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Introduction

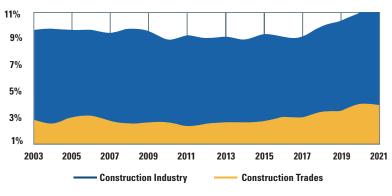
The United States is at a critical economic point in time.

anufacturing is seeking to develop onshore capacity to respond to supply chain disruptions. The energy sector is attempting to decarbonize to respond to environmental and regulatory pressures. Government and industry are investing in infrastructure to rebuild roads and bridges, expand public transit, and upgrade the power grid. These initiatives represent significant economic and national security interests that cannot be accomplished without a robust construction sector. Unfortunately, the construction industry continues to struggle to recruit and retain highly skilled craft professionals. The following research proposes this can be partially solved by recognizing the benefits women bring to project sites and making the necessary changes to recruit and retain them.

Industry studies have documented the trends around craft labor shortages and the dilemmas the industry faces with recruiting and retaining skilled craft professionals. Women are frequently cited as an important demographic that could help solve the craft labor shortages. However, the industry has largely overlooked the positive impact that employing women could bring. While the most recent U.S. Census estimates that women comprise 50.5% of the U.S. population, they still make up just 11% of the overall construction workforce (Figure 1). This percentage has increased in recent years, but much of this increase is confined to women in managerial, technical, and administrative roles. In fact, within construction craft professional positions, where the greatest shortages exist, less than 4% are women (Figure 1).

This leads to some obvious questions: Why are women significantly underrepresented within the construction trades? What qualities do women bring to jobsites that lead to improved project outcomes? What can contractors do to better recruit and retain women in the industry? The National Center for Construction Education and Research (NCCER) decided to not only find the answers to these questions but to also find solutions. NCCER quickly realized that numbers and statistics only tell part of the story. To get the answers we were looking for, we needed to talk to the tradeswomen themselves. NCCER conducted focus groups across North America with 176 tradeswomen to better understand their unique contributions to the construction industry and get their opinions on how to make the industry a preferred choice for women.

Their collective experiences provided incredible insight and resulted in specific strategies for increasing participation of women. This paper documents their perspectives on how to increase the number of women in the construction craft workforce to meet the challenges facing the nation in their own words.



Percentage of Women In Construction

Figure 1: Percent of Women in U.S. Construction (BLS Data)

How Women Can Improve Project Outcomes

Some in the construction industry view recruiting women into the trades as simply a way to make up for the quantity gap in the skilled construction workforce. This view is incomplete because it ignores the unique qualities women bring to the jobsite that contribute to an improved work environment. The focus group participants were asked, "What unique qualities do women bring to project site success?" The most frequently noted benefits were: focus on teamwork, attention to detail, jobsite cleanliness and organization, and improved safety performance. Figure 2 summarizes their responses based on the benefits identified during these discussions. The box size in the chart depicts the frequency of response for each category.

These specific benefits were not just identified by the women themselves, but also by members of project

management teams who participated in separate focus groups. A further discussion ensued around how technology and engineering reduced or removed the reliance on physical strength and improved efficiencies. This led the management team members to share how women are much more focused on following the prescribed work process as designed instead of relying on experience and physical strength. This can result in positive effects on safety and reduce injuries. Furthermore, it was stated that women often follow the plan and think through how they can complete the work without rushing. They tend to follow directions and pay more attention to how they are performing tasks, which leads to a consistent focus on details (Ibarra and Obodaru, 0. 2009).

Additional data affirms the positive impact tradeswomen have on overall crew performance. A survey of 2,780 construction craft professionals asked respondents to rate their personal performance record (including safety, attendance, quality, productivity, and initiative) for the



Figure 2: Tree map frequency distribution for the benefits women bring to the construction industry



"We look out for each other. We associate [with] each other as individuals and as a group."

previous year. Respondents with at least one woman on their work crew reported higher individual performance than those in all male crews, and the difference was statistically significant (Construction Industry Institute RT-370). This correlates with the focus groups' identification of teamwork being a benefit women bring to project sites (Figure 2). The women emphasized that many of their male colleagues largely focused on personal and individual achievements rather than the overall performance of the crew. In contrast, women are more focused on making sure that the entire team is functioning at a high level rather than on their own individual achievements. This type of support spreads beyond just the technical aspects of the job and into the emotional health of the team. With the increased awareness and focus on mental health, this type of positive impact on crew dynamics can have lasting effects beyond the project site.

