuals in our industry. Given these concerns, and the competition for workers in the construction industry across contractors, workers at construction firms covered by the ETS will be incentivized to find work at an employer that is not covered by the ETS and will have little trouble doing so. Our concerns about the potential loss of workers are similar to those voiced by the U.S. Postal Service that OSHA is currently considering.[5] As explained in more detail below, given the demand for workers in our industry, we do not think the financial incentives OSHA cites will overcome the concerns of these workers when they can find many jobs in our industry with employers who are not covered by the ETS.

IV. Broadly Applying the OSHA ETS to All Construction Contractors Could Impede the Goal of Increased Vaccination Rates & Could Lead to Significant Supply Chain Delays for Testing

[3] AGC of America. *Construction Workforce Shortages Reach Pre-pandemic Levels Even as Coronavirus Continues to Impact Projects & Disrupt Supply Chains.* (Available at https://www.agc.org/news/2021/09/02/construction-workforce-shortages-reach-pre-pandemic-levels-even-coronavirus-0

[4] Census Bureau Household Pulse Survey Phase 3.3, last accessed January 17, 2022 at https://www.census.gov/library/stories/2021/12/who-are-the-adults-not-vaccinated-against-covid.html

[5] Reuters, David Shepardson, *U.S. Postal Service Seeks Relief from COVID Testing, Vaccine Rules* January 6, 2022, Last accessed January 17, 2022 at https://www.reuters.com/world/us/us-postal-service-seeks-relief-testing-vaccine-rules-2022-01-05/

a. Do Not Underestimate the Willingness of Those Who Refuse the Vaccine or Testing to Find Work Elsewhere to Avoid this New Mandate Altogether, Impeding Efforts to Increase Vaccination Rates and Punishing Construction Businesses that Fall Under the Mandate

Despite continued efforts to promote or incentivize voluntary vaccination of construction workers, a significant number of contractors encounter vaccine skepticism. According to data from a continuous Facebook poll conducted by the Delphi Group of researchers at Carnegie Mellon University, for the week of Dec. 26, 2021-Jan. 1, 2022, 57.7% of respondents who identified their occupation as construction reported they had been vaccinated, compared to 84.1% of workers in all other occupations.

The figures have changed little since May 2021. Vaccine hesitancy has generally declined in the past two months, from 44.9% of construction respondents the week of Nov. 7-13, 2021, to 37.0% the week of Dec. 26-Jan. 1. These figures still represent a significant percentage of the construction workforce who remain unwilling to get COVID-19 vaccines.[6]

Our members justifiably fear that many of those workers—when faced with the choice between the vaccine and their job with a covered employer—will quit and go to work for an employer not covered under the ETS mandate. OSHA fails to recognize in the ETS that the majority of the construction industry is comprised of small businesses of fewer than 100 employees. And, as detailed above, so many firms are looking for workers, those workers could find employment with a contractor in need of their services with less than 100 workers and avoid the ETS vaccine or testing mandate altogether. OSHA also ignores the fact that employers just under the 100-employee level will be disincentivized to grow and add personnel because of the ETS' requirements.

The ETS is also not well designed to mitigate COVID-19 in the construction industry to the extent it only applies to workers employed by a contractor that meets the 100-employee threshold. It does not apply to a worker who may be on a multiemployer jobsite with hundreds of workers, few of whom are employed with a contractor large enough to be covered under the ETS. Most large construction jobsites have craft workers from numerous employers working alongside one and other. Few will be employed by a company with 100 or more employees subject to the ETS. But these covered workers will still be exposed on a regular and recurrent basis to workers on a jobsite from smaller subcontractors with no obligation to ensure they are vaccinated or tested. Non-construction workers, customers, and members of the public in and around such multiemployer projects will also be exposed to many construction craft workers who are not subject to the ETS.

b. If a Significant Number of Construction Workers—or other Unvaccinated Workers in the United States—Choose Testing Over the Vaccine, there Could be Testing Supply Chain Issues that Threaten the Ability of ETS Covered-Construction Employers to Operate Safely & Efficiently

If a majority of construction employees—or other unvaccinated workers in the United States—opt for the ETS' testing option instead of getting vaccinated, there will undoubtedly be a spike in demand for testing kits and, in turn, further strain laboratories to analyze these tests in a timely manner.

While the Administration pledges to increase the availability of testing kits, it is completely silent on how it intends to address the capacity of laboratories to analyze the increased number of anticipated tests in a timely and efficient manner for all Americans—not just employees. The unvaccinated population consists of a large number of children under the age of 12, many of whom have to be tested on a weekly basis to attend school. The Administration must ensure—without exception and no room for error—that any increase in demand for testing kits and laboratory capacity fueled by the ETS can be met, lest it jeopardize the safety, health, and well-being of the nation's unvaccinated school children.

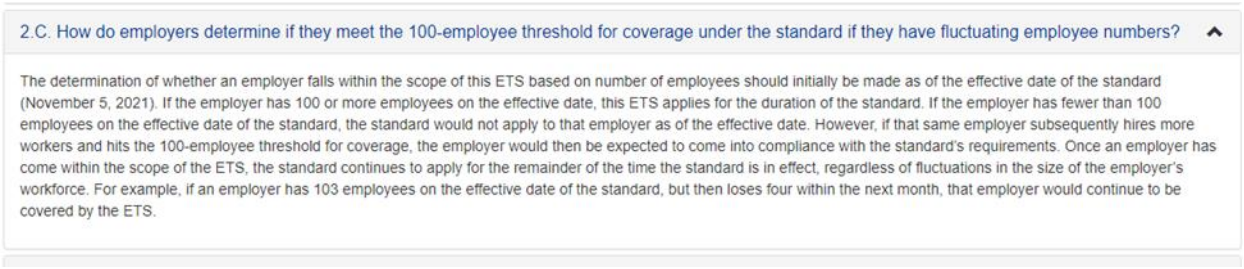
[6] The Center for Construction Research and Training (CPWR): COVID-19 Vaccination Dashboard. Available at: https://www.cpwr.com/research/data-center/data-dashboards/covid-19-vaccination-dashboard/

Similarly, the Administration cannot require construction employers to meet a testing mandate where there are shortages of testing kits and laboratory capacity. Even if vaccine holdouts remain at large employers covered by the ETS, any lack of test kits or laboratory processing capacity will force covered employers to sideline scarce workers and risk delaying or cancelling construction projects across the country. If workers are unavailable due to delays in receiving test results, the economic fallout will be enormous and could result in construction firms shutting down their operations or even going bankrupt.

OSHA excluded employers with under 100 employees from coverage under the ETS, in part, to allow time "to assess any impact the new requirements may have on the testing infrastructure and related supply chains before considering extending those requirements to additional employers." Issues with lack of availability of testing have already arisen and there is no indication they will be resolved any time soon. Therefore, we have serious reservations with OSHA potentially extending these requirements to even more employers.

V. OSHA's 100 Employee Threshold fails to Take into Consideration the Demographics, Dynamics, and Seasonal Nature of the Construction Industry

The number of employees within construction companies often varies throughout the year based on backlog, work in progress, and seasonal constraints. Per the ETS, if a company reaches one hundred employees (including union employees, part time employees, remote employees, outdoor employees) at any time while the ETS is in effect, the employer is generally subject to the ETS going forward even if its headcount subsequently falls below 100 workers, and even if less than 100 workers are subject to the vaccine or test requirements of the ETS because of applicable exemptions.



2.C. How do employers determine if they meet the 100-employee threshold for coverage under the standard if they have fluctuating employee numbers?

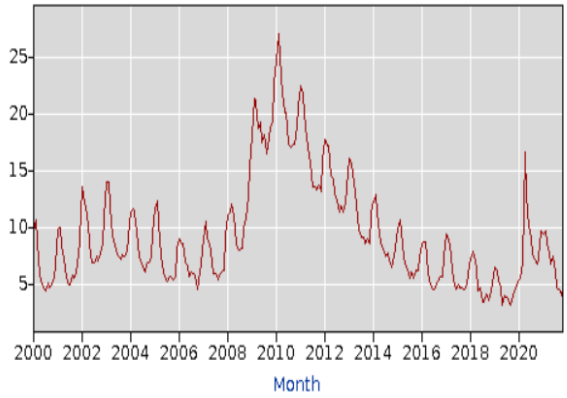
The determination of whether an employer falls within the scope of this ETS based on number of employees should initially be made as of the effective date of the standard (November 5, 2021). If the employer has 100 or more employees on the effective date, this ETS applies for the duration of the standard. If the employer has fewer than 100 employees on the effective date of the standard, the standard would not apply to that employer as of the effective date. However, if that same employer subsequently hires more workers and hits the 100-employee threshold for coverage, the employer would then be expected to come into compliance with the standard's requirements. Once an employer has come within the scope of the ETS, the standard continues to apply for the remainder of the time the standard is in effect, regardless of fluctuations in the size of the employer's workforce. For example, if an employer has 103 employees on the effective date of the standard, but then loses four within the next month, that employer would continue to be covered by the ETS.

OSHA gives the hypothetical example of a firm that has 102 total employees and only 3 ever report to an office location. Another example by OSHA is a firm that has 125 employees, and 115 of them work exclusively outdoors. Both firms would also be subject to the ETS even though they will not have to mandate testing for the remote workers or outdoor workers. The employers must still comply with other ETS' requirements and are subject to penalties for non-compliance.

The graphic below demonstrates the annual peaks and troughs associated with construction unemployment each year. A firm that has 100 employees in the summer might only have 30 employees in the winter, yet the firm will need to maintain the administrative burden of compliance with the ETS throughout the entire year, which is unfair and raises questions about OSHA's logic for not applying the rule to smaller employers.

Labor Force Statistics from the Current Population Survey

Series Id:	LNU04032231
Not Seasonally Adjusted	
Series title:	(Unadj) Unemployment Rate - Construction Industry, Private Wage and Salary Workers
Labor force status:	Unemployment rate
Type of data:	Percent or rate
Age:	16 years and over
Class of worker:	Private wage and salary workers
Labor force experience:	Experienced
Industry:	Construction



The above discussion further demonstrates how the agency's approach to regulating COVID-19 with a broad brush fails to consider not only the varying degrees of risk present in the covered industry sectors, but also the unique and dynamic nature of the construction industry.

To further expand on the reasonableness and relevance of the ETS as it relates to the construction industry, and to highlight the key differences between the construction industry and the other industries covered under the ETS, we have provided an expert declaration prepared by The Vertex Companies, Inc. as [Attachment 2] to our comments.

VI. Conclusion

To be clear, the ETS will have the unintended effect of causing further damage to the economy as well as unintended consequences on the health and safety of workers and other Americans. As the agency did with the health care ETS, OSHA must take the necessary time to carefully review the ETS and its impact on specific regulated industry sectors. The agency should not expedite the promulgation of an ETS or a permanent rule for the sake of fulfilling an obligation or avoiding public criticism. Instead, it should focus its efforts on the industry sectors that present the highest exposure risks.

In addition, after giving all aspects of such a standard due consideration, we strongly encourage the Administration to identify a firm "sunset" date to which the ETS will expire.

AGC, ARTBA and SWACCA remain committed to working with OSHA to help ensure safe, healthy and efficient construction workplaces. We thank you for your consideration of our concerns and recommendations.

Sincerely,

Associated General Contractors of America
American Road and Transportation Builders Association
Signatory Wall and Ceiling Contractors Alliance

Attachment 1

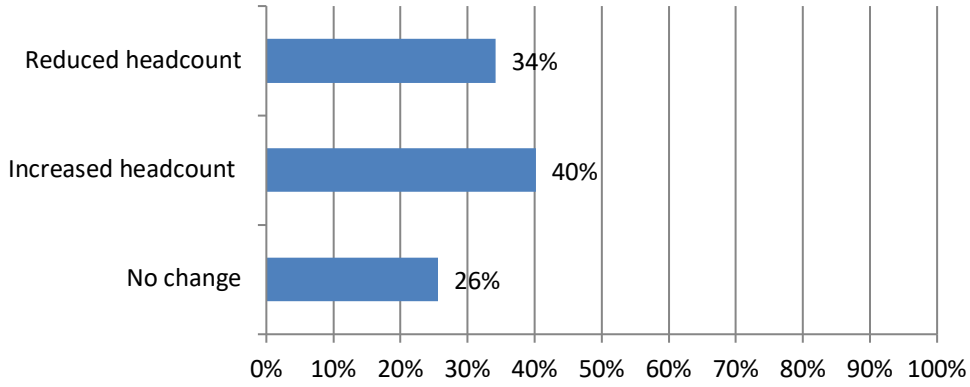
AGC 2021 Workforce Survey Results

2021 Workforce Survey Results

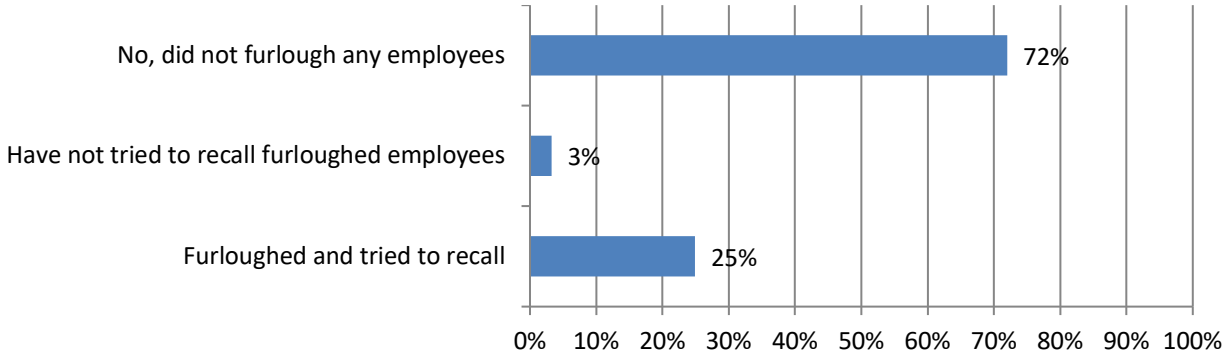
National Results

Total responses: 2,136, but number varies by question.

