

APPENDIX E.

Entry and Advancement in the Dane County Construction Industry

Federal courts have found that Congress “spent decades compiling evidence of race discrimination in government contracting, of barriers to the formation of minority-owned construction businesses, and of barriers to entry.”¹ Congress found that discrimination had impeded the formation of qualified minority-owned businesses. In the marketplace appendices (Appendix E through Appendix I), the Keen Independent Research study team examines whether some of the barriers to business formation that Congress found for minority- and women-owned businesses also appear to occur in Dane County, Wisconsin.

Potential barriers to business formation include barriers associated with entry and advancement in the construction industry. Appendix E examines recent data on education, employment and workplace advancement that may ultimately influence business formation in the Dane County construction industry.²

A. Introduction

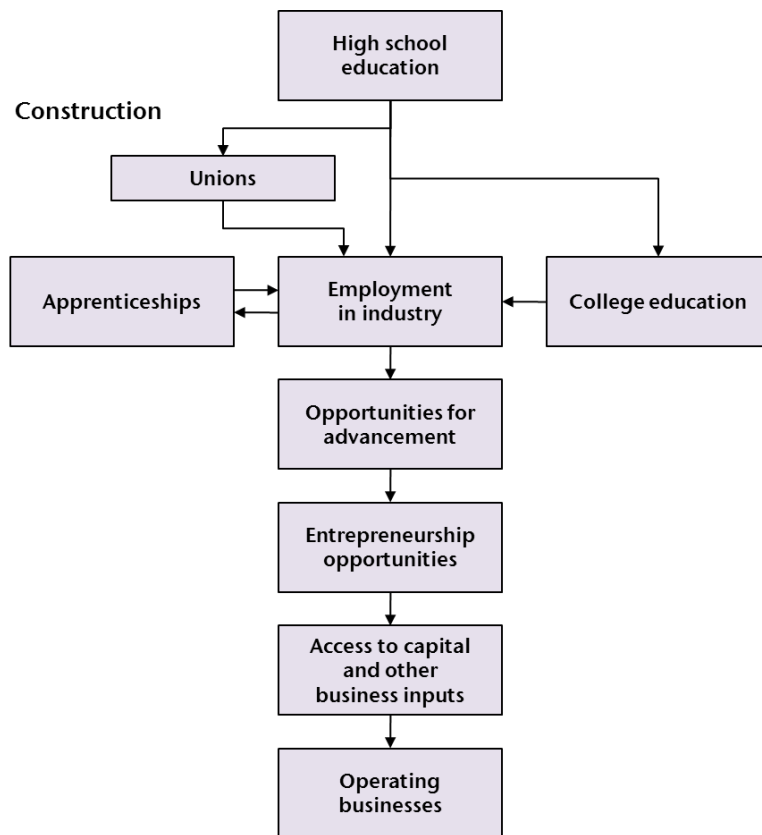
The study team examined whether there were barriers to the formation of minority- and women-owned businesses in Dane County. Business ownership often results from an individual entering an industry as an employee and then advancing within that industry. Within the entry and advancement process, there may be some barriers that limit opportunities for minorities and women. Figure E-1 presents a model of entry and advancement in the construction industry.

Appendix E uses 1990 and 2000 Census data and 2008-2012 American Community Survey (ACS) data to analyze education, employment and workplace advancement — all factors that may influence whether individuals form construction businesses. Where possible, analyses are presented by detailed race/ethnicity; in most analyses, minorities are grouped into a single category due to small sample sizes.

¹ *Sherbrooke Turf, Inc.*, 345 F.3d at 970, (citing *Adarand Constructors, Inc.*, 228 F.3d at 1167 – 76); *Western States Paving Co. v. Washington State DOT*, 407 F.3d 983 (9th Cir. 2005) at 992.

² Several other report appendices analyze other quantitative aspects of conditions in the Dane County marketplace. Appendix F explores business ownership. Appendix G presents an examination of access to capital. Appendix H considers the success of businesses. Appendix I presents the data sources that the study team used in those appendices.

Figure E-1.
Model for studying entry into the construction industry



Source:
Keen Independent Research.