Finally, keeping a clean and organized jobsite, better known as housekeeping in OSHA 1926.25, is a recognized element in project productivity and safety performance. The Laborers' Health and Safety Fund of North America highlighted the importance of housekeeping, stating, "Housekeeping is not just cleanliness. It includes keeping work areas neat and orderly." They also highlighted the importance of continual housekeeping stating, "Keeping a site clean and organized is an ongoing operation. Periodic 'panic' cleanups are costly and ineffective in reducing accidents. Housekeeping must be done regularly, not just at the end of the shift" (Parsons 2013). The tradeswomen repeatedly noted that they were more attentive to continually maintaining a clean and organized jobsite than their male colleagues and management agreed.

Despite the significant benefits offered by tradeswomen, the construction industry has largely neglected to include them. Rebuilding the U.S. manufacturing, energy, and transportation infrastructure is a multi-generational challenge that will require a diverse workforce that leverages all facets of our society to overcome it. This same diversity brings benefits beyond sheer numbers and ultimately results in a better work environment, project execution, and safety.

Strategies For Recruiting and Retaining Tradeswomen

We asked the focus groups how to bring more women into the craft professional workforce. These frank conversations led to the identification of key challenges to be addressed and specific strategies that could be implemented. Figure 3 summarizes the suggestions from these conversations in a tree map diagram that visually represents the frequency of the topics discussed.

Address Discrimination and Sexual Harassment

Despite repeated efforts over the years, the construction industry still struggles with discrimination and harassment. Although progress in addressing these issues has improved in the office environment, it has not adequately improved in the field. In fact, based on our research, sexual harassment is still identified as the number one issue in the field that construction leaders need to address (Figure 3). Further supporting this point, a survey of 2,740 craft professionals (94.7% men and 5.1% women) from all 50 states were asked to describe their jobsite experience from "agree" to "disagree" in relation to the following categories: respect, unprofessional treatment, and derogatory comments. (Construction Industry Institute RT-370).

Figure 4 on page 7 shows the survey results for these statements. The pie charts in Figure 4 on page 7 illustrate the survey results showing the difference between the responses of the men and women participants. Across all three categories of respect, unprofessional treatment, and derogatory comments, tradeswomen reported a worse experience than their male colleagues with a statistically significant difference. These results show that despite discussions and awareness around discrimination and harassment, the construction industry still has a great deal

Address Discrimination and Sexual Harassment	Ensure Consistent Hiring Practices	Accommodate Mothers	Treat Women Equally	
	Offer Training Opportunities	Other	More Women Improve Site Jobsite Leadership Experience	

Figure 3: Tree map of responses on how to better recruit and retain women in the trades

of work to do. For those construction leaders currently working on this issue, the suggestion from the focus groups was to get feedback from women in the field to determine if it is having a positive impact. In fact, creating women resource groups that meet monthly or quarterly provide great feedback for the company, help women feel connected, and provide a greater sense of belonging.

Our research found an effective place to start is by establishing and publishing a policy related to sexual harassment prevention that explicitly defines the organization's position and a transparent process for complaints. For example, Bird Construction publicly posts their expectations for ethical behavior on their website where it clearly states they will not "tolerate unlawful discrimination, threats, violence, harassment or other unacceptable behavior in the workplace." Additionally, Bird retains a third-party service to receive complaints, which are then assessed and handled by the management team. This allows reporting to be anonymous and holds the company accountable to act on the complaint. This top-down, transparent commitment to address harassment decreases the chance for misunderstandings of expectations, policies, and processes. Based on our discussions in the focus groups, establishing corporate policy and accountability creates a noticeably more positive work culture.

