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# Construction Contractor’s Initial Reactions and Responses to the COVID-19 Pandemic in the South Central US

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Based on the novel coronavirus, COVID-19, businesses throughout the US were affected by closures, by status as essential or nonessential businesses, and by other new and unforeseen regulations which were implemented with little notice. In order to understand how these changes affected construction contractors, a short survey was created. The survey was initially distributed in May 2020, so responses are based on initial reactions to the pandemic. The survey questions included both yes/no and long-answer response types. Additionally, virtual focus group discussions occurred through a university industry advisory board and the local AGC chapter. The multiple data sources provided an opportunity of the triangulation of the data to produce a more robust view of the issue. From the survey long-answer questions and the focus group discussions, a thematic analysis was performed. Many themes were found in all three sources demonstrating the most common responses in regards to safety and operations.

**Keywords:** COVID-19, Construction, Contractors, Pandemic

## Introduction

The construction industry has experienced many changes through the years. The most recent changes can be attributed to the required immediate response to the pandemic. These changes are substantial and have impacted the industry similar to the numerous updates in personal protection equipment (PPE) over time as research on health and safety has progressed. Contractors have quickly adapted the updates in handwashing and face coverings as additional new PPE requirements along with other costly safety measures while the economy slowed.

The Associated General Contractors of America (AGC) reported in March 2020 that Coronavirus (COVID-19) was starting to affect construction through delays, logistics issues in obtaining material and personal protection equipment (PPE) and worker concerns (AGC, 2020). Close to 5,500 U.S. projects have been delayed by COVID-19 as of June (ConstructConnect, 2020). There are a variety of

publications issued on the topic mitigating risk and legal issues associated with the construction industry response to COVID-19 (Prinsloo, 2020).

Some of the recent changes seen on jobsites have been observed before as ways to mitigate the risk of infection of other illnesses at different times throughout history. Although generalized, using masks in public can be associated with good hygiene practices (Wada et al., 2012) It was common that once H1N1 was identified in a community, reported hand-washing increased (Lau et al., 2011). In addition to these past changes, during the SARS epidemic, individuals were urged to take their temperature daily and practice social distancing. Disinfection of areas inhabited by infected individuals was also encouraged (Bell & WHOS, 2004). These interventions are all similar to what we are currently seeing as suggestions or requirements to limit community transmission of COVID-19. The Centers for Disease Control and Prevention (CDC) has issued guidelines for construction workers (CDC, 2020). These guidelines include handwashing stations, social distancing, and face coverings.

As the COVID-19 pandemic began to affect the United States, students and industry members contacted faculty about upcoming summer internships. A regularly scheduled industry board meeting was already set for late April. The agenda for the Zoom advisory board meeting included typical spring meeting topics, but at the end allowed time for an industry discussion of the effects of COVID-19 on Construction. In addition to concerns communicated directly, the board members also listed concerns about the impending changes due to the pandemic. Members of the Associated General Contractors of America Oklahoma branch had also scheduled a webinar for the same day to discuss best practices for COVID-19 in construction. The discussions centered around new safety and operational protocols. Both the Zoom meeting and AGC webinar were recorded.

Based on the information communicated in both the advisory board meeting and AGC webinar, it was determined that experiences seemed to be varied among contractors and a survey should be disseminated to industry members to determine the various ways that they were affected. In addition, a second survey was created to focus on the broader industry and capture how the changes in the construction industry might be affecting Architects, Engineers, Owners, and other construction related sectors. The broader industry view will be addressed in a subsequent paper.

## **Methodology**

A short survey, "COVID-19 and Construction - Contractor," was developed in Google Forms for Contractors. A link to the survey was posted on social media including university construction program pages on Facebook and LinkedIn. The survey was also emailed out to contractors who were active on university advisory boards and/or recruiting at universities in Oklahoma. Fifty unique respondents provided information for the survey, with thirty-eight providing contact information for possible future discussions. All respondents were asked to provide their location, their business construction sector, typical split between public and private funding sources, and if work had slowed. More specific COVID-19 response questions included whether a workforce density reduction had occurred and the business recommendations for Personal Protection Equipment (PPE) at the office and/or on site. Long-answer questions asked about the effects of the COVID-19 response on employees and provided the opportunity for respondents to add any other thoughts on the COVID-19 response. A similar survey was produced for Owners and Engineers, "COVID-19 and Construction - Owners and Engineers." The questions were slightly different asking location, type of business and typical funding source.