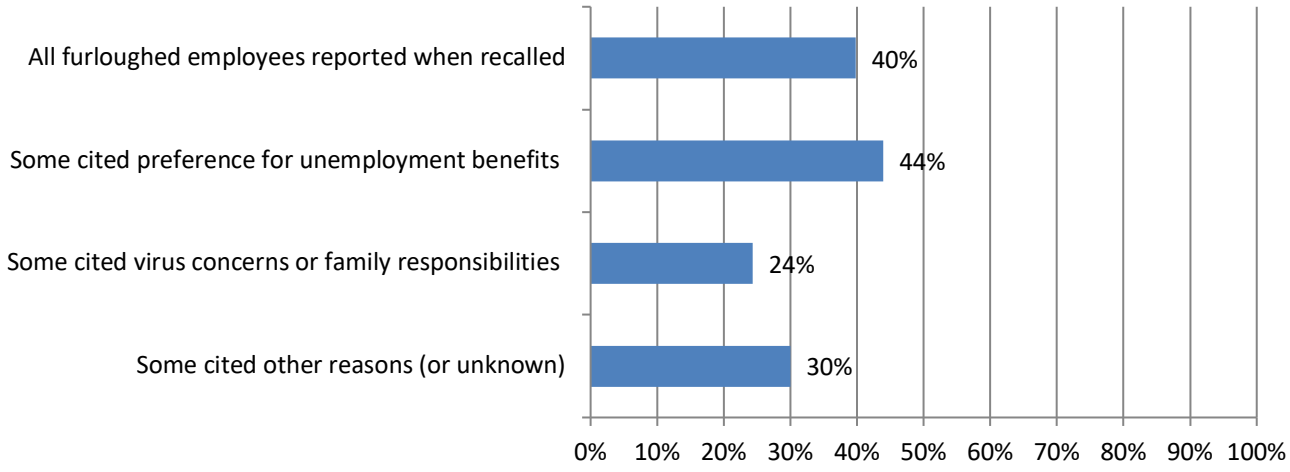
1. By what percentage has your firm's headcount changed in the past 12 months? Responses: 2,134



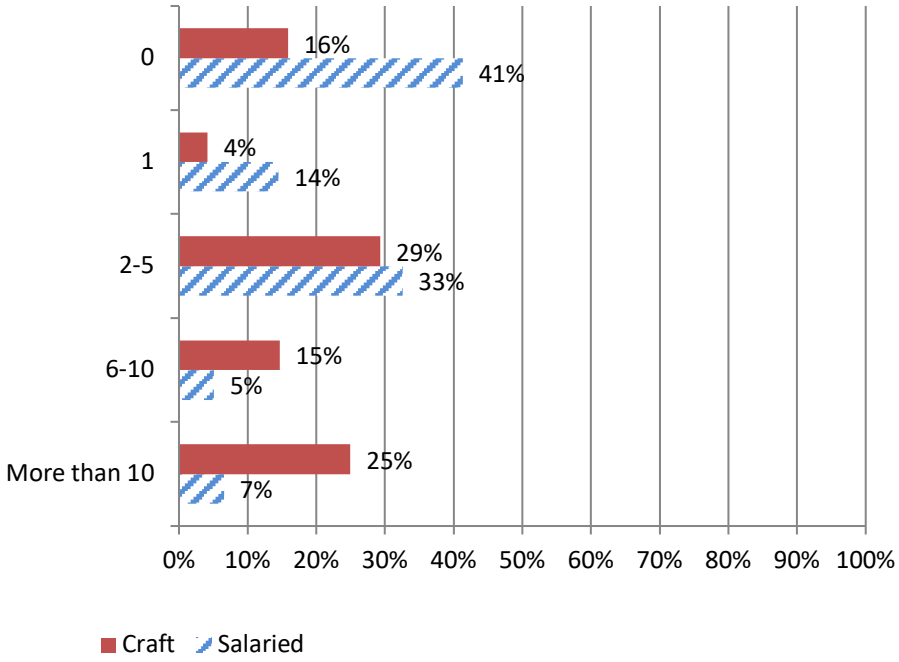
2. Did you furlough employees and then recall any in the past 12 months? (Mark all that apply) Responses: 2,128



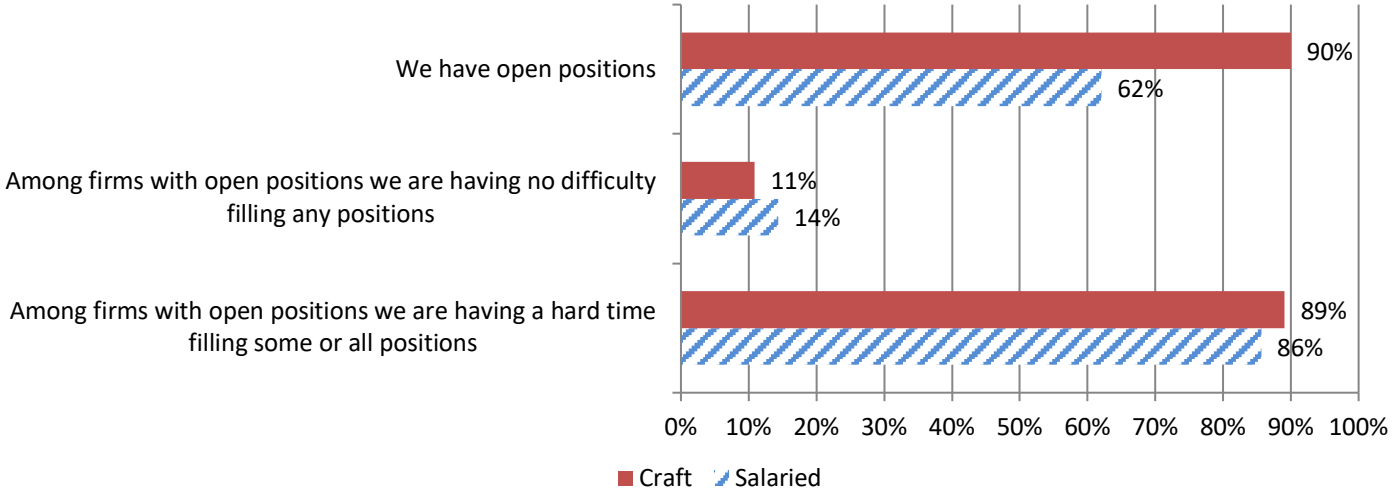
3. Among firms that tried to recall employees; Response: 530



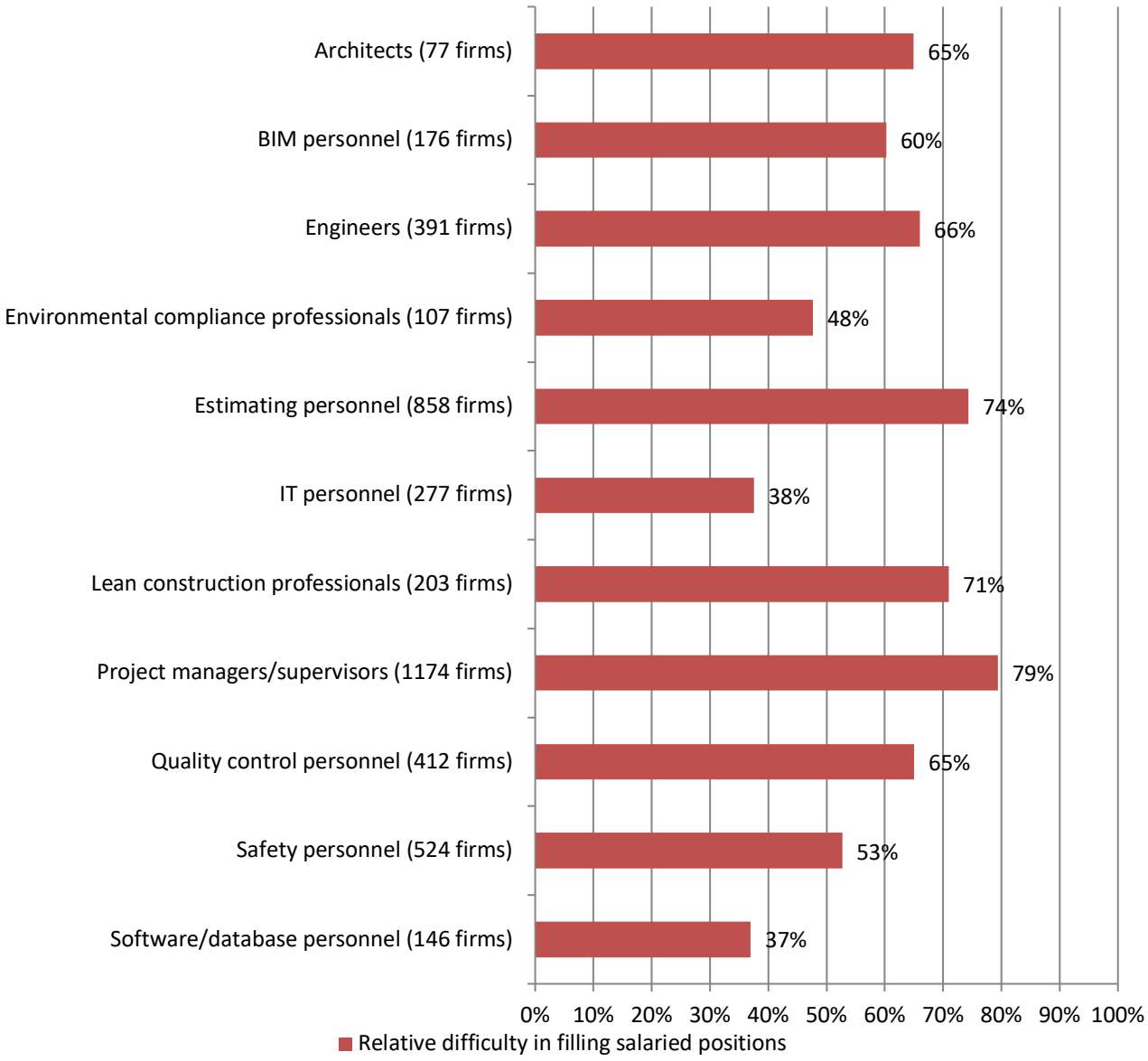
4. **How many unfilled hourly craft or salaried positions did you have on June 30, 2021? Responses: 1960 Salaried; 1958 Craft**



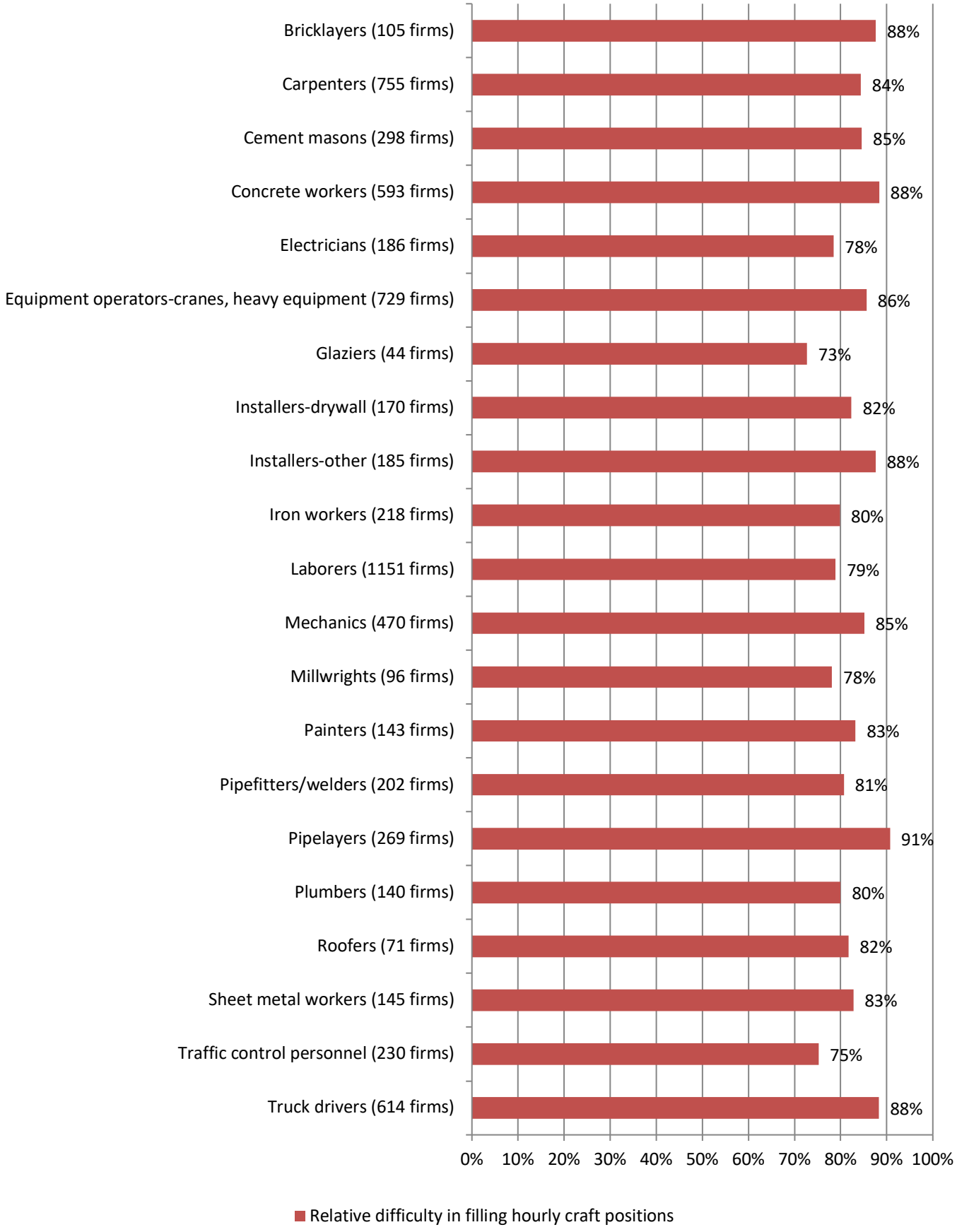
5. **How would you describe your current situation in filling hourly craft or salaried positions? Responses: 1,952 Salaried; 1,642 Craft**



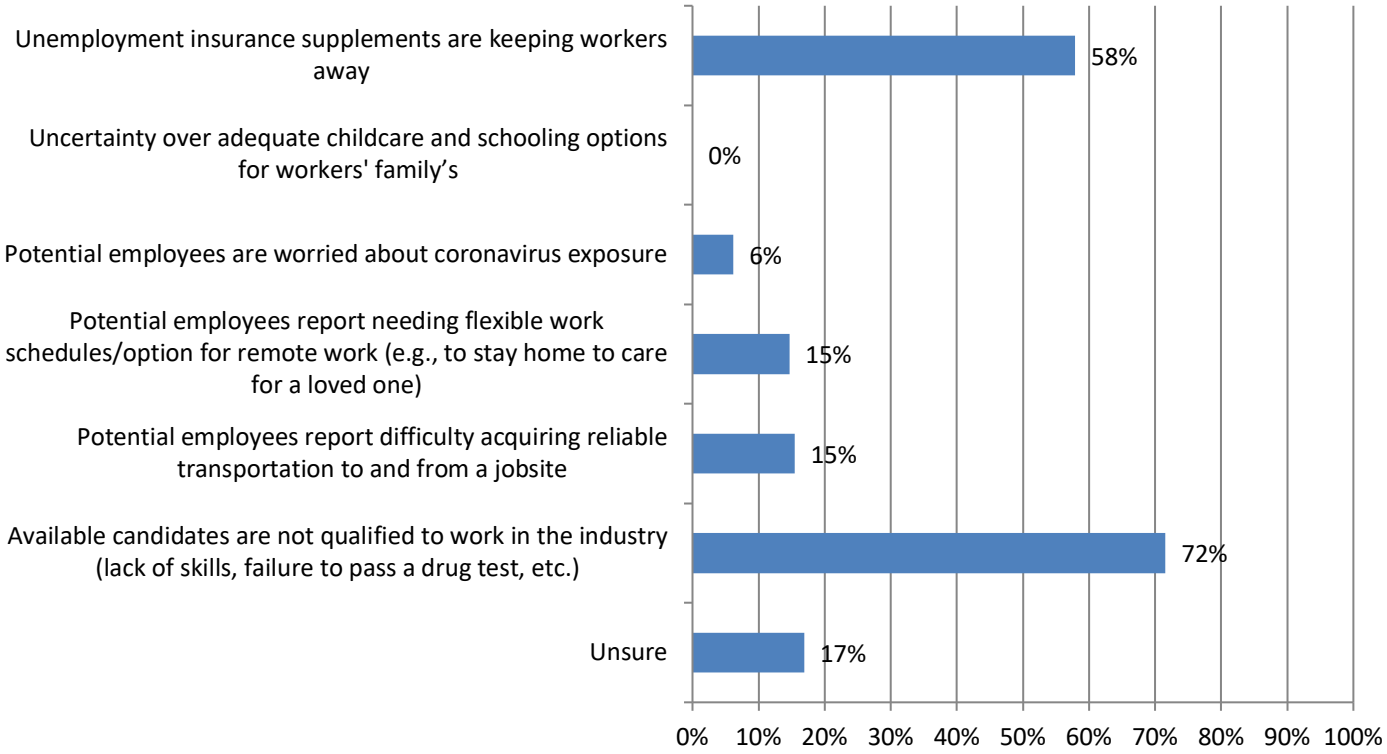
6. **If your firm is having trouble filling <u>salaried</u> positions, please indicate all the position types you are having trouble filling (Mark all that apply): 1,651**



