

## **WOMEN IN CONSTRUCTION MANAGEMENT**

**Barbara L. Chun  
Tishman Construction Corporation of Illinois  
1 South Wacker Drive  
Chicago, IL 60606**

**David Arditi  
Illinois Institute of Technology  
Department of Civil, Architectural and Environmental Engineering  
Construction Engineering and Management Program  
Chicago, IL 60616**

**Gulsah Balci  
Chicago Commercial Contractors, LLC  
11921 Smith Drive  
Huntley, IL 60142**

### **ABSTRACT**

Labor statistics indicate that the construction industry is male dominated. According to the literature, women are reluctant to join the workforce; they experience discrimination when they apply for a job or when they are part of the workforce. A survey was conducted by the authors in 2008 to clarify the perceptions relative to women in construction management positions. The respondents consisted of (1) male construction managers who had never worked with female construction managers, (2) male construction managers who collaborated with female construction managers in the past, and (3) female construction managers. The findings indicate that female construction managers perceive bias against them in the form of skepticism and indifference as a response to their gender. Most respondents believe that female construction managers are as qualified, capable and approachable as male construction managers. Only male construction managers who had never worked with female construction managers call women's effectiveness to question. The negative

perceptions relative to women are likely to dissipate as more women are employed in construction management positions.

**Keywords:** Professional women in CM positions, CM workforce, gender bias, gender discrimination.

## **INTRODUCTION**

Executive Order 10925 [1] issued by President Kennedy created an equal opportunity committee and mandated that projects financed with federal funds "take affirmative action" to ensure that hiring and employment practices are free of racial bias. The Civil Rights Act of 1964 [2] prohibited discrimination of all kinds based on race, color, religion, or national origin while Title VII of the Civil Rights Act first prohibited employment discrimination on the basis of a person's sex. Issued by President Johnson, Executive Order 11246 [3] required government contractors to take specific measures to ensure equality in hiring. The order was amended in 1967 to cover discrimination on the basis of gender. As the affirmative action program encouraged the employment of underrepresented groups such as women, the percentage of female officials and managers which was 10.2% in 1970 increased to 29.9% in 1993 [4]. However, the construction industry has had a difficult time recruiting women to join their workforce. Although women now make up roughly 46% of the workforce [5], their presence in the construction industry is alarmingly scarce. According to the Bureau of Labor Statistics [6], the percentage of women within the construction industry as laborers made up only 3.7% of the workforce and women construction managers made up a slightly higher percentage at 7.8%.

The construction industry has always been a male dominated industry. This problem is particularly acute in the construction industry because with the continued

absence of women within their general workforce, the viewpoints of this industry have not changed much over the years [7]. This level of discrimination may be most egregious on the construction site, but it is not absent in other areas of the industry either. Indeed, women in construction management positions who are as well educated and as technically knowledgeable as their male counterparts may be susceptible to negative stigmas based solely on the industry's perception of women. The reluctance to contend with these negative perceptions is what deters some women from seeking jobs in the construction industry [8].

Are the negative perceptions relative to women in construction management positions held as truth by contemporary male and female professionals working in construction? In an effort to answer this question and to better grasp the dynamics of the male/female relationship, a survey was conducted in 2008 that focused specifically on the way women in construction management positions are perceived. The methodology of the study is described after a review of the literature on women's issues in construction is made in the next section. The findings are then reported and discussed. The conclusions of the study are presented in the last section.

## **PROFESSIONAL WOMEN IN CONSTRUCTION**

Due to its dynamic nature and unique characteristics, the construction industry differs from manufacturing industries. The work performed is mostly project-based, which means a series of temporary organizations at different geographical locations. Work conditions are generally poor as most construction work is at the mercy of the vagaries of weather conditions. Work is seasonal in some geographical areas, creating high rates of unemployment in cold winter months. Working hours are not flexible and become tighter as the project approaches the end. According to Fielden et al. [9] flexible hours are made impossible by the tight contract deadlines demanded by clients.