Due to the variety of data collection types, which included meeting transcripts and a survey instrument which included some long-answer questions, a thematic analysis was performed. For the virtual meetings, meeting notes were taken and reviewed against the recording for accuracy. Those notes were then compared and reviewed. Through the review process, a group of themes were identified. Braun and Clarke provide an overview of thematic analyses. Thematic analysis is a flexible method to review long answer questions, typically from the perspective of developing more succinct questions (2006). However, as thematic analysis is subjective, there can be a question as to its validity (Nowell et al., 2017). For thematic analyses performed on long-answer written responses, a more objective approach can be used. Using the computer to review the number of times a response is provided may be considered more objective (Halverson et al. 2014). However, all of these approaches still take an active coder reviewing the responses and developing the themes.

The thematic data collected from the survey was triangulated with the themes from the AGC webinar and the advisory board meeting. In qualitative research methods, the use of triangulation refers to using multiple methods or sources to collect or analyze the data centered on one topic (Patton, 1999). There are four types of triangulation identified by Denzin (1978) and Patton (1999) which include the following: method triangulation, investigator triangulation, theory triangulation, and data source triangulation. In this study three of the four types of triangulation were employed-- method, investigator, and data source. The data was collected through different methods using both a survey and two meeting transcripts. The data was coded and the thematic analysis was checked and reviewed by three researchers. Additionally, the data sources varied for the survey and the meetings. The participants had the commonality that they were all in construction and had some connection with Oklahoma State University, however the participants varied.

## Summary of Data

### *Survey Summary*

#### *Respondent Demographics*

The location map below shows where the contractors identified that they perform work. Most respondents do business in the Oklahoma and Texas markets. Responses are expected to focus on how those states responded to the crises and defined essential businesses. See Figure 1. Of the 50 respondents, 42 identified individual states where their company provides services. Some respondents indicated their company worked in multiple locations. One respondent works outside the US.

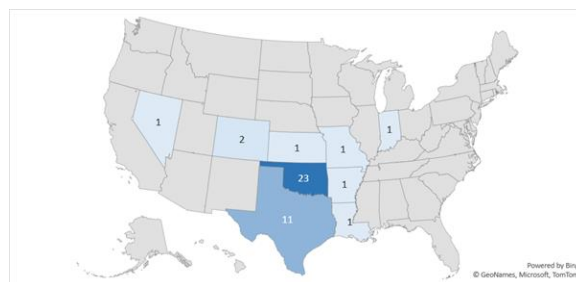


Figure 1: Location of construction markets where respondents perform work

Respondents provided their industry sector to identify how they relate to construction. Fifty construction professionals responded, and many of the contractors work in multiple sectors of the industry, so they marked multiple sectors making the number of sectors represented larger than the number of respondents. Commercial construction was the most common, however there were responses from company representatives from heavy/civil, industrial, and residential construction. There was also one demolition contractor represented. See Figure 2.

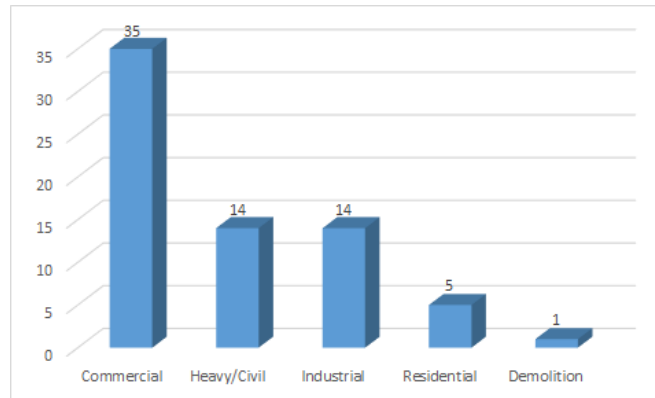


Figure 2: Industry Sector(s) of the respondents

Based on location and industry sector, respondents were asked about their funding sources and expected business slowdowns as of April 2020. Again, as it was early in the pandemic, contractors were trying to predict what would happen. On a side note, construction usually increases the work force over the summer with interns. The potential slowdown was a short term concern as well as a long term recession concern.

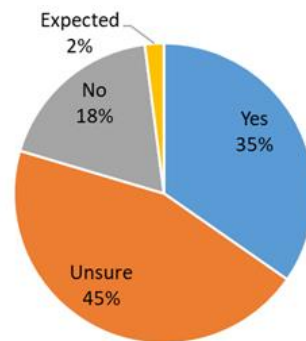


Figure 3: Has your business seen a slowdown in work being put into place?