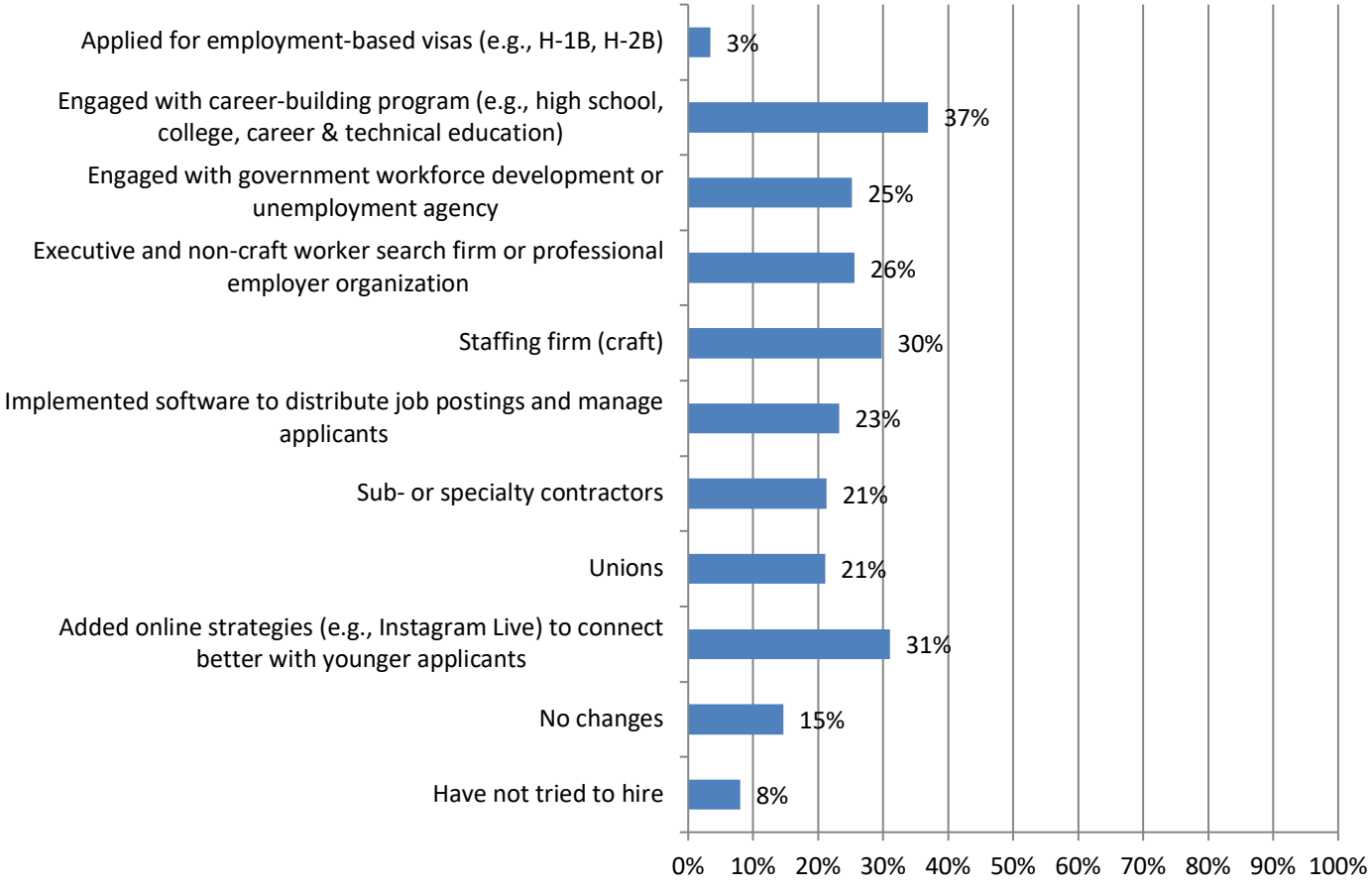
7. If your firm is having trouble filling <u>hourly craft</u> positions, please indicate all the position types you are having trouble filling (Mark all that apply). Responses: 1,651



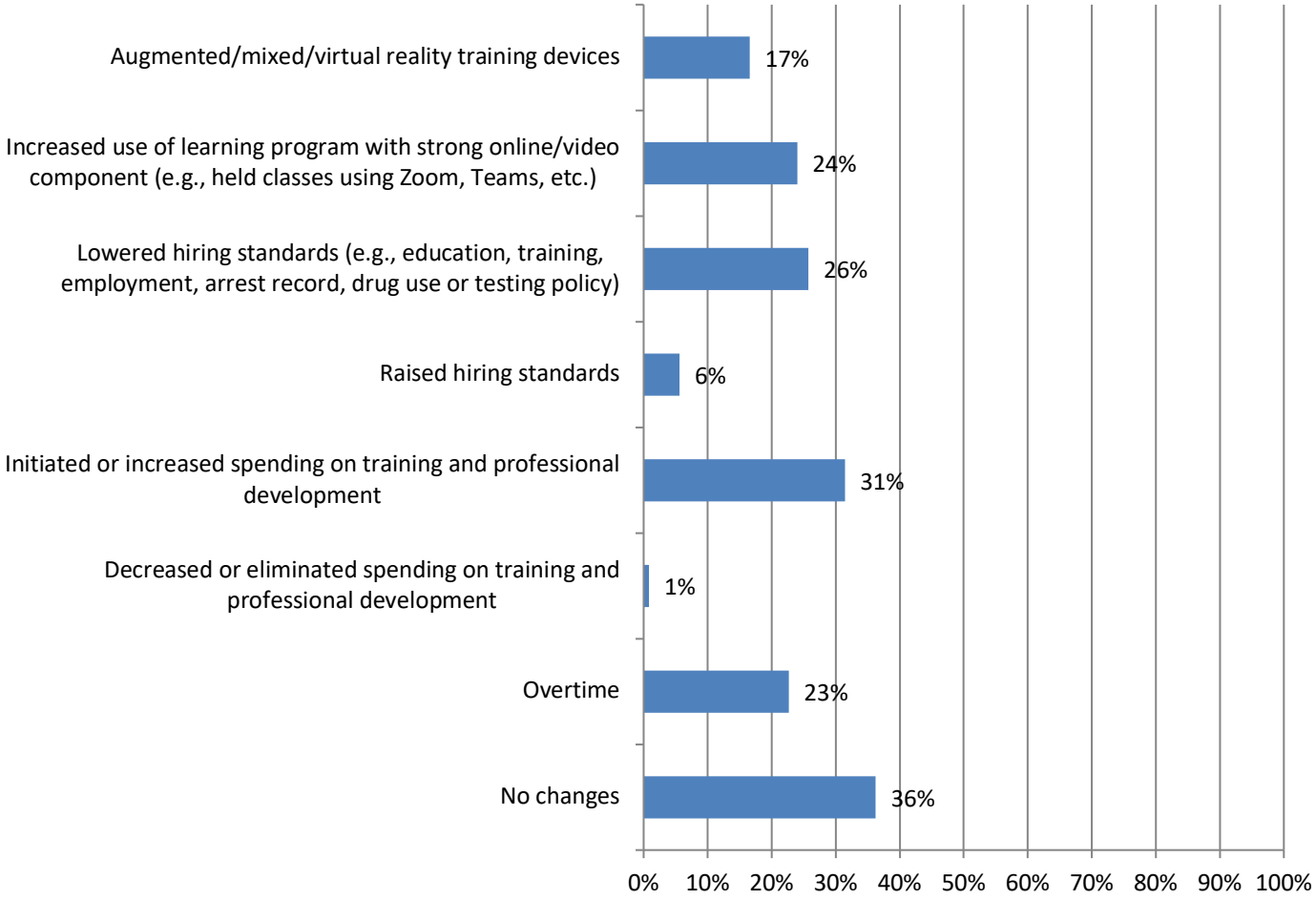
8. If you are having a hard time filling available positions, what are the reason(s)? (Mark all that apply) Responses: 1,778



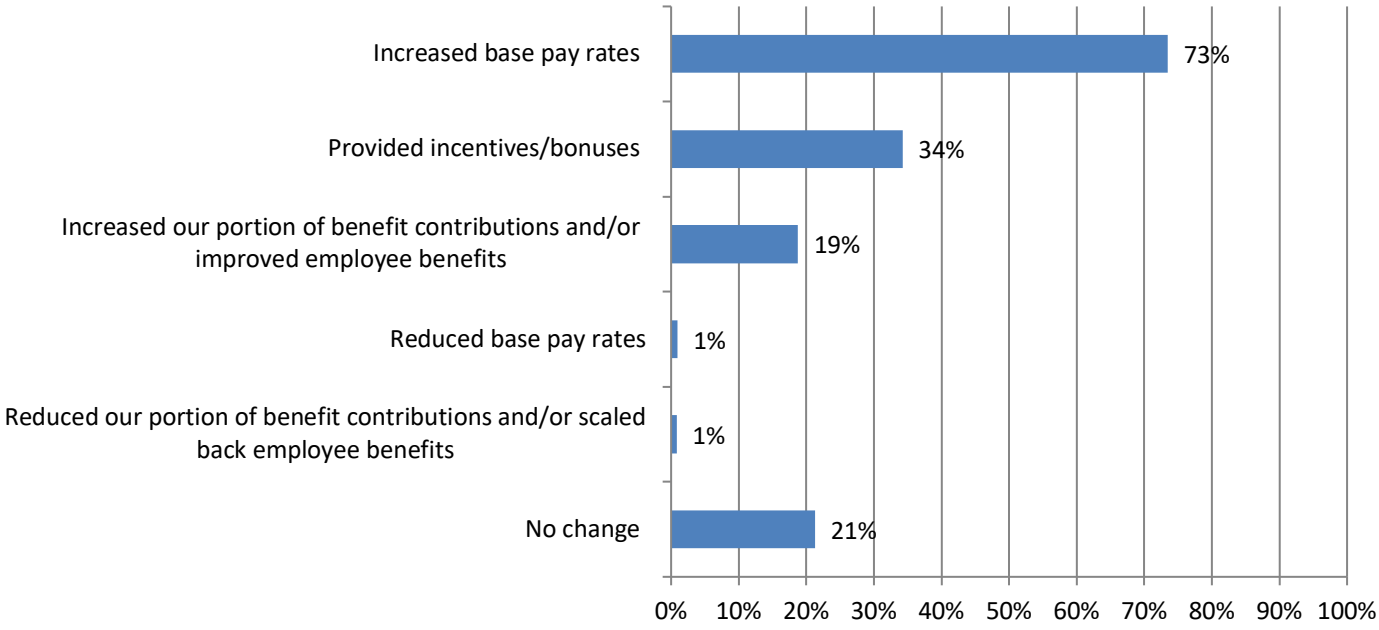
9. Has your firm added or increased use of the following to provide workers in the past 12 months? (Mark all that apply) Responses: 1,762



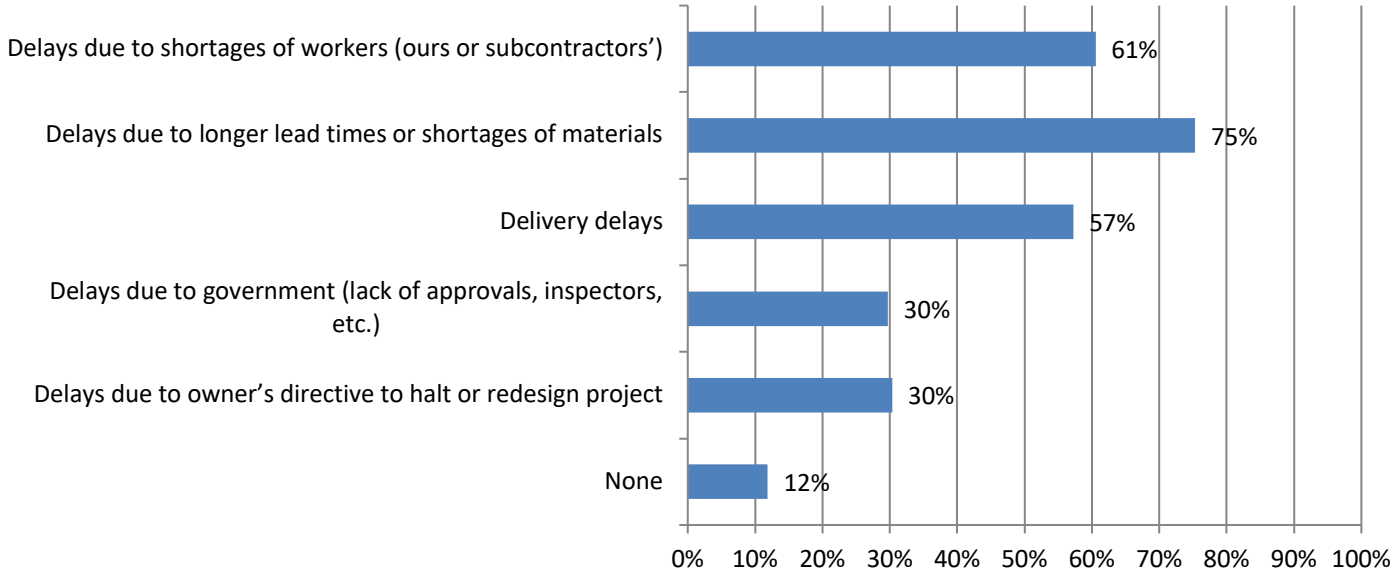
10. Has your firm made changes in hiring, training or scheduling in the past 12 months? (Mark all that apply) Responses: 1,759