Representation of minorities among workers and business owners in Dane County. As a starting point, the study team examined the representation of racial/ethnic minorities among workers and business owners in Dane County and in the United States as a whole. Figure E-2 shows demographics of business owners in construction, business owners in non-construction industries and the labor force, based on 2000 and 2008-2012 data. (Demographics of the construction industry are considered separately later in Appendix E.).

Racial and ethnic minorities comprised 10 percent of the Dane County workforce in 2000 and 15 percent of the local workforce based on 2008 through 2012 data.

Demographic analysis for Dane County in 2000 and 2008 through 2012 indicated that minority representation among business owners in construction and non-construction industries increased from 2000 to 2008 through 2012, though minorities continue to have a lower representation among construction business owners than owners in non-construction industries.

- Minority groups accounted for about 4 percent of business owners in construction in 2000 and about 7 percent in 2008 through 2012.
- Minority groups accounted for about 6 percent of business owners in non-construction industries in 2000 and about 9 percent in 2008 through 2012.

- Minorities accounted for about 10 percent of all workers in 2000 and about 15 percent in 2008 through 2012.

Representation of women among business owners and workers in Dane County. Figure E-2 also presents the representation of women among workers and business owners in 2000 and 2008 through 2012, both in Dane County and in the United States. In 2008 through 2012, women accounted for about 49 percent of the Dane County labor force and 45 percent of all non-construction business owners. However, women only accounted for 8 percent of business owners in the construction industry during those years. Similarly, on the national level, women accounted for 47 percent of the workforce, 41 percent of non-construction business owners and only 6 percent of business owners in construction.

Figure E-2.

Demographic distribution of the workforce and business owners, 2000 and 2008-2012

Dane County, WI	Business owners in construction		Business owners in non-construction		Workforce in all industries	
	2008-12	2000	2008-12	2000	2008-12	2000
Race/ethnicity						
Total minority	7.4 %	3.7 %	9.2 %	5.7 %	15.1 %	10.4 %
Non-Hispanic white	92.6	96.3	90.8	94.3	84.9	89.6
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Gender						
Female	8.1 % **	6.6 % **	44.7 %	44.1 %	48.5 %	48.7 %
Male	91.9 **	93.4 **	55.3	55.9	51.5	51.3
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
United States	Business owners in construction		Business owners in non-construction		Workforce in all industries	
	2008-12	2000	2008-12	2000	2008-12	2000
Race/ethnicity						
Total minority	24.0 % **	15.3 % **	25.9 %	18.2 %	33.9 %	27.3 %
Non-Hispanic white	76.0 **	84.7 **	74.1	81.8	66.1	72.7
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Gender						
Female	6.3 % **	7.3 % **	41.1 %	38.8 %	47.2 %	46.5 %
Male	93.7 **	92.7 **	58.9	61.2	52.8	53.5
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

Note: *, ** Denote that the difference in proportions between business owners in construction business owners in non-construction industries for the given Census/ACS year, for a given race/ethnicity/gender group is statistically significant at the 90% or 95% confidence level respectively.

Source: Keen Independent Research study team from 2000 U.S. Census 5% sample and 2008-2012 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

B. Construction Industry

Minorities as a percent of construction workforce quadrupled between 1990 (3%) and 2008-2012 (12%). Growth in the Hispanic construction workforce in Dane County accounted for the majority of the increase.

Hispanic Americans represented just over one-half of the minority construction workforce in 2008 through 2012. African Americans represented about one-fourth and Asian Americans represented about one-in-six minority workers in construction. Among the non-construction workforce, Hispanic Americans, African Americans and Asian Americans each represented about one-third of the minority workforce.

The gap between representation in construction workers and non-construction workers living in Dane County is highest for African Americans and Asian Americans. About 4.7 percent of the non-construction workforce is African American compared to 2.8 percent of the construction workforce and about 4.8 percent of the non-construction workforce is Asian American compared to 1.9 percent in construction. Relatively more Hispanic Americans are a part of the construction workforce (6.8%) compared to the non-construction workforce (5.2%).

The study team examined how education, training, employment and advancement may have affected the number of businesses that individuals of different races/ethnicities and gender owned in the Dane County construction industry in 1990, 2000 and 2008 through 2012.