The construction activity is labor intensive [10]. The construction industry is the largest employer in any economy [10]. The large labor force in construction has traditionally been dominated by males. Over the last two decades, construction has remained a nontraditional field for female engineers and architects. For example, Scott and Boles [11] claim that the percentage of women in civil engineering is less than half the percentage of women in all engineering fields combined and about one-sixth the percentage of women in the most popular fields. This underrepresentation of females in construction can be explained by the dichotomy between women's educational aspirations and their professional experiences. According to Arslan and Kivrak [8], female civil engineering students are quite willing and eager to enter the construction field, and do so after graduation, but many quit working in construction after they face the difficulties caused by the ingrained culture. The image of the industry for women is one which is dirty, dangerous and lacking in equal opportunities.

The environment of the few female engineers and architects who may be entering the construction industry is generally restricted to office-based jobs [12], probably because women in the field generally encounter difficulties that include men's attitude toward women, the male-dominated culture, and a general environment of sex discrimination [8]. Consequently, according to Khazanet [13], women lack field experience which prevents them from achieving their desired career goals.

Women's other roles of mother/wife prevent them from walking as directly as men on their career path. At certain periods women need career breaks to implement their roles. Nigerian women claim that as long as they remain single, they could work in any area within the industry without much difficulty [14]. On the other hand, Kehinde and Okoli's [14] study also indicates that working in the public service with seemingly less tight schedules allow professional women in Nigeria to combine their roles as wives/mothers with their career fairly well. These findings reflect the conditions in the

Nigerian setting and are mentioned only to point out the likelihood that women in different settings may also face similar problems.

Once on the job, many female engineers and architects have encountered paternalism, sexual harassment, allegations of reverse discrimination, and different standards for judging the work of men and women [15]. Yates [16] states that women are treated with less respect by the public and industry whereas males gain respect more easily. Women may also differ from their male counterpart in terms of their personality. For example, Khazanet [13] claims that women are less pushy and advance their opinion less aggressively than males, and are more inclined to find a consensus than men, who tend to act directly.

## **METHODOLOGY OF THE STUDY**

When seeking opinions regarding the way women in construction management positions are perceived, the developer of a survey tool must be politically correct because one does not want to be perceived as being discriminatory against women. If the questions in the survey are not politically correct, it is likely that they will offend the participants. There is therefore great pressure on the developer to formulate survey questions in a way that is not offensive to respondents. Also, survey instruments are generally designed not to include leading questions that direct respondents to a specific answer. Finally, in this type of survey, participants may be more prone to contend a level of equality than may actually be their opinion unless anonymity is assured. In order to extract respondents' true views, one must let them know clearly that their responses will in no way be held against them.

The survey questions were formulated after a great deal of thought by both male and female researchers to make sure that (1) no offensive language was used; (2)

questions did not lead to a particular answer; (3) only a few essential questions were included in the survey to keep the response time low and hence obtain a high rate of response; and (4) the survey could be administered through a simple email where respondent anonymity was explicitly guaranteed. The survey included nine simple questions with predetermined answers (Appendix). The email system allowed ease of response as respondents did not have to print out or download any files, nor link to a website. Respondents sent their answers back by email.

The survey was emailed in 2006 to the 152 members of the CMAA Chicago Chapter as well as 56 construction managers engaged by the Chicago Public School System, picked at random. Of the 208 surveys that were sent, 67 completed surveys were returned, a rate of response of 32%. Of the 67 respondents, 47 were male and 20 were female.

## **ANALYSIS OF SURVEY RESPONSES**

The Mann-Whitney test was used to compare the male and female populations. The Mann-Whitney test is a nonparametric test used to test the significance of the differences between the perceptions of the two populations. When the collected data was subjected to the Mann-Whitney test, it was found that there were no differences between most of the perceptions of male and female respondents that were statistically significant at  $\alpha = 0.05$  (Table 1).