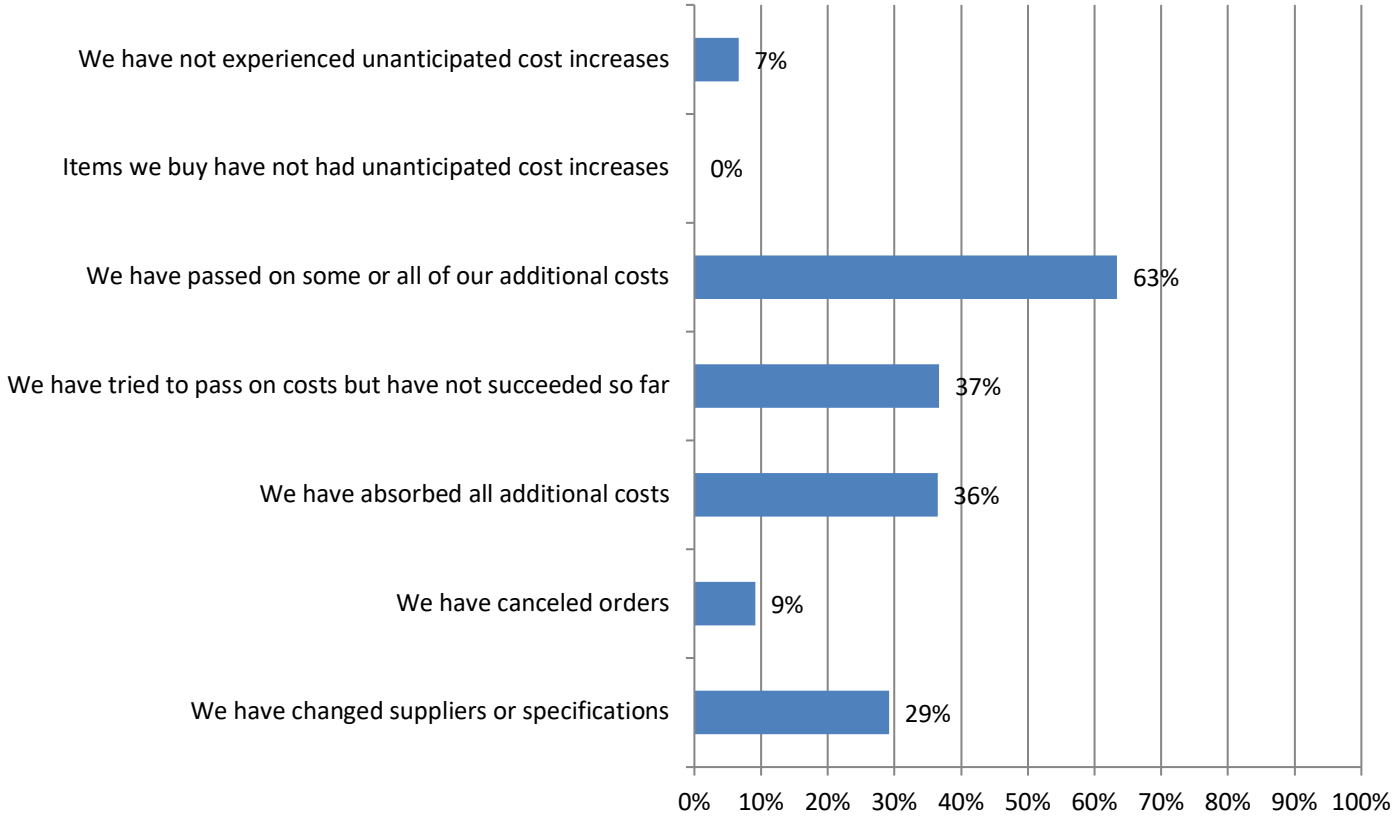
11. Has your firm adjusted pay and/or benefits for <u>hourly craft</u> or <u>salaried</u> personnel in the past 12 months? (Mark all that apply) Responses: 1,741



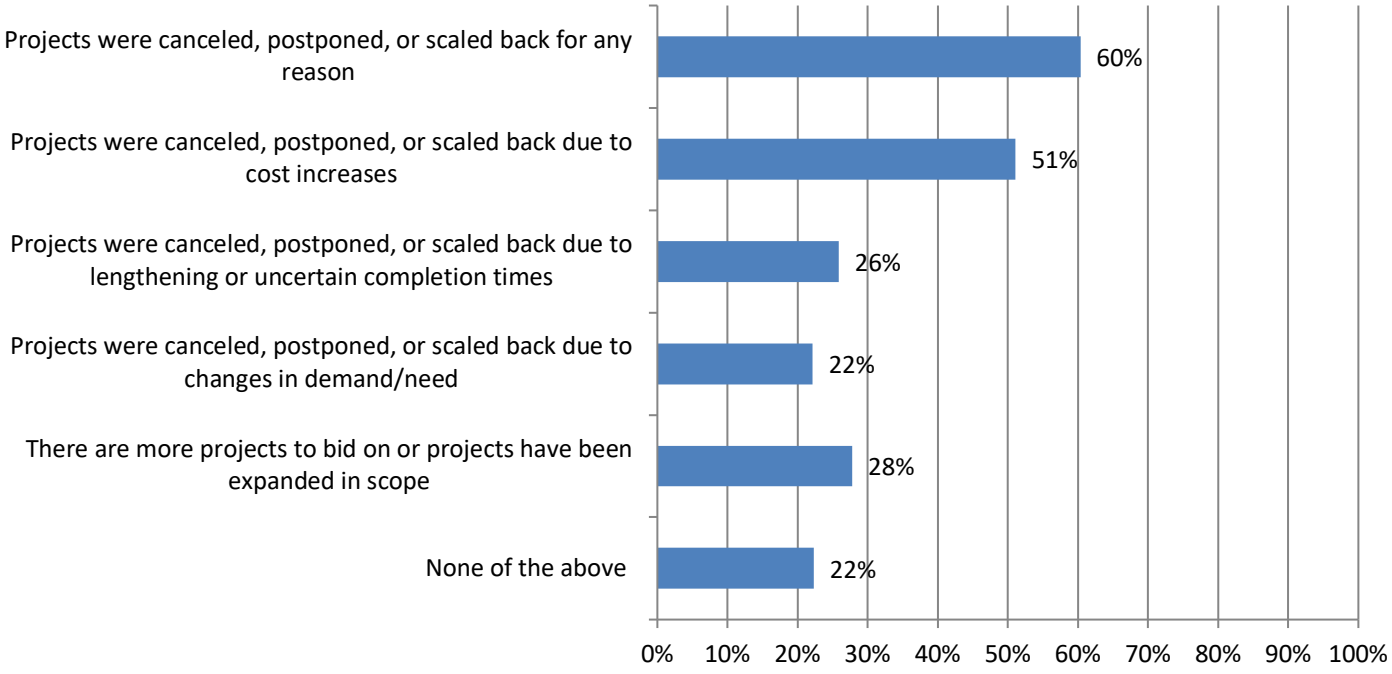
12. What impacts on project completion times, if any, is your firm experiencing? (Mark all that apply) Responses: 1,736



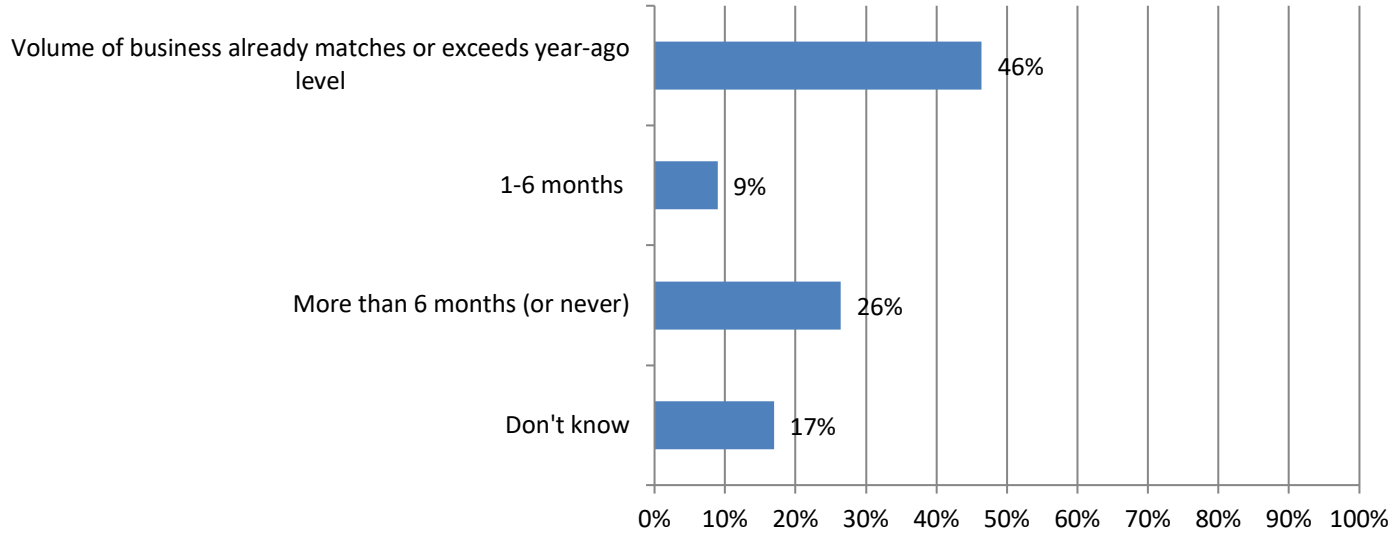
13. How have rising material costs affected your firm's projects, if at all? (Mark all that apply) Responses: 1,704



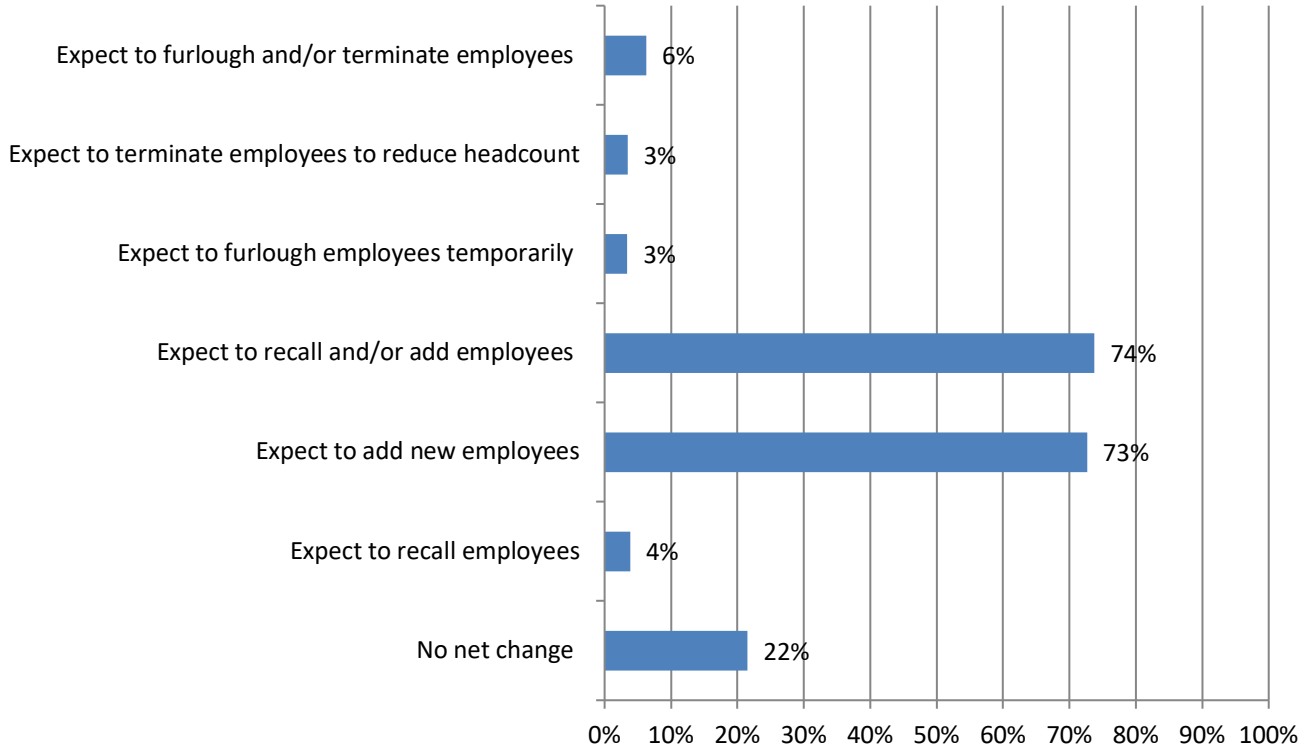
14. What impact, if any, are you experiencing with respect to upcoming or expected projects? (Mark all that apply) Responses: 1,665



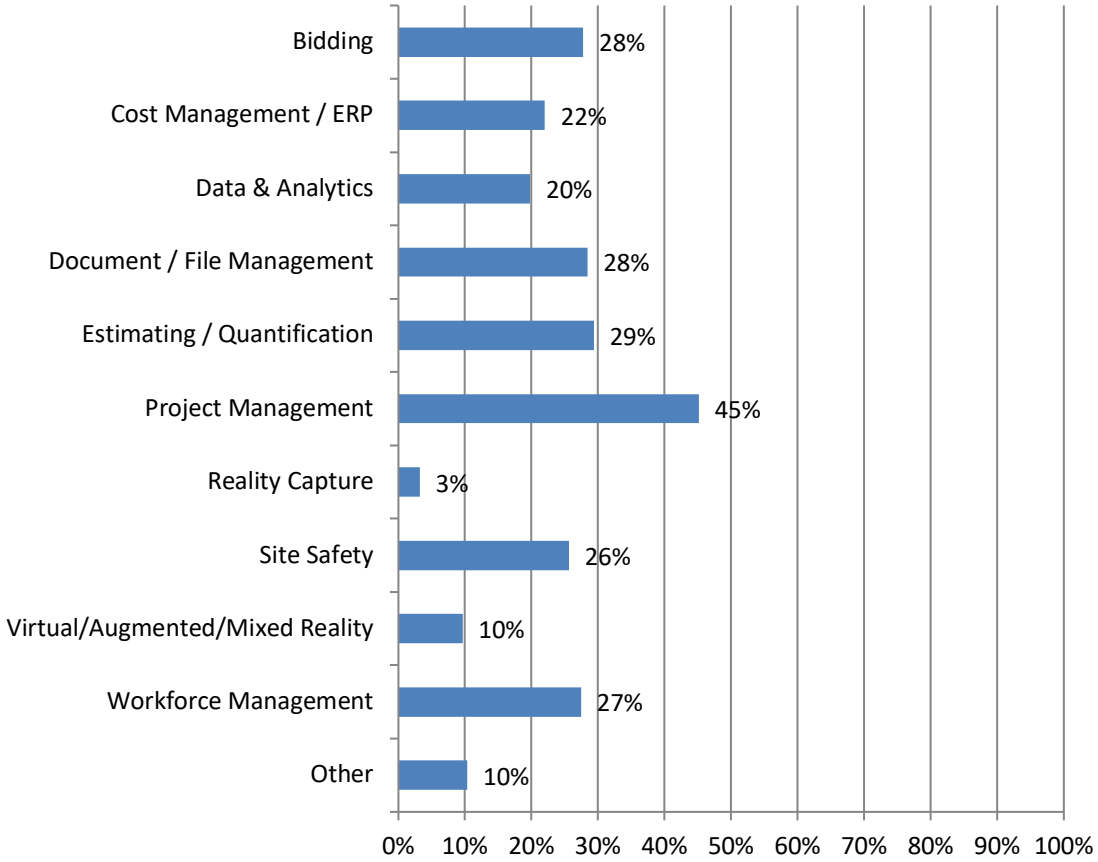
15. When do you expect your firm's volume of business will return to its normal level relative to one year earlier? Responses: 1,689