Education. Formal education beyond high school is not a prerequisite for most construction jobs. For that reason, the construction industry often attracts individuals who have lower levels of educational attainment. Most construction industry employees in Dane County do not have a four-year college degree. Based on the 2008-2012 ACS, 35 percent of workers in the Dane County construction industry were high school graduates with no post-secondary education and 5 percent had not finished high school. Only 20 percent of those working in the Dane County construction industry had a four-year college degree or higher compared to 44 percent of all non-construction workers.

Race/ethnicity. Hispanic Americans working in Dane County were especially unlikely to have a post-secondary education. In 2008 through 2012, only 25 percent of all Hispanic American workers 25 and older in Dane County held at least a four-year college degree, far below the figure for non-Hispanic whites working in the region (49%). The percentage of African American (30%) workers in Dane County with a four-year college degree was also substantially lower than that of non-Hispanic whites in 2008 through 2012. Based on educational requirements of entry-level jobs and the limited education beyond high school for many African Americans and Hispanic Americans in Dane County, one would expect a relatively high representation of those groups in the local construction industry, particularly in entry-level positions.

In contrast to African Americans and Hispanic Americans, a relatively large proportion of Asian-Pacific American workers (58%) and Subcontinent Asian American workers (86%) age 25 and older in Dane County had four-year college degrees in 2008 through 2012. Given the high levels of education for Asian-Pacific Americans and Subcontinent Asian Americans, the representation of those groups in the local construction industry might be lower than that of non-Hispanic whites.

The educational attainment data support the relatively high concentration of Hispanic Americans and the relatively low concentration of Asian Americans working in the Dane County construction industry. The data do not support the relatively low concentration of African Americans among minorities working in the Dane County construction industry.

Gender. Female workers age 25 and older in Dane County achieved a similar level of education, on average, as men. Based on 2008 through 2012 data, 49 percent of female workers and 47 percent of male workers age 25 and older had at least a four-year college degree.

Apprenticeship and training. Training in the construction industry is largely on-the-job or offered through trade schools and apprenticeship programs. Entry-level jobs for workers out of high school are often for laborers, helpers, or apprentices. More skilled positions in the construction industry may require additional training through a technical or trade school, an apprenticeship, or another employer-provided training program. Apprenticeship programs can be developed by employers, trade associations, trade unions, or other groups. Workers can enter apprenticeship programs from high school or trade school. Apprenticeships have traditionally been three- to five-year programs that combine on-the-job training with classroom instruction.³ Opportunities for those programs across race/ethnicity are discussed later in Appendix E.

³Bureau of Labor Statistics, U.S. Department of Labor. 2006-07. "Construction." *Career Guide to Industries*. <http://www.bls.gov/oco/cg/cgs003.htm> (accessed February 15, 2007)

Employment. With educational attainment for minorities and women as context, the study team examined employment in the Dane County construction industry. Figure E-3 presents data from 1990, 2000 and 2008 through 2012 to compare the demographic composition of the construction industry with the non-construction workforce in Dane County.

Figure E-3.
Demographics of workers in construction and all non-construction industries in Dane County, 1990, 2000 and 2008-2012

Dane County, WI	Construction			Non-construction industries		
	2008-12	2000	1990	2008-12	2000	1990
Race/ethnicity						
African American	2.8	2.3	1.9	4.7	3.4	2.2
Asian Pacific	1.9	0.5	0.0	3.6	2.5	1.5
Subcontinent Asian	0.0	0.0	0.0	1.2	0.8	0.2
Hispanic American	6.8	1.4	0.8	5.2	3.2	1.1
Native American	0.5	0.8	0.4	0.6	0.6	0.4
Other Minority Group	0.0	0.0	0.0	0.0	0.2	0.0
Non-Hispanic white	88.0	95.0 % **	96.9 % **	84.8 %	89.4 %	94.6 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Gender						
Female	10.1 % **	9.5 % **	8.9 % **	50.4 %	50.9 %	50.2 %
Male	89.9 % **	90.5 % **	91.1 % **	49.6 %	49.1 %	49.8 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
United States	Construction			Non-construction industries		
	2008-12	2000	1990	2008-12	2000	1990
Race/ethnicity						
Total minority	32.9 % **	24.5 % **	11.0 % **	34.0 %	27.5 %	22.3 %
Non-Hispanic white	67.1 % **	75.5 % **	89.0 % **	66.0 %	72.5 %	77.7 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %
Gender						
Female	9.1 % **	9.9 % **	6.9 % **	50.0 %	49.2 %	45.3 %
Male	90.9 % **	90.1 % **	93.1 % **	50.0 %	50.8 %	54.7 %
Total	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