When asked whether female managers' management style is different from male managers' management style, the overall average indicates that the large majority 67% answered "No". There was no statistically significant difference between the opinions male and female respondents.

The respondents also indicated that male and female construction managers are equally qualified (average score of 0.04 on a scale of -1 representing "less qualified", 0

“equally qualified”, and +1 “more qualified”) and equally approachable (average score of 0.25 on the same -1 to +1 scale). There were no statistically significant differences between the opinions of male and female respondents.

Table 1. Mann-Whitney Test Results

Survey Items	Mann-Whitney U Statistic	P-Value	Significant difference between male and female responses at $\alpha=0.05$
Management style	362.00	0.0510	No
Qualifications	477.50	0.9635	No
Effectiveness	388.00	0.0363	Yes
Approachability	446.50	0.5915	No
Assessment criteria	324.50	0.0206	Yes
Gender advantage	97.50	0.3073	No
Industry perception	351.0	0.0295	Yes

Only the questions about effectiveness, assessment criteria, and industry perception were identified as having statistically significant differences between the opinions of the two populations.

Since there was a natural division of three groups within the survey (9 male construction managers who have never worked with female construction managers, 38 male construction managers who have worked with female construction managers, and 20 female construction managers) the Kruskal-Wallis test was chosen to further investigate the Mann-Whitney findings presented in Table 1. The Kruskal-Wallis test is also a nonparametric test but is used to compare three or more groups. The sample sizes of the groups do not have to be equal. This is due to the fact that this test takes into consideration the median value of responses. Since the likelihood of obtaining the same number of responses from all three groups is very slight, this lenience makes this test a favorable option for analyzing the three groups of responses.

Through a series of calculations and ranking of responses, the Kruskal-Wallis test determines a P value associated with the Kruskal-Wallis statistic. The tests were

conducted at  $\alpha = 0.05$ . In other words, when  $P \leq 0.05$ , there is at least 95% confidence that the differences between the perceptions of the three groups are statistically different. When  $P > 0.05$ , it means that the groups tested originated from the same population, implying that all the groups tested share the same perceptions.

When the significance level was set to  $P \leq 0.05$ , no differences were identified between the three tested groups relative to the seven survey items. However, Table 2 shows that when the significance level is relaxed to  $\alpha = 0.10$ , differences are observed in the respondents' perceptions of women's effectiveness, assessment criteria, and industry perception.

Table 2. Kruskal-Wallis Test Results

Survey Items	Kruskal-Wallis Statistic	P-Value	Significant differences between three groups at $\alpha = 0.10$
Management style	4.036	0.1329	No
Qualifications	2.892	0.2355	No
Effectiveness	5.615	0.0603	Yes
Approachability	1.023	0.5994	No
Assessment criteria	5.398	0.0673	Yes
Gender advantage	2.853	0.2402	No
Industry perception	4.806	0.0904	Yes

The question which asked "How effective are female managers in comparison to their male counterparts?" was one of three questions where the Kruskal-Wallis statistic was significant at  $\alpha = 0.10$ . By using the Dunn Post-hoc test, it was determined that the variance was between the male population that had never worked with female construction managers and the male population that had had experiences with female managers. The males who had never worked with female construction managers seemed to hold the opinion that female construction managers were less effective than their male counterparts, whereas male construction managers who had worked with



female managers before believed female construction managers were just as effective as or more effective than their male counterparts.