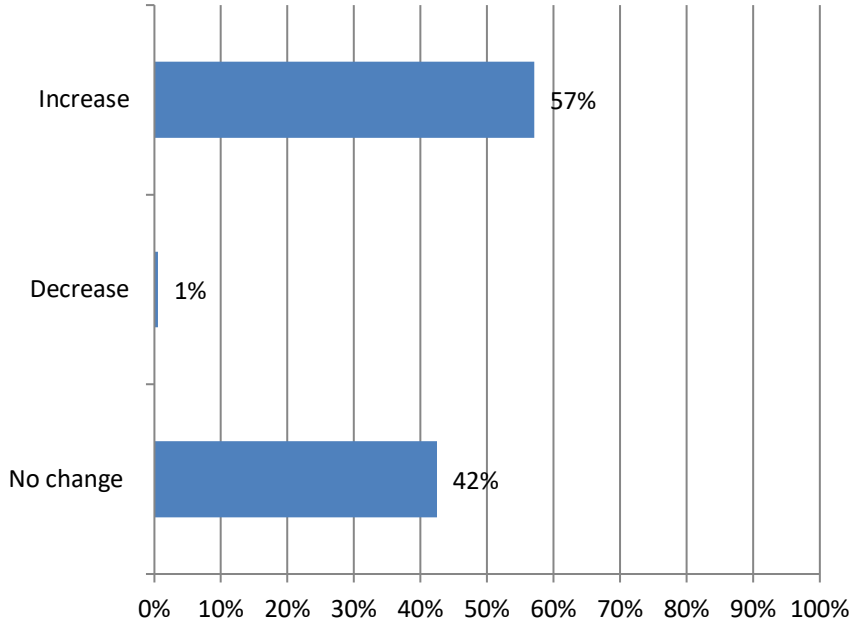
16. How do expect your firm's headcount to change in the next 12 months? (Mark all that apply). Responses: 1,691



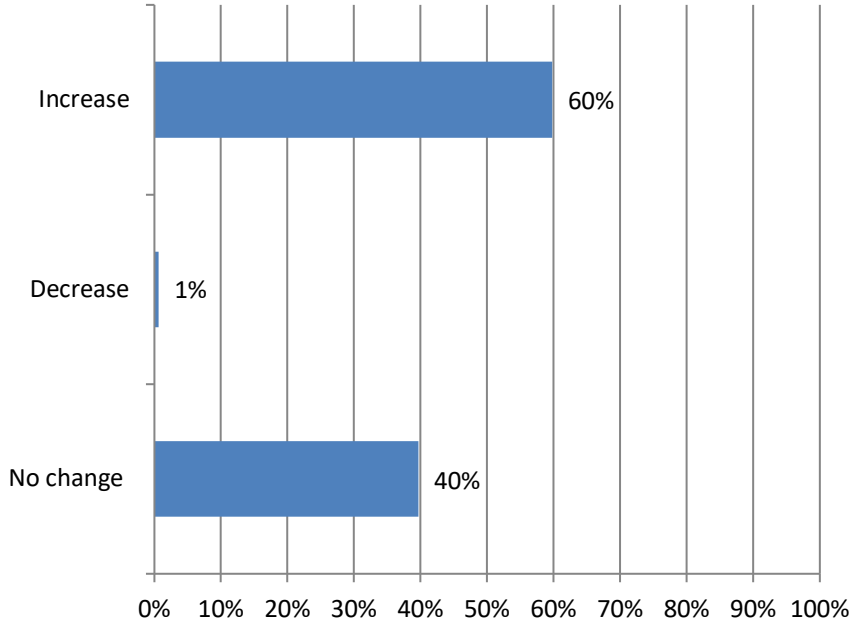
17. Which technologies (hardware or software) have you adopted over the last 12 months to help alleviate any labor shortages or enhance worker productivity at your firm? (Mark all that apply). Respondes: 1,141



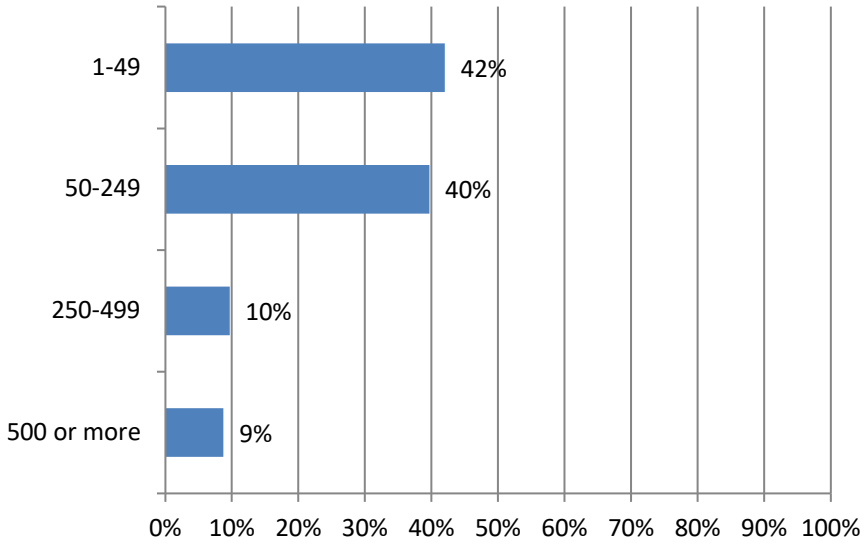
18. How has the rate of technology adoption changed at your firm in the last 12 months? Responses: 1,681



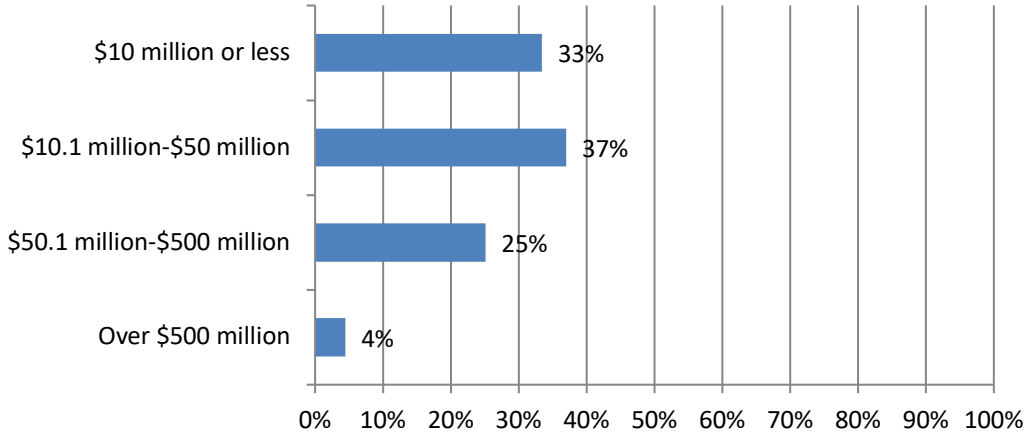
19. How do you anticipate the rate of tech adoption at your firm changing in the next 12 months? Responses: 1,685



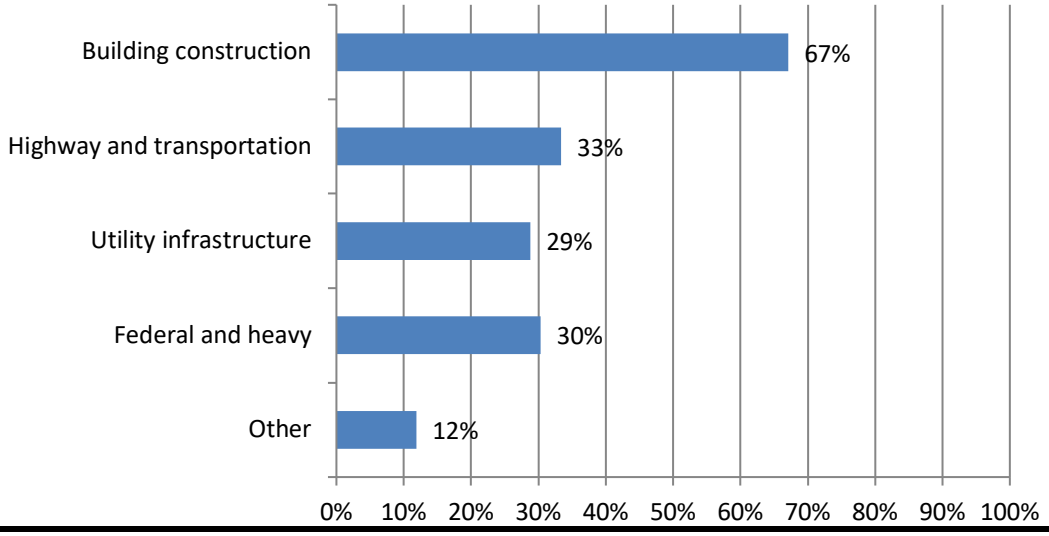
20. How many total employees did your firm employ at all of its locations as of June 30, 2021? Responses: 1,660



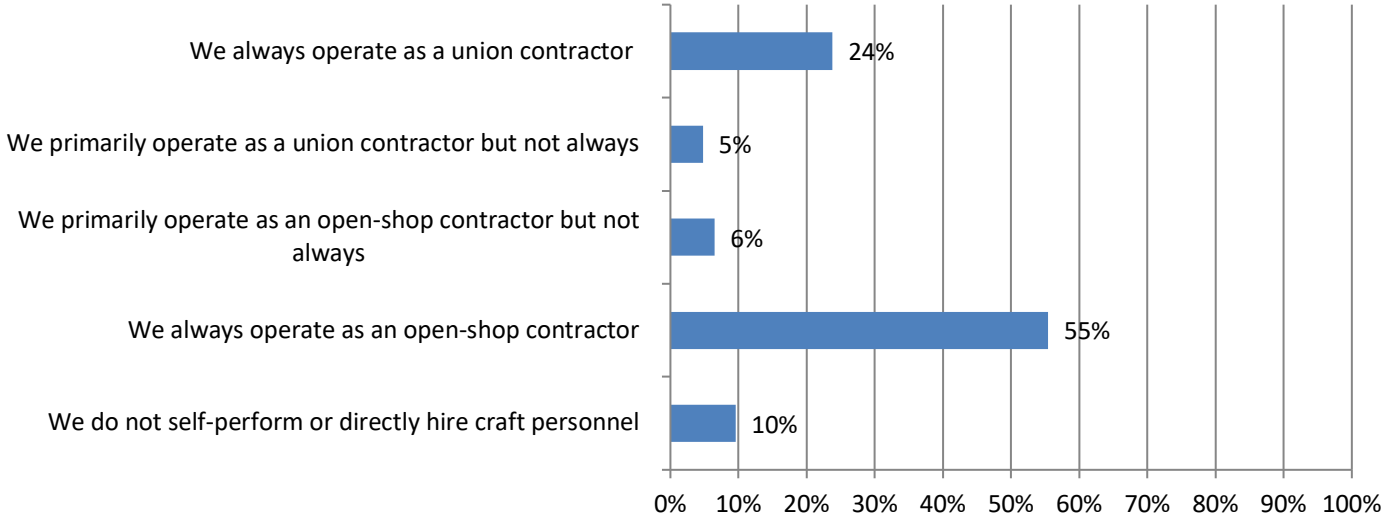
21. Estimate the total dollar amount of work your firm performed during the past 12 months. Responses: 1,660



22. Please indicate which of the following types of construction projects your firm performs (Mark all that apply) Responses: 1,660



23. **When you self-perform construction work, do you operate as a union contractor or an open-shop contractor?**
Responses: 1,620



Attachment 2

Expert Declaration - William J. McConnell, PE, JD, MSCE

DECLARATION OF WILLIAM J. McCONNELL PE, JD, MSCE

I, William J. McConnell, PE, JD, MSCE provide the following Declaration:

1. I am over the age of 18. I have personal knowledge of, and am competent to testify to, the matters contained in this declaration. The factual statements in this declaration are based on my personal and professional knowledge, and publicly available information. The opinions stated below are based on my knowledge, skill, training, and education in the construction industry. Various materials that I have relied upon in formulating my opinions are listed in the end notes.

2. I am the Chief Executive Officer of The Vertex Companies, Inc. ("Vertex"), an Architecture-Engineering-Construction firm with over 600 employees and offices across the United States, Canada, and Mexico. I have worked in the construction industry nearly my entire life. Upon graduating from the University of Maine in 1992 with a BS degree in Civil Engineering, I worked as a project engineer and assistant superintendent for Morganti Inc., which was an ENR Top 50 contractor at that time. Three years later, in 1995, I co-founded Vertex. For the past decade, Vertex has consistently been ranked as a top firm in multiple disciplines by ENR, and in 2021, ENR named Vertex a top Construction Management/PM-for-Fee (#38), Program Management (#49), Environmental (#160), and Design (#442) Firm in the US. While managing Vertex's practice for the past 27 years, I have overseen thousands of construction assignments, which include work on many mega-projects, which I define as projects that have construction costs that exceed $100 million. During my time with Vertex, I've obtained a certificate from a multi-year part time program at MIT, a JD from the University of Denver, a MS degree in Civil Engineering from Columbia University, and I am currently working on a doctoral degree related to construction economics from the University of Colorado. I am also a licensed general contractor in many jurisdictions and a licensed professional engineer in approximately half of the states in the US.

3. Since 2006, I have prepared an annual State of the Construction Industry analysis. I also research construction spending, employment, inflation, and other industry trends on a weekly basis. I have prepared reports and presented at industry events on delay and productivity claims, economic trends in construction, construction risk, and other relevant topics which I also research and present expert opinions on.