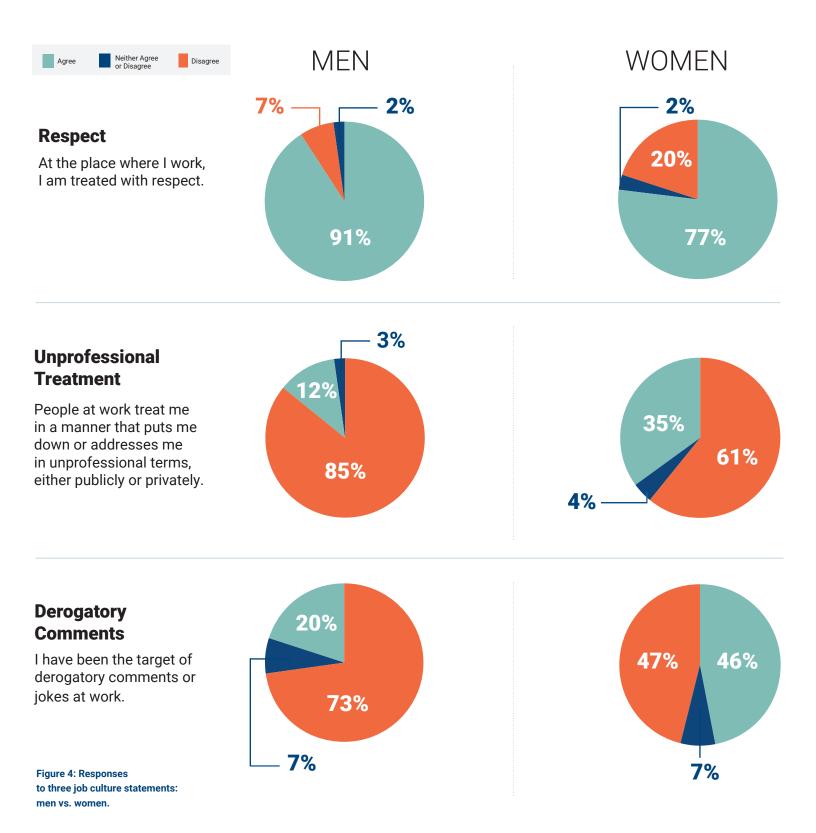
"[Employers] need to do something so men learn to work with women. A lot of the guys that I've worked alongside have never worked with a woman before." – Focus Group Participant

Ensure Consistent Hiring Practice

Unfortunately, just getting hired by some construction companies still appears to be an obstacle for women. The women talked openly about the bias that exists in hiring practices within our industry. Several of the women talked about applying for craft positions and not receiving a response from the companies. As soon as they reapplied using gender-neutral names, like Chris instead of Christine, they were contacted immediately about the opening. The sentiment among the groups was that tradeswomen cannot contribute or demonstrate their abilities if they are not able to get through the door and prove themselves.

Several women talked about applying for craft positions and not receiving a response from the hiring companies. As soon as they reapplied using gender-neutral names, like Chris instead of Christine, they were contacted immediately about the opening.

Responses to Three Job Culture Statements



The women also noted that, in many instances, knowing someone at the company was critical to getting hired. Some companies require recommendations before they interview an individual for a position. Although this type of policy may help companies filter out unqualified job applicants, it makes it more difficult for new people to enter the industry who do not have connections. Since women are significantly underrepresented within the construction industry already, those trying to get in are even less likely to know someone to serve as a reference. This type of hiring practice is not only restrictive but seems to support the stereotype that our industry is trying to overcome.

Accommodate Mothers

The third most frequently cited barrier by women in the construction industry is the lack of flexibility to care for families (Figure 3). As progressive as our society is, women are still the primary caregivers for young children and aging parents. During the COVID-19 pandemic, women took on three times more childcare responsibilities than men (Avi-Yonah 2021). Additionally, women spend 15% more time per month as caregivers to aging parents compared to men (RBC Wealth Management).

Women working in the field are more affected by scheduling and juggling family responsibilities than women working in an office environment. A survey of 770 women in construction found that 25% of tradeswomen reported facing disciplinary action for missing work to attend to family emergencies. Whereas only 4% of women in managerial, administrative, and technical positions reported being disciplined for missing work for similar reasons. Fifty-seven percent of tradeswomen indicated that their company provides no Paid Time Off (PTO) for their position while only four percent of women in managerial, administrative, and technical positions reported receiving no PTO. Companies should have consistent and equal PTO policies across the organization to avoid creating disparities between field and administrative teams.