In regards to the significant differences in the perceptions of the effectiveness of female construction managers, one can assume that the perceptions of the males who have never worked with female construction managers were vulnerable to stereotypes that are present within the industry. One male survey participant attempted to explain why women were at a disadvantage during their review process. He wrote:

*“There are still too many “good old boys” in construction who will view women as less than men in the construction field. Most of these men are still in control of either construction companies and/or large projects and still believe that a woman cannot get the same results as a man on a project.”*

Table 3. Dunn’s Multiple Comparison Test Results

Survey Items	Females vs. males who never worked with females before		Females vs. males who worked with females before		Males who worked with females vs. males who have never worked with females	
	Difference in Rank Sum	Significant Difference between the two groups	Difference in Rank Sum	Significant Difference between the two groups	Difference in Rank Sum	Significant Difference between the two groups
Management style	-2.615	No	-8.849	No	-6.233	No
Qualifications	-7.312	No	-1.548	No	5.764	No
Effectiveness	4.684	No	-5.638	No	-10.320	Yes
Approachability	5.158	No	-1.406	No	-6.564	No
Assessment criteria	-0.294	No	10.310	Yes	10.610	No
Gender advantage	-5.192	No	1.308	No	6.500	No
Industry perception	1.103	No	-9.583	No	-10.690	No

The answers to the question “Are female managers in top positions judged by the same criteria as their male counterparts?” also indicated conflicting perceptions within the three populations, as evidenced by a Kruskal-Wallis statistic that is significant at  $\alpha = 0.10$ . The Dunn’s Multiple Comparison test indicated that this difference was between female construction managers and the male population who have worked with female construction managers. Only few of the male population believed that women were not judged by the same criteria as their male counterparts; the majority believed that they were. The women tended to hold the opposing opinion that they were not judged by the same criteria. These responses make it evident that women believe that they are treated differently than their male counterparts, good, bad or indifferent. According to the answers to the follow-up question “is being female advantageous or disadvantageous during the review process?”, both groups agreed that being female constituted a disadvantage.

Finally, the Kruskal-Wallis statistics presented in the very last row of Table 2 indicate that when male construction managers are compared to female construction managers as a whole (in response to the question “Not considering your own views, is there a negative perception in the industry, associated with women in construction management?”), the male population thinks that there is no negative perception associated with women in construction management whereas the female population contends that there is. As stated earlier, this may be one of the reasons why women tend not to seek careers in construction.

## **CONCLUSION**

The original intent of this study was to prove or disprove the existence of a negative stigma attached to women in construction management. The analysis of the responses

indicates the following, but it should be noted that the findings of this study are based on data collected from construction managers that are active in the Chicago area:

- Women in construction management positions perceive bias against them in the form of skepticism and indifference from the industry purely as a response to their gender. Indeed, the respondents agree that being female does not help when a construction management professional's performance is assessed.
- The majority of the survey participants subscribe to the modern belief that women are just as qualified, capable, and approachable as their male counterparts. Only men who have never worked with women before call the effectiveness of women to question.
- The modern school of thought that accepts women as a natural and equal part of the construction population appears to be gaining momentum. One survey participant's comments seem to explain this positive evolution well:

*“Many people (males) of an older generation still hold stereotypes toward woman. Many tradesmen still feel women have no place on the jobsite. I have worked with many females in construction in all levels of management and as trade workers and see that the stereotype is wrong and has no place in the construction world these days....The new generation does not look on women in construction management negatively. As stated above, there is an older generation that does.”*

The negative perceptions are likely to dissipate as more women are employed in construction management positions, and as more women prove to be successful in these positions. In conclusion, there is still a negative perception of the effectiveness of women in construction management positions; this is due in part to the fact that it takes

a new generation of professionals to do away with the old stereotypes. The male population that has worked with women does not acknowledge any shortcomings in regards to women's management of construction projects. One survey participant's response captures the way by which everyone should define success.