Background

4. In November of 2021, the Occupational Safety and Health Administration (OSHA) issued an emergency temporary standard (ETS) to establish binding requirements with the goal of protecting unvaccinated employees of large employers from the risk of contracting COVID-19 in the workplace.[i] OSHA notes that the ETS is also proposed as a "final standard" under Section 6(b) of the OSH Act.[ii]

5. The ETS only applies to employers with 100 or more employees. OSHA is confident that firms of this size "have the administrative capacity to implement the standard's requirements promptly, but is less confident that smaller employers can do so without undue disruption."[iii] OSHA's two stated goals of the ETS are to apply COVID-19 protection to two-thirds of all private sector workers and to provide protection for workers within the largest facilities in the US, where serious outbreaks could occur.[iv] According to OSHA, the overall number of covered employees under this ETS is 84,194,885 with two percent of them, or 1,921,591, associated with the construction industry.[v]

6. The ETS requires covered employers to take the following nine steps, with many of the steps requiring ongoing enforcement:

(1) Develop, implement, and enforce a mandatory COVID-19 vaccination policy or a COVID-19 policy that requires employees who are not fully vaccinated to undergo weekly COVID-19 testing and wear a face covering at the workplace.

(2) Determine the vaccination status of each employee, obtain acceptable proof of vaccination, maintain records of each employee's vaccination status, and maintain a roster of each employee's vaccination status.

(3) Provide employees reasonable time, including up to four hours of paid time, to receive each vaccination dose, and reasonable time and paid sick leave to recover from side effects experienced following each dose.

(4) Ensure that each employee who is not fully vaccinated is tested for COVID-19 at least weekly (if in the workplace at least once a week) or within 7 days before returning to work (if away from the workplace for a week or longer).

(5) Require employees to provide notice when they receive a positive COVID-19 test or are diagnosed with COVID-19. Immediately remove any employee from the workplace who received a positive COVID-19 test or is diagnosed with COVID-19. Keep removed employees out of the workplace until they meet criteria for returning to work.

(6) Ensure that each employee who is not fully vaccinated wears a face covering when indoors. Not prevent any employee, regardless of vaccination status, from voluntarily wearing a face covering unless it creates a serious workplace hazard.

(7) Provide employees with information about the requirements and implementation of the ETS and post the CDC document "Key Things to Know About COVID-19 Vaccines."

(8) Report work-related COVID-19 fatalities to OSHA within eight hours of learning about them, and work-related COVID-19 in-patient hospitalizations within 24 hours of the employer learning about the hospitalization.

(9) Make available for examination and copying an employee's COVID-19 vaccine documentation and any COVID-19 test results to that employee and to anyone having written authorized consent of that employee. Also make available upon request the

aggregate number of fully vaccinated employees at a workplace along with the total number of employees at that workplace.

7. AGC of America, ARTBA and SWACCA retained me to review the ETS and opine on the reasonableness and relevance of the ETS as it relates to the construction industry, and to identify any differences between the construction industry and the other industries covered under the ETS.

Summary of Opinions

8. Based on my evaluation of OSHA's ETS, I offer the following eight summary opinions that are further reviewed in the section below.

(1) Opinion 1. Most of those working in the construction industry spend significant amounts of their time working outdoors, but the number doing so "exclusively" is impossible to determine and requiring them to do so "exclusively" would have negative effects.

(2) Opinion 2. Even when working indoors, construction workers are rarely if ever packed as densely as workers in a meatpacking plant or even those working in office cubicles.

(3) Opinion 3. The construction industry has demonstrated an ability to implement jobsite-wide protocols and procedures that will be even more effective than the ETS in protecting construction workers from COVID-19.

(4) Opinion 4. No one working in the construction industry regularly interfaces with the public and few have occasion to interface with visitors.

(5) Opinion 5. Vaccine hesitancy will combine with a severe shortage of construction workers and strong demand for construction to preclude the ETS from having a significant impact on either the vaccination or the testing of the construction workforce

(6) Opinion 6. The already strained supply chain for COVID-19 testing kits will make it difficult if not impossible for many covered construction companies to give their employees the testing option.

(7) Opinion 7. OSHA's comparison of the airline industry to the construction industry is improper.

(8) Opinion 8. OSHA greatly underestimates the cost of compliance with the ETS.

Detailed Analysis

9. Every five years, the US Census Bureau publishes detailed information regarding the size of companies for each NAICS code. The NAICS code for construction is 23. Based on the most recent updates from 2007, 2012, and 2017 (Figure 1), approximately one percent of construction firms have 100 or more employees. As of 2017—the most recent update—only 7,722 of the overall 701,477 construction firms in the US employed more than 100 workers. These 7,722 firms employed 2,299,277 of the 6,533,061 construction workers in the US, or approximately one-third of the workforce.[vi] The following narratives provide a detailed analysis on how: (1) the ETS will be costly, prejudicial, and disruptive to these covered firms; (2) the ETS, if enforced, will have little impact on the vaccination status of construction workers; (3) the ETS is unnecessary due to the outdoor nature of much of construction and the protections that the construction industry has already put in place; and (4) the estimate of costs prepared by OSHA related to ETS compliance for the construction industry is low by a factor of at least five.

Overall Construction Industry	Year 2007	% of Whole	Year 2012	% of Whole	Year 2017	% of Whole	Avg. % [2007/2012/2017]
Construction Firms	799,811		640,951		701,477		
Number of Workers	7,267,883		5,260,942		6,533,061		
Firms with < 100 Employees							
Construction Firms	791,396	99%	635,234	99%	693,757	99%	99%
Number of Workers	4,936,657	68%	3,581,847	68%	4,233,784	65%	67%
Firms with 100+ Employees							
Construction Firms	4,208	1%	5,717	1%	7,722	1%	1%
Number of Workers	2,331,226	32%	1,679,095	32%	2,299,277	35%	33%

Figure 1: Construction Industry Data Compiled by the US Census Bureau for 2007, 2012, and 2017.[vii]

Opinion 1. Most of those working in the construction industry spend significant amounts of their time working outdoors, but the number doing so "exclusively" is impossible to determine and requiring them to do so "exclusively" would have negative effects.

10. OSHA recognizes that "[e]mployees who work exclusively outside face a much lower risk of exposure to SARS-CoV-2 at work."[viii] The ETS provides an exemption for this class of employee.[ix] OSHA further understands that there is a low likelihood of transmission in the construction industry due to the outdoor nature of the work: "[t]herefore, these studies provide some evidence for the low likelihood of outdoor transmission in other workplace activities greatly impacted by the pandemic, **such as in construction** (emphasis added)."[x] This distinction is important, as the nature of construction work is unlike other indoor-focused industries subject to the ETS such as manufacturing, retail, meatpacking, and healthcare. Moreover, these non-construction industries often operate out of large indoor facilities where large outbreaks can occur, which the ETS is designed to prevent.[xi]

11. Almost half of the construction workforce that are employed by firms with a staff size of 100 or more work outside.[xii] Nearly all heavy and civil construction work is performed outdoors, as is a large portion of building construction work. On building projects, the earthwork, utilities, foundation, site concrete, building structure, building veneer, roofing, paving, landscaping, and other specialty divisions

of work are performed outdoors. Despite this recognition, OSHA posits that while most employees work "constantly" outdoors, based on a US Bureau of Labor Statistics (BLS) survey of occupations, only ten percent of this labor pool works "exclusively" outdoors. OSHA does not provide any basis for how it arrived at this ten percent figure. As shown below, many of the occupations that BLS noted work "constantly" outdoors are construction trades.

Table IV.B.1-Occupations with workers who work outdoors

SOC Code	Occupation	Percent outdoors constantly	Percent outdoors exclusively
373011	Landscaping and Groundskeeping Workers	90%	9%
472061	Construction Laborers	79%	8%
474051	Highway Maintenance Workers	48%	5%
339092	Lifeguards, Ski Patrol, and Other Recreational Protective Service	45%	5%
470000	Construction and Extraction Occupations	42%	4%
471011	First-Line Supervisors of Construction Trades and Extraction	39%	4%
472073	Operating Engineers and Other Construction Equipment Operators	36%	4%
370000	Building and Grounds Cleaning and Maintenance Occupations	26%	3%
272022	Coaches and Scouts	14%	1%
530000	Transportation and Material Moving Occupations	8%	1%
390000	Personal Care and Service Occupations	5%	0.5%
270000	Arts, Design, Entertainment, Sports, and Media Occupations	2%	0.2%

Source: BLS Occupational Requirement Survey (BLS, 2020), OSHA calculations.

Figure 2: Table IV.B.1 – Occupations with Workers Who Work Outdoors.
[Highlights Show Construction Trades][xiii]

12. OSHA concedes, however, that "OSHA's estimate of employees who work exclusively outdoors does not account for employers who only need to make slight adjustments to their current work practices to ensure that their employees qualify for the outdoor exemption, such as by holding tool box talks outdoors instead of in a traditional indoor location."[xiv] OSHA's position regarding the exemption is too simplistic here and doesn't consider the practical problems with this exemption, failing to consider the blurred lines associated with outdoor and indoor construction.

13. For starters, the particulars of this exemption create practical problems. Construction jobsites are not fixed locations. They come and they go, as current projects reach completion and new projects come along. It follows that field workers are constantly changing their often-lengthy commutes.

One month, they are 45 minutes from home. The next month, they are more than two hours away. And to control the vagaries and costs of commuting, construction workers often share vehicles. There are also many types of construction projects which have predominately outdoor work, which are performed by "remote" teams that are lodged in temporary housing or hotels. These crews often share company vehicles to the project site. To take advantage of the exemption, construction firms would have to prohibit that practice and compel each worker to pay for individual transportation, or as a company pay the additional costs to allow for each worker to have their own vehicle.

14. Other practical problems are even more severe. The construction industry's field workers must endure hot and cold working conditions, as weather changes from season to season. For them to qualify for the exemption, construction firms would have to deny them the option of gathering indoors during their lunch or other breaks either to cool down or warm up. Whatever the weather, they would have to remain outdoors for all but brief moments. Hence, slight adjustments that move workers from constantly outdoors to exclusively outdoors might result in unintended negative consequences.

15. Next, as a threshold matter, the line between indoor and outdoor construction activity is a blurred one. The line that OSHA draws between indoor and "exclusively" outdoor work is far too simplistic to account for the construction of office buildings, apartments, hotels, hospitals, and the like. During building shell construction, floors and ceilings may be there, but walls or windows may not. Some walls and windows may also be there, but others are not, and at least until the structure is fully enclosed, the ventilation will continue to exceed anything one would expect to find in a typical office building or factory. Thus, a majority of overall construction work takes place in an open-air setting. Much of the work on buildings is neither indoors nor outdoors in any obvious way. The agency's black-and-white line simply does not exist in the world of building construction. It does not portray a serious and credible effort to tailor the ETS to fit the unique characteristics of an industry that OSHA has always understood to be different from all others.

16. In sum, OSHA's "exclusively" outdoor exemption will be impossible to apply to much of the work that construction companies perform in any consistent way.

Opinion 2. Even when working indoors, construction workers are rarely if ever packed as densely as workers in a meatpacking plant or even those working in office cubicles.

17. Construction contractors seek to avoid the scheduling of work that causes overmanning, crowding, and stacking of trades, as these circumstances often lead to a reduction in planned productivity. When crowding does occur, it often leads to disputes among the parties. Accordingly, contractors work hard to sequence construction work to properly space skilled workers to maximize efficiency and promote safety. Thus, the construction industry operates in a naturally spaced environment, which further contrasts the construction industry from other industries subject to the ETS.

Opinion 3. The construction industry has demonstrated an ability to implement jobsite-wide protocols and procedures that will be even more effective than the ETS in protecting construction workers from COVID-19.

18. Construction is a safety-first industry that takes personal protective equipment seriously. According to a recent article by McKinsey & Company, construction and manufacturing are the two largest end users of PPE. Combined, these industries use 55% of all PPE.[xv] Most construction sites require workers to wear PPE items such as hardhats, safety vests, safety goggles, masks, gloves, long pants, shirts, and steel-toed shoes. Hence, the industry is accustomed to wearing face masks and other PPE for indoor work and is otherwise effective in implementing safety protocols and procedures.

19. During 2020, construction was deemed an essential service throughout nearly every state.[xvi] One such state which deemed construction essential, New York, noted that prior to development

of a vaccine and despite construction being an ongoing and essential service, construction represented only a small percentage of COVID-19 exposure (Figure 3). Construction's strong safety protocols were a major factor in protecting construction workers from COVID-19.

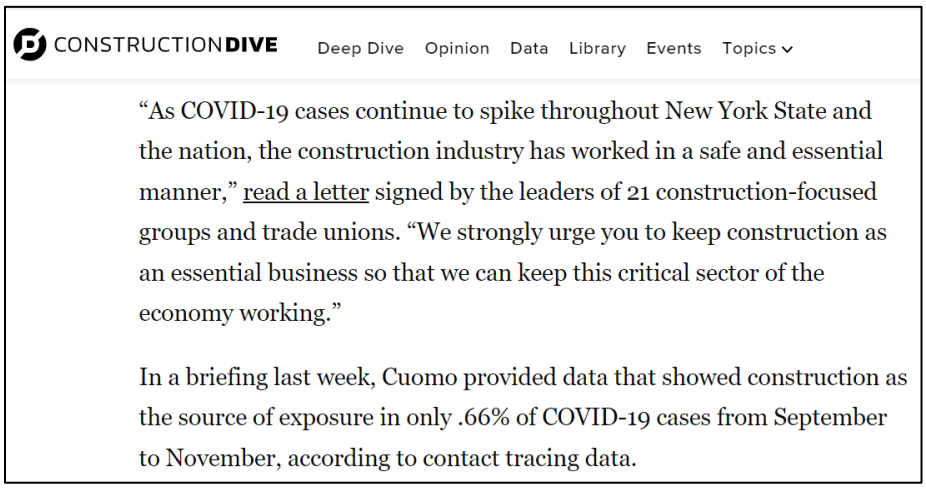


Figure 3: Construction Dive Article dated December 18, 2020 regarding limited COVID-19 exposure from construction sites.[xvii]

20. The construction industry quickly responded to safety concerns of COVID-19 by implementing protocols, procedures, and new technologies to mitigate risk. For example, AGC of America and ARTBA, along with their chapters, coalition partners, and members developed numerous resources which were propagated to the industry at large, including sample plans for exposure presentation, preparedness and response, tips for keeping workers safe, and best practices for construction jobsites.[xviii, xix] The swift response contributed to the success of the construction industry, even in the absence of vaccinations.

21. Construction jobsites are fundamentally different from single employer sites that characterize most industries. Generally, each trade on a construction jobsite is a separate company, leading to jobsites being multi-employer sites. Another arbitrary feature of the ETS, once enforced, will be that firms subject to the ETS will be working side by side with smaller firms that are not subject to the ETS. On a typical building project, there are often ten to twenty different contractors that work on the project. Accordingly, an average jobsite will include a small number of workers from firms that are subject

to the ETS that will be comingled with a much larger number of workers from firms that are not subject to the ETS. The fact that virtually every construction jobsite will include a comingling of covered and uncovered firms defeats the purpose of the ETS.

Opinion 4. No one working in the construction industry regularly interfaces with the public and few have occasion to interface with visitors.