A survey of 770 women in construction found that 25% of tradeswomen reported facing disciplinary action for missing work to attend family emergencies. Whereas only 4% of women in managerial, administrative, and technical positions reported being disciplined for missing work for similar reasons. The construction industry is not alone in managing how family responsibilities impact their employees. A study by Insights Workplace Business Research found that 40% of working women with children under 10 years old were considering leaving work or downsizing their careers due to the challenge of balancing work and family responsibilities (Insights Workplace Business Research 2022). This opens an opportunity for the construction industry. If construction firms can find a way to address childcare challenges, they could become the preferred industry for many mothers and families. Since flexibility related to family responsibilities was such an overriding need among focus group participants, we included information from three of the largest national childcare providers that offer longer daycare and after-school hours and bussing options. We also listed some other specific suggestions the women posed. See Appendix A for more information.

Offer Training Opportunities

Training has long been identified as one of the elements individuals are looking for when choosing a job and ultimately a career. Each of the focus groups discussed the need for established training programs to bring women into the industry and specifically into the crafts, (Figure 3). Despite research showing the benefits craft training has on the bottom-line (Construction Industry Institute RT-231, RT-335), much of the construction industry continues to struggle with providing effective training programs. This has a negative impact, not only on project performance, but also on recruiting and retaining craftworkers in general. More importantly, in this context, the shortage of effective craft training affects women disproportionally more than men.

Young girls naturally receive less exposure to construction skills than boys of the same age. In general, young girls do not participate in assisting their families in areas such as home or car repair. This means that many never have the opportunity to explore their potential interest or aptitude in a skilled trade or related field. This pattern continues as young women advance through the educational system and is evident in the education and training women choose to "Women have to have more options for flexible hours or childcare because a lot of women are the providers and they're also the Caregivers." – Focus Group Participant

pursue after high school graduation. The national estimates of enrollment for women in secondary and post-secondary construction-based programs range between 10% (NCWGE) and 20% (Clayton 2022).

The women we spoke with talked a great deal about how the craft training they received opened doors for them and created loyalty to the companies who provided it. Some of the tradeswomen with a particular firm started out in basic

Many of the focus group women reported that they are routinely assigned "easier" or "basic-level tasks" than their male colleagues. roles, such as a bus driver or custodian. Once they were exposed to construction, they were interested in advancing for both financial reward and personal empowerment. These women noted that without established training programs and information posted on sites about the opportunities training could bring them, they would have never been able to learn the skills they needed to advance.

Treat Women Equally

The women in our focus groups identified the need to be treated equally on the jobsite and the need to have the same opportunities for learning and advancement as men. If they are unable to participate in all aspects of a project site, they will always have less knowledge and skills than their male counterparts. For example, many of the focus group women reported that they are routinely assigned easier or more basic tasks than their male colleagues. This denies women the opportunity to learn, hone and demonstrate their proficiency, and advance within their craft. Another situation identified by many of the women was that they were not allowed to do hard or heavy jobs because they were women. While their male colleagues may have good intentions in their efforts to be courteous, this type of behavior denies women the chance to be fully engaged in their craft and can cause resentment and friction on the teams. As previously noted, modern construction is designed to be executed with tools and equipment that eliminate the need for excessive human strength to accomplish the task. Overall, the message from the women was that they fully expect to be held to the same standard, receive the same training, have the same career advancement opportunities, and get the same pay if they do the same work.

Increase The Number of Women in Site Leadership Positions

The construction industry theoretically provides a variety of career paths to reach leadership positions; however, most of the women in the focus groups reported rarely or never having a female supervisor. Confidential company data available to the researchers back up this perception as female representation among foremen and superintendents is the lowest among the management levels in the construction industry. A survey of 272 tradeswomen found that 57% have never had a female supervisor during their time in the industry. However, 69% of the same tradeswomen indicated that they wanted to be in a leadership position at some point in their career. This is a clear sign of a disconnect in the leadership pipeline. This discrepancy between women seeking leadership roles but not seeing other women in leadership positions can directly affect the retention of women at a company and in the industry as a whole.