Note: *,** Denote that the difference in proportions between workers in construction and workers in non-construction industries for the given Census/ACS year, for a given race/ethnicity/gender group is statistically significant at the 90% or 95% confidence level respectively.

Source: Keen Independent Research study team from 1990 and 2000 U.S. Census 5% sample and 2008-2012 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Race/ethnicity. Based on 2008-2012 ACS data, 12 percent of people working in the Dane County construction industry were part of a minority group compared to only 5 percent in 2000. Minority groups in Dane County made up a smaller percentage of workers in construction (12%) than in non-construction industries (15%).

Overall, the percentage of construction workers who are minorities has increased in Dane County over the past two decades (3% in 1990, 5% in 2000 and 12% in 2008 through 2012), as has the percentage of all Dane County workers in non-construction industries who are minorities (5% in 1990, 11% in 2000 and 15% in 2008 through 2012).

Gender. There were large differences between the percentage of all non-construction workers who were women and the percentage of construction workers who were women in Dane County in 2008 through 2012. During those years, women represented 50 percent of all non-construction workers in Dane County but only 10 percent of construction workers.

Academic research concerning the affect of race- and gender-based discrimination. There is substantial academic literature that has examined whether race- or gender-based discrimination affects opportunities for minorities and women to enter construction trades in the United States. Many studies indicate that race- and gender-based discrimination affects opportunities for minorities and women in the construction industry. The literature concerning women in construction trades has identified substantial barriers to entry and advancement due to gender discrimination and sexual harassment.⁴ Research concerning construction projects in three major U.S. cities (Boston, Los Angeles and Oakland) identified evidence of prevailing attitudes that women do not belong in construction, and that such discrimination was worse for women of color than for white women.⁵

Importance of unions to entry in the construction industry. Labor researchers characterize construction as a historically volatile industry that is sensitive to business cycles, making the presence of labor unions important for stability and job security within the industry.⁶ The temporary nature of construction work results in uncertain job prospects, and the relatively high turnover of laborers presents a disincentive for construction firms to invest in training. Some researchers have claimed that constant turnover has lent itself to informal recruitment practices and nepotism, compelling laborers to tap social networks for training and work. Those researchers blame the importance of social networks for the high degree of ethnic segmentation in the construction industry.⁷ They argue that African Americans and other minorities faced long-standing historical barriers to entering the industry, because they have been unable to integrate themselves into traditionally white social networks that exist in the construction industry.⁸

Construction unions aim to provide a reliable source of labor for employers and preserve job opportunities for workers by formalizing the recruitment process; coordinating training and apprenticeships; enforcing standards of work; and mitigating wage competition. The unionized sector of the construction industry would seemingly be the best road for African Americans and other underrepresented groups into the industry. However, some researchers have identified racial discrimination by trade unions that has historically prevented minorities from obtaining employment in skilled trades.⁹ Some researchers argue that union discrimination has taken place in a variety of forms, including the following examples:

- Unions have used admissions criteria that adversely affect minorities. In the 1970s, federal courts ruled that standardized testing requirements for unions unfairly disadvantaged minority applicants who had less exposure to testing. In addition, the policies that required new union

⁴ See, for example, Erickson, Julia A and Donna E. Palladino. 2009. "Women Pursuing Careers in Trades and Construction." *Journal of Career Development*. 36(1): 68-89.

⁵ Note that those interviews took place between 1996 and 1999. Price, Vivian, 2002. "Race, Affirmative Action and Women's Participation in U.S. Highway Construction." *Feminist Economics*. 8(2), 87-113.

⁶ Applebaum, Herbert. 1999. *Construction Workers, U.S.A.* Westport: Greenwood Press.