22. Another feature of construction that naturally protects construction workers from the risk of exposure to COVID-19 is that construction work is not public-facing; it is separated from the public. Unlike other subject industries such as healthcare and retail, construction workers rarely interact with the public. In instances when they do, it is almost exclusively outdoors—i.e., traffic flagging, signaling, etc. For a host of safety and other reasons, construction sites are typically secured with fencing that creates a barrier between the construction workers and the general population. OSHA already considers construction workers who have minimal occupational contact with the public or other coworkers to have a low exposure risk. There are limited instances where people working in the construction industry do need to interact with visitors, such as with inspectors, owner's representatives, and others. However, these interactions typically only occur between a small number of people and can be held with social distancing and other safety measures.

Opinion 5. Vaccine hesitancy will combine with a severe shortage of construction workers and strong demand for construction to preclude the ETS from having a significant impact on either the vaccination or the testing of the construction workforce, and the ETS will only serve to penalize the small percentage of firms covered by the ETS.

23. If enacted, the overall impact that the ETS will have on the construction industry will likely be de minimis because the large pool of vaccine-hesitant workers will be able to easily shift employment to firms not subject to the ETS due to the wealth of job openings created by the booming construction market and shrinking labor pool. This will disrupt the operations of the subject employers via turnover issues and increased costs, and as a result these employers might have difficulty in meeting current and future contract obligations.

Opinion 5-A. OSHA is aware that the ETS will not have a significant impact on the vaccination status of vaccine-hesitant workers, and the construction industry is more hesitant than other industries.

24. OSHA understands and the ETS contemplates that vaccine-hesitant workers will likely not get vaccinated under any circumstance. OSHA estimates that as of the date of its preamble (November 5, 2021), 62.4 percent of covered employees were vaccinated, meaning that 37.6 percent are unvaccinated.[xx] Based on CDC data, OSHA estimates that 13.8 percent of the covered workers are vaccine-hesitant (Figure 4), which amounts to 36.7 percent of unvaccinated workers (13.8 / 37.6 = 36.7 percent). Data suggests that vaccine-hesitancy for the construction industry is much higher when compared to other industries, so the ETS will have little impact on the construction industry.[xxi]

> Based on vaccine confidence data from CDC (CDC, October 2021a), 13.8 percent of the population "probably or definitely will not" get the vaccine; hereafter referred to as "vaccine-hesitant". Since this group is by definition part of the currently unvaccinated, OSHA characterizes the currently unvaccinated (37.6 percent) as being comprised of those who are vaccine--hesitant (13.8 percent) and the remainder, who while unvaccinated, are not hesitant because they are not in the "probably or definitely will not" group (23.8 percent).

Figure 4: Excerpt from the ETS Preamble.[xxii]

25. The construction safety and health research organization CPWR maintains a COVID-19 Vaccination Dashboard, which displays data from a daily survey of Facebook users conducted by the

Delphi Group at Carnegie Mellon University.[xxiii] Overall, the CPWR data shows craftworkers and other construction professionals in general have a much higher vaccine hesitancy rate compared to other occupations (Figure 5). The dashboard shows a 37.0 to 44.9 percent vaccine hesitancy for construction workers for the period of November 7, 2021 to December 26, 2021, compared to vaccine hesitancy of 13.6 to 16.9 percent of respondents in other occupations over this same period. Note the vaccine hesitancy of 13.6 to 16.9 percent for non-construction occupations falls in line with OSHA's 13.8 percent projection. Because the CPWR data shows that vaccine hesitancy in construction is approximately three times that of other industries, the ETS will have little effect in increasing the vaccinated population in the construction industry.

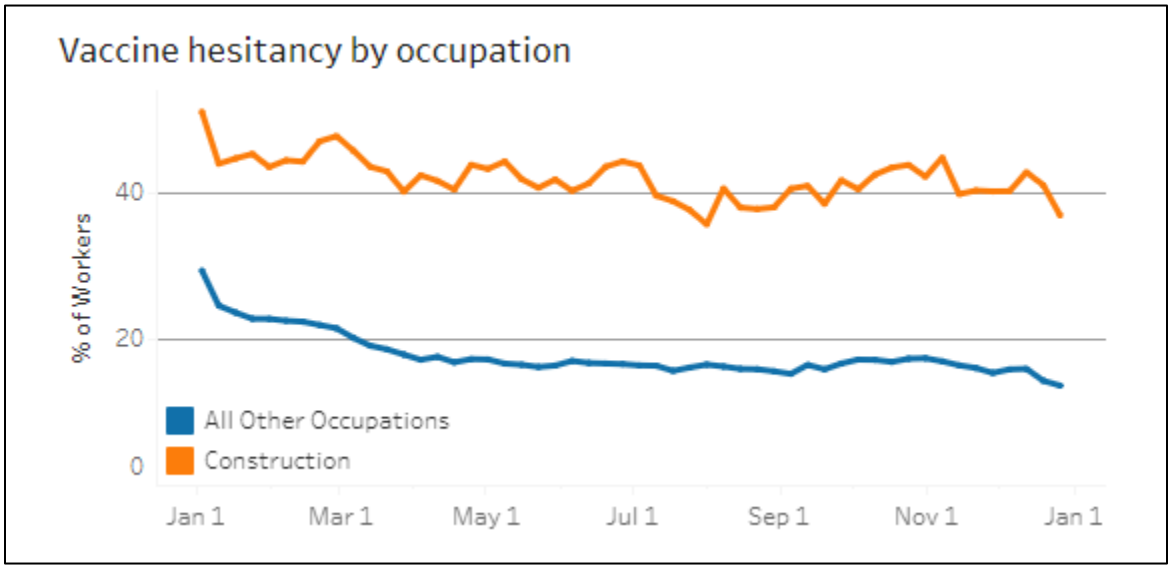


Figure 5. Vaccine Hesitancy by Occupation.[xxiv]

26. Other studies further support this data wherein it is observed that 50 percent of construction workers will refuse the vaccine and that construction workers are the most hesitant group compared to other professions.[xxv] In an article from Construction Dive, a survey shows that 75 percent of unvaccinated workers say a mandate might make them quit.[xxvi] This furthers the position that the ETS will have little impact on vaccination status in the construction industry.

Opinion 5-B. If the ETS is enforced, unvaccinated construction workers will easily shift to the 99 percent of construction firms that are not bound to the ETS due to the booming construction marketplace and current labor shortage.

27. The construction industry is a fragmented marketplace. Of the roughly 700,000 construction firms, almost 99 percent have less than 100 employees, and 90 percent have less than 20 employees. [xxvii] Therefore, most construction companies will not be bound by the ETS. Companies with less than 100 employees account for 99 percent of construction industry. As a result of the limited labor resources and ample construction work that exists today, construction professionals and craftworkers can be selective in the work they wish to pursue and have even more freedom with the projects they wish to work on. If a construction craft worker or construction manager with vaccination hesitancy does not wish to be vaccinated to work for a covered contractor, he or she can "walk across the street" to find employment at a smaller firm which would not be covered by the ETS.

28. Labor shortage has been ***the*** issue that has plagued the construction industry since 2016, when the unemployment rate of construction workers dipped below five percent.[xxviii] While the unemployment rate spiked in April of 2020 due to the pandemic, the rate plummeted thereafter, and in August of 2021 it dropped below pre-pandemic levels, so this issue of labor shortage persists to date.[xxix] Several reasons account for this issue. For starters, private construction, which makes up nearly 80 percent of construction spending, has surged over the past decade.[xxx] Also, Baby Boomers, which make up approximately 40 percent of the construction industry, are retiring at record levels (the "Great Retirement") and will continue to retire throughout this decade and new workers are not filling this gap.[xxxi,xxxii]

29. BLS data shows that the current employed construction workforce is made up of approximately 7.5 million people, which is less than it was in 2007.[xxxiii] The labor pool has not grown from its pre-Great Recession level even through construction spending has risen from approximately $1.2

trillion in 2006/2007 to approximately $1.6 trillion in 2021.[xxxiv] As a result of this stagnation, employees are working more hours to meet increasing project demands. In September of 2021, BLS data noted that the average construction industry employee put in an average of 40.1 hours per week, which is the highest recorded monthly average since BLS has maintained such data (2006), and this trend has continued into December of 2021.[xxxv] Hence, the construction industry is currently experiencing one of the tightest labor markets over the past several decades.

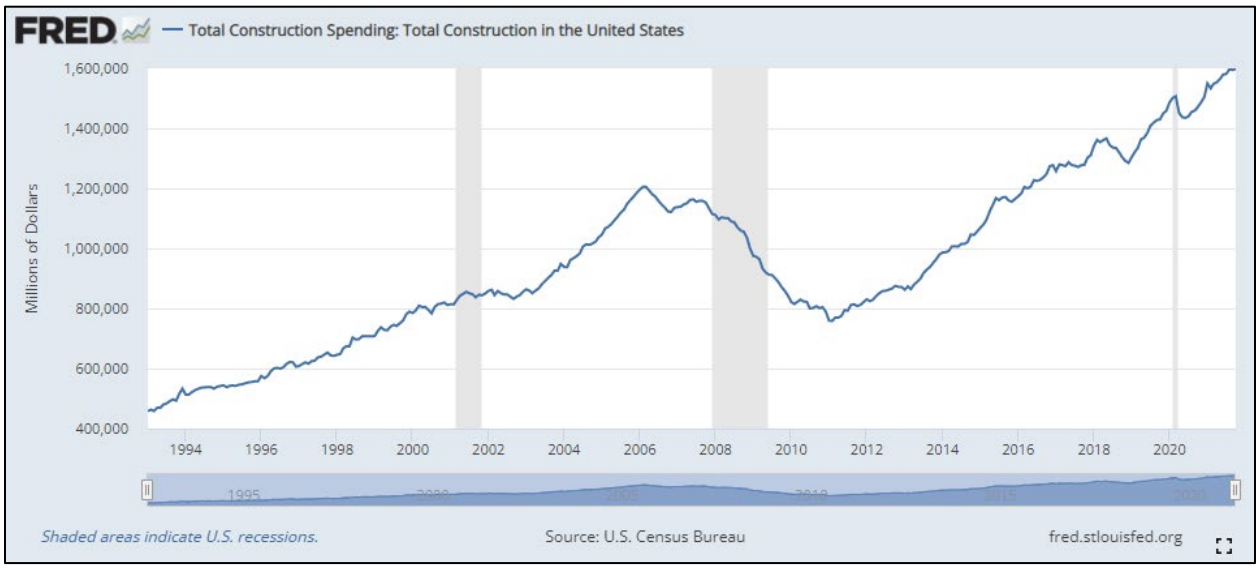


Figure 6. Total Construction Spending in the United States (Source: US Census Bureau).[xxxvi]

30. Other sources have also highlighted the strain in construction employment. The US Chamber of Commerce has been publishing the Commercial Construction Index since 2017. The data related to contractors having difficulty finding skilled workers shows the following: from 2017 to the beginning of 2020, at least 88 percent of contractors reported either moderate or high difficulty finding skilled workers.[xxxvii] This has led to 35 percent of contractors having to turn down work because of their lack of skilled workers.[xxxviii] Despite a small decrease during 2020 to 83 percent of responding contractors experiencing moderate to high difficulty finding skill workers, the numbers in 2021 are rising back up to the pre-COVID-19 levels.[xxxix] The data for concerns over workers having adequate skills shows that

between 83 and 94 percent of contractors have had medium to high concerns, with the most recent quarter at its highest level since the 2nd Quarter of 2017.[xl]

31. In addition to labor shortage, the construction industry is facing an employee turnover issue, and the ETS will exacerbate this issue. As seen in Figure 7, the number of construction-quits in the US is at its highest level in over a decade. In fact, over the past twelve months, the number of construction-quits has risen from approximately 90 thousand to over 200 thousand.

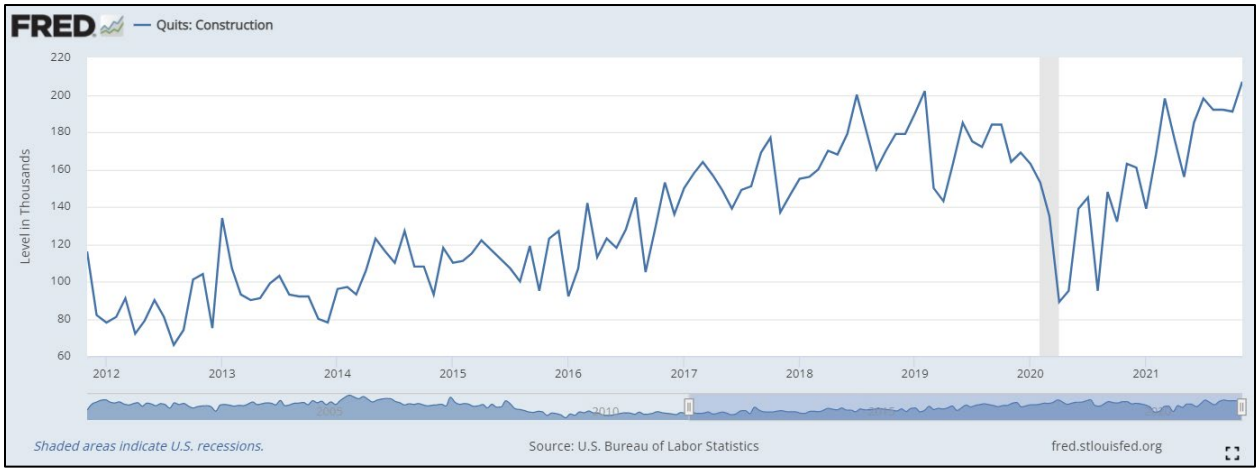


Figure 7: FRED Data on Construction Quits.[xli]

32. In sum, the construction industry is facing worker shortage and turnover issues, which will allow unvaccinated workers to easily transition to the 99 percent of construction firms that are not bound to ETS compliance. This, along with the elevated level of vaccine hesitancy, will result in an ETS that has little impact on the vaccination status of the construction industry.

Opinion 5-C. The ETS will disrupt the construction firms that are covered by it due to increased administration costs and anticipated workforce turnover.

33. Construction companies that are subject to the ETS will be disrupted by the loss of their unvaccinated workforce and the costs associated with the ETS. As shown above in Figure 5, recent data notes that 37.0 to 44.9 percent of construction workers are vaccine hesitant and this worker pool will

likely transition to firms that are not bound to ETS requirements. Turnover of this magnitude would be crippling for covered firms in any work environment, but particularly during the labor shortage crisis which the construction industry is experiencing. In fact, I am not aware of any construction establishment in the US that has implemented an internal vaccine mandate. To the contrary, contractors are voicing concerns about workforce attrition if the ETS is placed into effect.

> Construction businesses have already voiced concerns about workers jumping to smaller companies in the face of a federal vaccine mandate for workers at companies with more than 100 employees. At Rochester, Minnesota-based commercial contractor Benike Construction, which has more than 100 employees, cousins Aaron and Mike Benike have had to let some veteran workers with hard-to-find skills in today's labor market leave, because they refused to get the shot.

Figure 8: Construction Dive Article Published December 14, 2021.[xlii]

34. Firms that lose a large percentage of their workforce will find it difficult to adhere to current contract obligations that bind the firms to tight schedules—particularly for specialty contractors such as mechanical, electrical, and plumbing contractors that have large labor demands. These firms will find it difficult and timely to replace the departed workers.