There are likely several contributing factors. The most obvious is that foremen, general foremen, and superintendents typically come up through the trades as they gain experience and opportunity. Since there are fewer women within the skilled trades, there is not a pipeline available for site leadership positions. Recruiting more women can certainly help increase the pool, but without a clear and intentional plan in place to identify and develop potentials, the issue will continue.

With this in mind, a company needs to develop and implement a plan to identify women early in their careers

"We just want to be treated equally. Make it an even playing field. Just treat me like you would everybody else."

- Focus Group Participant



A corresponding survey of 272 tradeswomen found that 57% have never had a female supervisor during their time in the industry. However, 69% of the same tradeswomen indicated that they wanted to be in a leadership position at some point in their careers.

who have the leadership traits the company seeks. As previously described in Figure 2, women tend to be better communicators, adhere to established policy, care more about team performance than individual performance, are detail-oriented, and are often focused on safety. These same characteristics tend to be on lists of what companies are looking for in field leadership positions. Furthermore, having a leadership track specifically for women is not only a good motivator and retention tool for the women in the field, but it is good for the company culture.

Companies have made great strides in increasing women in engineering and administrative/management positions; however, due to the nature of the construction industry, these types of positions are not visible to women working in the field. For example, one of our focus groups was held on a large petrochemical jobsite where the tradeswomen reported there were no women in leadership roles on the project. Surprisingly, we found out that the owner's on-site project manager was a woman. The fact that the tradeswomen did not know this demonstrates the need for more visibility of women leaders to those in the field. This will not only inspire other women but will also display the confidence a company has in women leaders. Companies looking to attract and retain women should ensure female leadership is visible across the organization in a meaningful, impactful, and productive manner.

Improve Jobsite Experience

It is not as easy to make accommodations for women on a construction site as it is in an office environment; however, that does not mean that those same accommodations are not needed or should not be addressed in the field. The two areas the groups discussed the most were bathroom facilities and properly fitted workwear/equipment.

Although neither of these were surprising, the specifics and suggestions are important.

The discussion around bathroom facilities has been going on for years. Unfortunately, not much has changed outside of painting the facilities pink and putting locks on the doors. The women noted the lack of access to restroom facilities that were stocked with feminine hygiene products and the lack of a way for appropriate and discreet disposal of these products. The groups told stories about trying to discreetly carry feminine products into a temporary toilet and the lack of trash cans inside for them to dispose of them.

Our research team contacted four national portable toilet service companies, and none of them provide feminine hygiene products or trash cans as part of their service contracts. Contractors should request this in service contracts and consider this when hiring sanitation service providers.

One contractor overcame this limitation by having their custodial service keep the women's temporary toilets stocked with products and ensured that a trash can was adjacent for proper disposal. The women at this site noted that this seemingly small gesture by the employer significantly improved their jobsite experience. Addressing this barrier is simple if the contractor is serious about making their project sites welcoming for women. Another obstacle that will only be solved through demand is having work clothing and Personal Protective Equipment (PPE) that fit appropriately. The focus group women noted that properly fitted clothing and boots contribute to feelings of comfort and enhanced safety. Most construction protective equipment and clothing are not designed to fit women; however, improperly fitted PPE is identified by OSHA as a health and safety concern. For example, most safety harnesses and vests are made for men, so regardless of how they might be adjusted, they may not fit all women properly.

Although there has been an increase in the availability of workwear options designed for women over the past 10 years, women starting in the industry may be unaware of these resources. Companies should provide their female employees with a list of clothing and protective wear options that are available. Appendix B provides a collection of companies that cater to workwear for women.

As the number of women in the industry increases, the availability of suitable workwear options should increase as well. However, without access and understanding of where to go, this demand will not be captured, and women will continue to lack the essentials they need to be successful on jobsites.

Focus group participants noted that properly fitted clothing and boots contribute to feelings of comfort and enhanced safety. Most construction protective equipment and clothing are not designed to fit women; however, improperly fitted PPE is identified by OSHA as a health and safety concern.