⁷ Waldinger, Roger and Thomas Bailey. 1991. "The Continuing Significance of Race: Racial Conflict and Racial Discrimination in Construction." *Politics & Society*, 19(3).

⁸ Feagin and Imani. 1994. "Racial Barriers to African American Entrepreneurship: An Exploratory Study." *Social Problems*. 41 (4): 562-584.

⁹ U.S. Department of Justice. 1996. Proposed Reforms to Affirmative Action in Federal Procurement. 61 FR 26042.

members to have relatives who were already in the union perpetuated the effects of past discrimination.¹⁰

- Of those minority individuals who are admitted to unions, a disproportionately low number are admitted into union-coordinated apprenticeship programs. Apprenticeship programs are an important means of producing skilled construction laborers, and the reported exclusion of African Americans from those programs has severely limited their access to skilled occupations in the construction industry.¹¹
- Although formal training and apprenticeship programs exist within unions, most training of union members takes place informally through social networking. Nepotism characterizes the unionized sector of the construction industry as it does the non-unionized sector, and that practice favors a white-dominated status quo.¹²
- Traditionally, white unions have been successful in resisting policies designed to increase African American participation in training programs. The political strength of unions in resisting affirmative action in construction has hindered the advancement of African Americans in the industry.¹³
- Discriminatory practices in employee referral procedures, including apportioning work based on seniority, have precluded minority union members from having the same access to construction work as their white counterparts.¹⁴
- According to testimony from African American union members, even when unions implement meritocratic mechanisms of apportioning employment to laborers, white workers are often allowed to circumvent procedures and receive preference for construction jobs.¹⁵

However, more recent research suggests that the relationship between minorities and unions has been changing. As a result, historical observations may not be indicative of current dynamics in construction unions. Recent studies focusing on the role of unions in apprenticeship programs have compared minority and female participation and graduation rates for apprenticeships in joint programs (that unions and employers organize together) with rates in employer-only programs. Many of those studies conclude that the impact of union involvement is generally positive or neutral for minorities and women, compared to non-Hispanic white males:

- Glover and Bilginsoy (2005) analyzed apprenticeship programs in the U.S. construction industry during the period 1996 through 2003. Their dataset covered about 65 percent of apprenticeships during that time. The authors found that joint programs had “much higher enrollments and participation of women and ethnic/racial minorities” and exhibited “markedly

¹⁰ Ibid. See *United States v. Iron Workers Local 86* (1971), *Sims v. Sheet Metal Workers International Association* (1973), and *United States v. International Association of Bridge, Structural and Ornamental Iron Workers* (1971).

¹¹ Applebaum. 1999. Construction Workers, U.S.A.

¹² Ibid. 299. A high percentage of skilled workers reported having a father or relative in the same trade. However, the author suggests this may not be indicative of current trends.

¹³ Waldinger and Bailey. 1991. “The Continuing Significance of Race: Racial Conflict and Racial Discrimination in Construction.”

¹⁴ U.S. Department of Justice. 1996. Proposed Reforms to Affirmative Action in Federal Procurement. 61 FR 26042. See *United Steelworkers of America v. Weber* (1979) and *Taylor v. United States Department of Labor* (1982).

¹⁵ Feagin and Imani. 1994. “Racial Barriers to African American Entrepreneurship: An Exploratory Study.” *Social Problems*. 41 (4): 562-584.

better performance for all groups on rates of attrition and completion” compared to employer-run programs.¹⁶

- In a similar analysis focusing on female apprentices, Bilginsoy and Berik (2006) found that women were most likely to work in highly-skilled construction professions as a result of enrollment in joint programs as opposed to employer-run programs. Moreover, the effect of union involvement in apprenticeship training was higher for African American women than for white women.¹⁷
- A recent study on the presence of African Americans and Hispanic Americans in apprenticeship programs found that African Americans were 8 percent more likely to be enrolled in a joint program than in an employer-run program. However, Hispanic Americans were less likely to be in a joint program than in an employer-run program.¹⁸ Those data suggest that Hispanic Americans may be more likely than African Americans to enter the construction industry without the support of a union.