With one third of the businesses seeing an immediate slowdown, effects can be seen in hiring and forecasting work. Other respondents expected a future slowdown, but had not seen an immediate slowdown in business. The unsure category may be related to the level of employment of respondents. For recent graduates, their knowledge of business development may be limited.

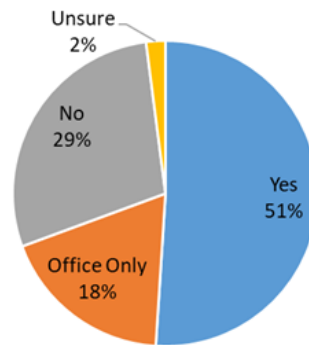


Figure 4: Has your business reduced population at the office and/or on site?

Seventy-three percent of respondents indicated the number of workers at the office and/or on site were reduced. Additional responses in long answers identify that many meetings went virtual to support this endeavor.

### *Survey Long Answer Summary*

The survey asked the following questions, “How has COVID-19 affected your employees?,” “What type of recommendations has your business issued for PPE at the office and/or on site?,” and “Would you like to add anything else about COVID-19 and construction, your business, or employee population?”. The responses were reviewed combined into like themes. The most common responses to each question are presented below, in the order of frequency of response.

In regards to how the virus has affected employees, the most common answer was loss of productivity. This loss of productivity was due to many reasons including: sickness, quarantining, adjusting to new work processes and rules, additional paperwork and mental stress. The second most common response was that there has been little to no impact, followed by remote work for office staff. Other notable themes were COVID-19 screening, fear and/or mental stress and layoffs and staff reduction.

The responses to the contractor’s recommendations for PPE at the office or on site overwhelmingly mentioned face-coverings whether they were masks, gaiters, and/or face shields. Social distancing was also notable with handwashing stations and hand-sanitizer being readily available. The survey respondents also frequently mentioned additional cleaning and temperature checks. Interestingly, five respondents mentioned no on site meetings with subs and another five mentioned working from home when/ if possible.

Some contractors also took the opportunity to share a bit more about COVID-19 and construction. The most common theme expressed was that the construction industry will look different after the pandemic. Contractors have seen that some of their employees can effectively work from home, and maybe not all of the current office space is needed and the previously preferred open office layout is not great during a pandemic. This could change not only design, but the amount of space needed and possibly a downturn in office construction. The virtual tools that have been used to work remotely and the technology that has been implemented to help with coordination have worked. This has produced more options for collaboration that are expected to stay after the virus is gone. Another response to COVID-19 that is expected to stay is some of the new cleaning measures.

### *IAB Meeting Summary*

A central U.S. university holds bi-annual Industry Advisory Board (IAB) meetings which support the construction program. The IAB had a regularly scheduled meeting for April 2020, which was shortly after the university had moved to virtual learning. The IAB meeting was held virtually and planned extra time at the end of the meeting to discuss the effects of COVID-19 on construction. Fourteen different contractors from multiple sectors of construction participated in the discussion.

The discussion covered business in the state and how most jobs are business as usual. Contractors working in multiple states found that the California markets were seeing jobs shut down. Contractors working in the healthcare industry were also seeing jobs shut down due to the pause in elective procedures and slow reimbursement by the government. Contractors working in the education sector were seeing jobs accelerated as they were not having to work around as many phasing obstacles.

There was also discussion on the modified work environment in both the office and in the field. Many referred to a split time approach where half or less of the management team was on the job, and the other half was working from home. In the field a new set of daily protocols had been adopted. Many projects had only one point of entry where each employee was given a COVID-19 questionnaire and temp check upon arrival. All workers were required to wear mandatory face coverings on site and in the job trailer and social distance as much as possible. The contractors talked about keeping crews together, and not intermingling them to reduce the number of people each worker has contact with at work. Some contractors were also enforcing each subcontractor having their own designated port-a-john to avoid cross contamination of crews.

### *Webinar Summary*

A webinar was hosted by the Oklahoma AGC in April 2020 to discuss the current state of the industry. In mid-March, Oklahoma had moved to close “non-essential” businesses. At the end of March, the list of “essential” businesses was expanded (Forman, 2020). The AGC held a virtual meeting largely to discuss best practices on the jobsite in response to COVID-19 as construction had resumed in the state. The meeting was hosted by the Chief Executive Officer of the state building chapter of the AGC. Joining him was a senior superintendent and a senior project manager, each from large competing commercial contractors in the region.