Conclusions

People are retiring from the construction industry much faster than new people are being hired. Statistics show that for every four people leaving our industry, only one enters. There are predictions that as many as 1.9 million craft professionals will be needed by 2025. We have depended for way too long on word of mouth hiring from family members of the current workforce, expecting people to be waiting at union halls, and assuming that increasing wages will attract more people to our companies. It is time for us to rethink the makeup of our workforce—not for the sheer numbers needed—but for building better teams, creating a better work environment, and ultimately becoming an industry of choice for everyone.

We are competing against industries that are providing work from home options, shorter work weeks, and daycare support. Although we cannot always match these types of benefits, we do offer what many individuals are searching for in a career - unlimited career opportunities, contributions to the betterment of society, pride in their work, and income that supports families. If we want construction careers to be a viable option, we have to change not only the culture of our companies and projects, but we also have to change the culture and perception of our industry. This starts with recognizing that we are not effectively appealing to the largest percentage of the population. We need to create a work environment that actively addresses issues such as the elimination of harassment and discrimination, support for childcare, more training, and more leadership opportunities for women at the project level. Our project sites must become places where we are comfortable having our wives, sisters, and daughters working. This will not happen overnight, but we can be sure it will not happen at all if we do not make intentional and visible changes.

Appendix A: Childcare Resources

The women had several more suggestions to assist with childcare issues.

1. Predictable Work Hours. Women are able to better schedule childcare options when they have set work hours. One company we spoke with set their work schedule. This same company made weekend work optional rather than mandatory for all craft professionals.

2. Other Accommodations. Several women mentioned that in theory, they had enough time to drop off and pick up children from daycare centers. In reality, the shift change on a large industrial project could be time-consuming and take up to an hour to exit the parking lot. A suggestion was made to designate parking spots for mothers, which would allow them to get out quicker at the end of the day. These types of simple accommodations can build loyalty within workers as can asking tradeswomen for their input in ways companies can help allow women to manage their family responsibilities. Some large employers, in a variety of industries, have offered on-site childcare as one solution. Others have provided assistance with daycare and afterschool programs through a corporate benefit for which there are both federal and state tax breaks available. There are a few national programs that offer minimal fees. Several of the care providers allow corporate participants to relocate their children between different childcare facilities. This might allow parents to change jobsite locations without the stressful and time-consuming process of locating a new daycare.

Table 1 shows an overview of three national corporate discount program childcare providers. All of these providers offer longer hours, bussing, and multiple locations. This list is not exhaustive but provides a general idea of the current state of corporate childcare programs.

COMPANY	Kindercare	Bright Horizons	Learning Care Group
Locations	1700	Over 1,100	Almost 1,100
States	46	39	40
Hours of Operations	6:00 a.m 6:30 p.m.	11 -12 Hours Max	6:00 a.m 6:30 p.m.
Child Age Range	6 Weeks - 12 Years	6 Weeks - 12 Years	6 Weeks - 12 Years
Standardize Curriculum	Yes	Somewhat	Yes
Before & After School Program	Certain Locations	Certain Locations	Certain Locations
Bussing Program	Certain Locations	No	Certain Locations
Set Up Fee On for site Childcare	\$2,500	\$5,000	\$2,500
Employee Discount for On site	10%	None	Yes

Table 1: Overview of Corporate Childcare Options from Kindercare, Bright Horizons, and the Learning Care Group.

Appendix B: Women's Workwear Options

Providing women in your organization with a list of companies that focus specifically on workwear for women in construction is one more way to show commitment to female employees. Table 2 shows a list of companies with a focus on women's workwear. Experienced tradeswomen within your organization will likely have clothing and gear recommendations for new entrants, so their input should be collected by any company looking to increase the representation of women in the construction trades.

	Carhartt Women's Workwear	Ariat Woman's Workwear	Covergalls*	Dovetail Workwear*	P&F Workwear*	SafetyGirl*
Founded	1998	2021	2014	2018	2007	2002
Top/Bottoms	x	x	х	Х	x	х
Workboots	х	х			х	Х
Outerwear	x	x	х	х	x	х
Cover/Overalls	х	х	х	х	Х	х
РРЕ	x	х	х	х		х
Inclusive Sizing	Х	Х	х	Х	Х	Х

Table 2: Some Workwear Options for Women in Construction

*Denotes only women's workwear sold

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