35. In addition, construction firms that are subject to the ETS requirements will be at a competitive disadvantage to firms that fall just below the 100-employee mark. This will disrupt the competitive landscape of the construction marketplace. ETS compliance will be costly, and it is unlikely that contractors will be able to pass along such costs to customers. Common contract forms between general contractors and owners preclude the inclusion of home office overhead. For specialty contractors, which make up approximately 70 percent of the firms with greater than 100 employees, passing along costs to general contractors will be difficult as well.[xliii] General contractors typically have many options when it comes to specialty trades, such as mechanical or electrical work; hence, in most cases,

subcontractors will not be able to pass along the added costs to the general contractors that will be inclined to retain specialty firms not subject to the ETS at a lower cost.

36. While the intent of the ETS is to get workers vaccinated by pressuring employers, it will lead to costly worker turnover and increased administrative costs for the employer. In addition, the ETS will further the labor shortages crisis for the covered companies, and these effects will be disruptive, as the covered firms will have a difficult time meeting current contract obligations.

Opinion 6. The already strained supply chain for COVID-19 testing kits will make it difficult if not impossible for many covered construction companies to give their employees the testing option.

37. According to a December 23, 2021 article by CNN, it is a struggle to find COVID-19 testing kits.[xliv] CNBC reported on January 5, 2022 that a "tsunami of demand" exists as "businesses prepare for the Biden's administration vaccine and testing mandates."[xlv] Based on my calculations, and assuming there is no turnover of the unvaccinated employees that work for firms with 100-plus employees and that none of these employees get vaccinated, the construction industry will need 864,528 test kits per week to adhere to the ETS requirements. This equates to over 44 million tests per year. If you consider all workers covered by the ETS that operate in various industries, the total number of required test kits per year will be greater than 1.6 billion, which is approximately five times the total number of COVID-19 tests that have been administered to date according to The Covid Tracking Project.[xlvi] It is unreasonable to assume that the firms or employees covered under the ETS will have the ability to secure the necessary number of COVID-19 tests to avoid rigid mandates for vaccinations.

OSHA's Estimate of Covered Employees	84,194,885
OSHA's Estimate of Unvaccinated Employees	32,583,420
Potential Number of Required COVID-19 Test Kits per Week	32,583,420
Potential Number of Required COVID-19 Test Kits per Year	1,694,337,866
Total Number of Covid Tests per "covidtracker.com" To Date	363,825,123

Figure 9: Calculation of the potential number of COVID-19 tests that the ETS will require each year.

Opinion 7. OSHA's comparison of the airline industry to the construction industry is improper.

38. OSHA argues that the net effect of the ETS on employee turnover will be "relatively small, given the option for employers to implement a testing and face covering policy and the countervailing forces surrounding turnover that will limit those effects."[xlvii] OSHA attempts to support this position by citing that United Airlines only had 593 employees out of the company's 67,000 US employees that did not comply with the company's vaccination mandate as of the end of September of 2021.[xlviii] This comparison is flawed. The commercial airline industry is an oligopoly while construction is a highly fragmented market.

39. According to the Bureau of Transportation Statistics, which operates within the US Department of Transportation, the top four airlines, including United Airlines, make up 65 percent of the overall commercial airline industry while the top ten commercial airlines have nearly a 90 percent market share.[xlix] The airline industry is at the opposite end of the spectrum when compared to the construction industry, where the top four hundred contractors make up less than 25 percent of the overall construction marketplace.[l] Moreover, job opportunities for construction workers are far broader than opportunities for commercial airline workers because of the industry concentration differences and that the airline industry was hit hard by the pandemic, which limited opportunities, and that was not the case in the growing construction industry.

Opinion 8. OSHA greatly underestimates the cost of compliance with the ETS.

40. OSHA estimates that the overall costs of the ETS to covered construction firms will be $78,096,207, or an average of $10,113 per covered construction firm (Figure 10).[li] OSHA significantly underestimates the costs that covered construction firms will incur to comply with the ETS.

Table IV.B.13. Total Costs

NAICS 3	NAICS Description	Cost per Entity	Total Cost
	All	**$11,298**	**$2,981,347,368**
111	Crop Production	$5,442	$129,049,269
112	Animal Production and Aquaculture	$5,442	$143,466,214
113	Forestry and Logging	$3,520	$186,556
114	Fishing, Hunting and Trapping	$3,909	$31,272
115	Support Activities for Agriculture and Forestry	$4,482	$1,147,268
211	Oil and Gas Extraction	$13,058	$3,382,027
213	Support Activities for Mining	$13,032	$7,141,522
221	Utilities	$29,281	$24,649,875
236	Construction of Buildings	$8,559	$13,368,408
237	Heavy and Civil Engineering Construction	$12,466	$21,104,850
238	Specialty Trade Contractors	$7,982	$43,622,949

Figure 10: Total Cost for Implementing the ETS Divided up by Trade.
Trades in the Construction Industry are Highlighted.[lii]

41. To properly comply with this policy, covered firms will need to hire *at least* one full time HR administrator to manage this process. The ETS requires employers to "establish new systems to track vaccination status among workers, to keep related records, and for firms that allow the testing option, to keep records of each test." [liii] OSHA goes on the note that "[t]hese records must be treated as confidential medical records subject to detailed regulations…[per] 29 CFR 1910.1020." [liv] Because the ETS relates to medical issues and other privacy issues, this process should be managed by human resource specialists. Per the BLS, the average Human Resource Specialist currently earns $30.52 per hour, or $61,040 per year when considering a 2,000-hour work-year (Figure 11). Once fringe benefits are added to this amount, which I calculate to be 33 percent of wages based upon experience (BLS calculates fringes to be 31 percent[lv]), it increases the annual cost to $81,183.20.

Table 1. National employment and wage data from the Occupational Employment and Wage Statistics survey by occupation, May 2020

Occupation	Employment	Mean wages		Median hourly wages
		Hourly	Annual[1]	
All occupations	**139,099,570**	**$27.07**	**$56,310**	**$20.17**
Business and financial operations occupations	**8,387,490**	**38.79**	**80,680**	**34.73**
Business operations specialists	5,632,020	37.66	78,320	34.35
Agents and business managers of artists, performers, and athletes	16,240	47.15	98,070	36.26
Buyers and purchasing agents	419,920	34.80	72,370	32.06
Claims adjusters, appraisers, examiners, and investigators	300,380	33.92	70,560	32.76
Claims adjusters, examiners, and investigators	287,150	33.97	70,650	32.82
Insurance appraisers, auto damage	13,220	32.95	68,540	31.52
Compliance officers	327,360	36.35	75,620	34.18
Cost estimators	199,360	35.08	72,960	32.03
Human resources workers	718,120	33.63	69,950	30.81
Human resources specialists	647,810	33.38	69,430	30.52
Farm labor contractors	(4)	24.18	50,300	22.97
Labor relations specialists	70,050	36.00	74,870	35.21

Figure 11: U.S. Bureau of Labor Statistics Table of Occupational Employment and Wages as of May 2020.[lvi]

42. In addition, firms will need to pay for rapid tests, poster boards, consultants, etc., to comply with the ETS. Vertex estimates this cost to be at least $10,000 per year per firm. As of the date of this declaration, the cost of a "COVID-19 Antigen Rapid Self-Test at Home Kit" is approximately $25.[lvii, lviii] The total cost over a six-month period for each firm to comply with the ETS is estimated at $45,591.60 (Figure 12). When $45,591.60 is multiplied times the number of covered firms (7,722), the total cost for six months of adherence is over $352 million, or five times the estimate by OSHA ($78 million). Also, it is unlikely that the covered firms will shed the additional human resource specialist if the ETS lasts exactly six months. It is likely that employment will be closer to one year, which means that costs will be well north of the $352 million figure.

Average Hourly Wage - Human Resource Specialist (2020)	$	30.52
Full Time Working Hours Per Year		2,000
Cost of Salary	$	61,040.00
Cost of Fringe Benefits (33%)	$	20,143.20
Annual Cost to Employer	$	81,183.20
Misc. Costs	$	10,000.00
Total Cost Per Year	$	91,183.20
Total Cost Over 6 Months	$	45,591.60
Subject Firms		7,722
Estimated Total Cost	$	352,058,335.20
OSHA is off by a factor of:		5

Figure 12: Estimated costs for covered construction firms to comply with the ETS, which is 5X OSHA's estimate.

43. In sum, OSHA underestimates the cost of compliance of the ETS. A realistic estimate for a six-month period is at least $352 million, all to encourage a small pool of construction workers that are not vaccine-hesitant, not already vaccinated, and do not fall under the outdoor exclusion.

Conclusions

44. The ETS is unreasonable, prejudicial, and disruptive to the small percentage of construction contractors that is subject to the ETS, as written. Of the 701,477 construction firms in the US, the ETS only applies to 7,722 firms, which employ approximately one-third of the construction workforce. These contractors work on razor-thin profit margins and operate in a financially high-risk sector. Burdening this pool of contractors would be disruptive because the ETS adds significant administrative expenses to these firms, and it will cause the departure of a large portion of their current workforce to firms that are not regulated by the ETS.

45. Moreover, the regulated firms will be working on jobsites with many unregulated firms, which defeats the purpose of the ETS. Furthermore, a large portion of construction is performed outdoors or in open-air settings, which differentiates construction from other OSHA-regulated industries. In addition, construction is one of the largest end-users of PPE, so the enforcement of mask-wearing is already in place. Also, ETS compliance will be difficult if not impossible due to the sheer number of tests mandated by the ETS as well as the high demand and overall shortage of test kits in the US. Lastly, if placed into effect, the ETS, barring any workforce departures except for the pool of vaccine-hesitant workers, will only cover a small pool of construction employees at a cost exceeding $352 million to be borne by the covered construction firms, which makes little sense.

DECLARATION

Pursuant to 28 U.S.C. § Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is correct.

Executed on this 19th day of January, 2022, in Denver, Colorado.

/s/ William J. McConnell

William J. McConnell PE, JD, MSCE

(Signed copy of document bearing signature of William J. McConnell is being maintained in the office of the Filing Attorney)

[i] OSHA's Emergency Temporary Standard Summary, found at: https://www.osha.gov/sites/default/files/publications/OSHA4162.pdf
[ii] Id.
[iii] Id.
[iv] Id.
[v] Pdf page 221 of 490 of the ETS Preamble.
[vi] https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html
[vii] Id.
[viii] Pdf page 63 of 490 of the ETS Preamble.
[ix] Pdf pages 62-63 and 68 of 490 of the ETS Preamble.
[x] Pdf page 66 of 490 of the ETS Preamble.
[xi] Pdf page 6 of 490 of the ETS Preamble.
[xii] Per BLS data, out of the 2,299,277 workers that work for firms with greater than 100 people, 948,572 (41 percent) work for the types of firms that operate predominately outside. The firms that operate predominately outside include Heavy & Civil Contractors (NAICS 237), Foundation / Structure / Building Exterior Contractors

(NAICS 2381), and Site Preparation Contractors (NAICS 23891). See https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html

[xiii] Pdf page 204 of 490 of the ETS Preamble.

[xiv] Pdf page 205 of 490 of the ETS Preamble.

[xv] https://www.mckinsey.com/industries/advanced-electronics/our-insights/navigating-opportunity-in-the-us-personal-protective-equipment-market

[xvi] https://www.jlconline.com/coronavirus-construction-limits-state-by-state-tracker

[xvii] https://www.constructiondive.com/news/new-yorks-covid-19-action-plan-could-limit-constructions-essential-status/592183/

[xviii] https://www.agc.org/coronavirus/safety-health-environmental-resources and

[xix] https://www.artba.org/coronavirus/

[xx] Pdf page 229 of 490 of the ETS Preamble

[xxi] CPWR-The Center for Construction Research and Training. [2022]. COVID-19 Vaccinations in Construction [dashboard].

[xxii] Pdf page 227 of 490 of the ETS Preamble.

[xxiii] CPWR-The Center for Construction Research and Training. [2022]. COVID-19 Vaccinations in Construction [dashboard].

[xxiv] Id.

[xxv] https://www.roofingcontractor.com/articles/95635-survey-shows-construction-workers-most-hesitant-group-to-get-covid-vaccine

[xxvi] https://www.constructiondive.com/news/study-construction-covid-shot-unvaccinated-workers-quit-if-forced-vaccine/611456/

[xxvii] https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html

[xxviii] https://data.bls.gov/timeseries/LNU04032231?amp%253bdata_tool=XGtable&output_view=data&include_graphs=true

[xxix] Id.

[xxx] https://www.census.gov/construction/c30/c30index.html

[xxxi] https://www.adp.com/spark/articles/2019/02/construction-grows-but-baby-boomers-retiring-leaves-gap.aspx

[xxxii] https://apnews.com/press-release/pr-newswire/baby-boomers-health-coronavirus-pandemic-2623521753c7a1c82738fd1151df7332

[xxxiii] https://www.bls.gov/iag/tgs/iag23.htm

[xxxiv] https://fred.stlouisfed.org/series/TTLCONS

[xxxv] https://www.bls.gov/iag/tgs/iag23.htm

[xxxvi] https://fred.stlouisfed.org/series/TTLCONS

[xxxvii] CCI Reports from Q2 2017 through Q3 2021: www.uschamber.com

[xxxviii] https://www.uschamber.com/infrastructure/commercial-construction-contractors-upbeat-outlook-despite-worsening-material

[xxxix] CCI Reports from Q2 2017 through Q3 2021: www.uschamber.com

[xl] Id.

[xli] https://fred.stlouisfed.org/series/JTS2300QUR

[xlii] https://www.constructiondive.com/news/study-construction-covid-shot-unvaccinated-workers-quit-if-forced-vaccine/611456/

[xliii] https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html

[xliv] https://www.cnn.com/2021/12/22/health/us-coronavirus-wednesday/index.html

[xlv] https://www.cnbc.com/2022/01/05/drugstores-struggle-to-keep-covid-at-home-tests-in-stock-as-omicron-rages-across-us.html

[xlvi] https://covidtracking.com/data/national

[xlvii] Pdf page 238 of 490 of the ETS Preamble.

[xlviii] Pdf pages 235-236 of 490 of the ETS Preamble.

[xlix] https://www.statista.com/statistics/250577/domestic-market-share-of-leading-us-airlines/

[l] https://www.enr.com/ext/resources/Issues/National_Issues/2021/05-May/31-May/ENR05312021_TOP400_compressed.pdf
[li] Pdf page 275 of 490 of the ETS Preamble.
[lii] Id.
[liii] Pdf page 335 of 490 of the ETS Preamble.
[liv] Pdf pages 335-336 of 490 of the ETS Preamble.
[lv] https://www.bls.gov/news.release/pdf/ecec.pdf
[lvi] https://www.bls.gov/oes/current/oes_nat.htm
[lvii] https://www.walgreens.com/topic/promotion/covid-testing.jsp#!
[lviii] https://www.cvs.com/shop/home-health-care/home-tests/home-covid-test