*"Success depends on the individual and not the gender."*

## REFERENCES

- [1] Executive Order 10925. (1961). *Establishing The President's Committee on Equal Employment Opportunity*, The White House, Washington, DC., <http://www.eeoc.gov/abouteeoc/35th/thelaw/eo-10925.html>.
- [2] Civil Rights Act. (1964). <http://www.ourdocuments.gov/doc.php?doc=97#>.
- [3] Executive Order 11246. (1965). *Equal Employment Opportunity*, The White House, Washington, DC., <http://www.eeoc.gov/abouteeoc/35th/thelaw/eo-11246.html>.
- [4] U.S. Department of Labor. (2002). Facts on Executive Order 11246-Affirmative Action. US Department of Labor, Employment Standards Administration, accessed on 8 September 2008. <<http://www.dol.gov/esa/ofccp/regs/compliance/aa.htm>>.
- [5] U.S. Department of Labor. (2006). *Quick Stats 2006*. U.S. Department of Labor, Bureau of Labor Statistics, Women's Bureau. Accessed on 05 February 2008. <<http://www.dol.gov/wb/stats/main>>.
- [6] U.S. Department of Labor, *Nontraditional Occupations for Women in 2006*. (March 2007). Bureau of Labor Statistics, Women's Bureau. 5 February 2008. <<http://www.dol.gov/wb/factsheets/nontra2006>>.
- [7] Post, Nadine M. (2003). "Good ol' boys' Start to Talk the Talk in Support of Women." *Engineering News Record*.
- [8] Arslan, G. and Kivrak, S. (2004). "The lower employment of women in the Turkish construction sector." *Building and Environment*, 39, 1379-1387.
- [9] Fielden, S. L., Davison, M. J., Gale, A. and Davey, C. L. (2001). "Women, equality and construction." *Journal of Management Development*, 20(4), 293-304.
- [10] Clough, R. H., Sears, G. A. and Sears, S. K. (2005). *Construction Contracting*. Seventh edition, Wiley, New York, NY.

- [11] Scott, W. and Boles, W. (1996). "Emerging high-tech areas of civil engineering attract women." *Journal of Professional Issues in Engineering Education and Practice*, ASCE, 122(1), 42-43.
- [12] Dainty, A. R. J. and Lingard, H. (2006). "Indirect discrimination in construction organizations and the impact on women's careers." *Journal of Management in Engineering*, ASCE, 22(3), 108-118.
- [13] Khazanet, V. L. (1996). "Women in civil engineering and science: it is time for recognition and promotion." *Journal of Professional Issues in Engineering Education and Practice*, ASCE, 122(2), 65-68.
- [14] Kehinde, J. O. and Okoli, O. G. (2004). "Professional women and career impediments in the construction industry in Nigeria." *Journal of Professional Issues in Engineering Education and Practice*, ASCE, 130(2), 115-119.
- [15] Committee on Women in Science and Engineering of the National Research Council. (1994). *Women Scientists and Engineers Employed in Industry: Why So Few?* Ad hoc Panel on Industry, National Academy Press, Washington, DC.
- [16] Yates, J. K. (2001). "Retention of nontraditional engineering and construction professionals." *Journal of Management in Engineering*, ASCE, 17(1), 41-48.

## APPENDIX

### SURVEY QUESTIONS

- 1 Check one  
 Male  Female
- 2 Years of experience in Construction Management  
 1 to 5  5 to 10  10 Plus
- 3 Have you ever worked for/with a female construction manager?  
 Yes  No
- 4 Do you feel that the management style of female managers differ from their male counterparts?  
 Yes  No
- 5 As related to construction, how qualified are female managers as compared to their male counterparts?  
 Less Capable  Equal in Capability  More Capable
- 6 How effective are female managers in comparison to their male counterparts?  
 Less Effective  Just as Effective  More Effective
- 7 Are female managers more approachable than their male counterparts?  
 Less Approachable  Just as Approachable  More Approachable
- 8 Are female managers in top positions judged by the same criteria as their male counterparts?  
 Yes  No

If no, is their sex advantageous or disadvantageous during the review process?

Advantageous  Disadvantageous

Explain...

---

---

---

---

- 9 Not considering your own views, is there a negative perception in the industry associated with women in construction management?  
 Yes  No