Many of the topics discussed in the webinar were somewhat similar to the IAB meeting discussion. However, the webinar lasted about an hour and the IAB discussion was about fifteen minutes, so the webinar discussion provided more depth and breadth on the topic. In addition to the topics listed in the IAB meeting, the webinar discussion focused on the initial concerns of material delays including PPE, job shutdowns and slowdowns, cost and time lost due to COVID-19, employment and unemployment, and employee mental health. Both contractors committed to offering information to other contractors on their supply chains for PPE to keep everyone working safely.

More details about the modified work environment in the field emerged including some of the initial challenges like getting thermometers, sanitizer, foggers, nitrile gloves. Best practices in providing a daily sticker once each worker was screened, staggering start times for subs to limit congestion around the gang boxes, and required subs to have a plan to reduce the spread of the virus were discussed. Additional challenges were also shared including getting buy-in to the new COVID-19

standards and breaking old habits. Some activities, like concrete placing, cannot be performed with workers six feet apart, so there were challenges with educating both the workers and nearby general public on the mitigation strategies to reduce the spread of COVID-19.

There are lots of unforeseen costs associated with the mitigation of COVID-19 on the construction site. Unplanned expenses include PPE, extra handwashing and bathrooms, job shutdowns for deep cleaning or for multiple cases, and just lost time due to the extra measures needed to keep everyone safe. These extra costs are being collected and communicated with clients, however some owners are willing to help cover them and others are not.

Unemployment claims and hiring had some noticeable changes. In the early stages of the virus, many employees filed for the extra \$600 weekly benefit, and some workers were in a position to make more money if they stayed at home. This put extra stress on employers who were dealing with a labor crisis before the pandemic especially if you add those choosing to take the unemployment to those at-risk employees who needed to stay home. With respect to the reduction of workers there was also discussion on hiring during the pandemic. The contractors noted a considerable reduction in the resumes coming in the door, and reported that they were being very selective on the new hires.

The mental health of employees was also a concern addressed by the construction leaders. The contractors are stressing communication with employees whether it be updates, virtual dinners, or just crew check-ins. They are also encouraging the use of employee assistance programs, phone counseling if needed. The contractors pointed out that many people are working from home with both their spouse and children there, so they are trying to be flexible when they can.

## Discussion of Themes

All of the data sources provided valuable information that capture the initial reactions and responses of contractors to the COVID-19 pandemic. When looking at the comprehensive data collected and the themes from each data source and how they correlate and connect, one can get a more complete view of the issue. While all the data collected is important in providing breadth in describing the phenomenon, finding recurring themes in multiple sources increases confidence in the findings (Fielding & Fielding 1986).

A few notable themes could be found in multiple data sources. One major theme was the loss of productivity which in turn correlates with lost time and has cost implications. In the AGC webinar a comment was made that everything seems more difficult, more checks, more cleaning and there is still the same amount of time in every day. The screening, cleaning, handwashing/sanitizing, masking and social distancing were also common among all the data sources. It was clear that the CDC guidelines were well known and being used as best practices throughout the responding contractors.

With construction being designated an essential business in the region, it was not surprising that early on in the pandemic some contractors reported they had felt little to no impact. However, it was interesting that in the group, there were a similar number of contractors that were feeling a downturn in the market with some jobs slowing or shutting down and the subsequent staff reductions due to the reduction in work.

Construction employees work environments and mental health were also consistent themes. The contractors seemed surprised with many of the work from home successes, and the productivity that

employees were able to maintain working from home. It will be interesting to see in the future how many jobs don't go back to the traditional office setting for 40-hour plus work weeks. Additionally, the concern for employee mental health was high. The contractors were concerned and encouraged employees to seek help when needed.

## Conclusion

Through the review of focus group discussions with both a university industry advisory board and the local AGC chapter, a group of themes was developed. Similarly, review of survey long answer questions also provided themes. A thematic analysis was performed to determine overarching themes. The themes are all within the context of construction and the COVID-19 pandemic. Initial coding immediately identified terms which are familiar in the COVID-19 response, like face coverings, hand sanitizer and social distancing. However, additional more construction specific responses also became apparent. Contractors immediately felt the loss of productivity due to a number of different issues including, but not limited to: sickness, quarantining, adjusting to new work processes and rules, additional paperwork and mental stress. While some contractors reported little to no impact initially, others immediately recognized a downturn in the industry. The construction contractors did report some adaptations to the workplace due to COVID-19 that might stay include more work from home options, new collaborative IT solutions, and new cleaning measures on the jobsite.

The COVID-19 pandemic has proved to be a challenge for the construction industry. The initial response of the ever-changing construction industry was heavily reliant upon CDC guidelines and contractors trying to keep construction work moving as an essential business. The industry adapted, and some changes are expected to stay as they were seen as improvements and advancements.

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