Recent union membership data support those findings as well. For example, 2012 Current Population Survey (CPS) data indicate that the union membership rate for African Americans is slightly higher than for non-Hispanic whites in the United States.¹⁹ The CPS asked participants, “Are you a member of a labor union or of an employee association similar to a union?” CPS data showed union membership to be 13 percent for African American workers, 10 percent for Hispanic American workers and 11 percent non-Hispanic white workers. In the construction industry, the union membership rate for both African American workers and non-Hispanic white workers was 17 percent. In contrast, the CPS showed that only 7 percent of Hispanic Americans in construction are union members.

Other research focusing on specific states also indicates a more productive relationship between unions and minority workers than that which may have prevailed in the past. A study by Berik, Bilginsoy and Williams found minority and white women were overrepresented in union apprenticeship programs in Oregon. Although white women and minorities were less likely to graduate compared to white men, graduation rates for those groups in the union apprenticeship programs were higher than for nonunion programs.²⁰ Similar research conducted over a ten-year period in Massachusetts found women and minorities were recruited at a higher rate for union apprenticeship programs compared to nonunion programs and that the completion rates for these groups in union programs were consistently higher than those of nonunion programs.²¹

Although union membership and union program participation varies based on race/ethnicity, the causes of those differences and their effects on employment in the construction industry are unresolved. Research is especially limited on the impact of unions on Asian American employment.

¹⁶ Glover, Robert and Bilginsoy, Cihan. 2005. “Registered Apprenticeship Training in the U.S. Construction Industry.” *Education & Training*, Vol. 47, 4/5, p 337.

¹⁷ Günseli Berik, Cihan Bilginsoy. 2006. “Still a wedge in the door: women training for the construction trades in the USA”, *International Journal of Manpower*, Vol. 27 Iss: 4, pp.321 – 341.

¹⁸ Bilginsoy, Cihan. 2005. “How Unions Affect Minority Representation in Building Trades Apprenticeship Programs.” *Journal of Labor Research*, 57(1).

¹⁹ 2012 Current Population Survey (CPS), Merged Outgoing Rotation Groups, U.S. Census Bureau and Bureau of Labor Statistics.

²⁰ Berik, Bilginsoy and Williams. 2011. “Gender and Racial Training Gaps in Oregon Apprenticeship Programs.” *Labor Studies Journal*: 36(2): 221-244.

²¹ Argyres, Anneta and Moir, Susan. 2008. “Building Trades Apprentice Training in Massachusetts: An Analysis of Union and Non-Union Programs, 1997-2007”. *Labor Resource Center Publications*. Paper 2.

It is unclear from past studies whether unions presently help or hinder equal opportunity in construction and whether effects in Dane County are different from other parts of the country. In addition, the current research indicates that the effects of unions on entry into the construction industry may be different for different minority groups.

Union membership in Wisconsin. Overall, union membership is declining in the United States and Wisconsin is no exception. Data regarding union membership in Wisconsin shows that the percentage of employed wage and salary workers who are members of a union has dropped from 15.0 percent in 2008 to 11.2 percent in 2012.²² The union membership rate for Wisconsin was at its second lowest point since comparable state data first became available in 1989. Similarly, data for the Madison metropolitan statistical area show union membership has declined from about 20 percent in 2000 to 17 percent in 2008 and 12 percent in 2013; while the percentage of workers covered by unions is slightly greater, it has also declined from about 22 percent in 2000 to 18 percent in 2008 and 13 percent in 2013.²³

Union membership among private sector construction workers in Wisconsin has also declined considerably. In 2000, nearly half (45 percent) of private sector construction workers in Wisconsin were union members. By 2013, union membership in the private sector construction industry in Wisconsin had dropped to about one-fourth (27 percent).²⁴

Other state level data confirm these results, while also highlighting the changes in racial/ethnic composition of apprenticeships. Data from the State of Wisconsin Department of Workforce Development (DWD) show active apprenticeships are on the decline.²⁵ In 2001, there were 8,890 active apprenticeships in Wisconsin construction trades. By 2014, there were only 4,361 apprenticeships in construction, a decline of 51 percent. The racial/ethnic composition of construction apprenticeships has also changed since 2001, when about 95 percent of construction apprentices were non-Hispanic white, 2 percent were Hispanic, 2 percent were African American and 1 percent were other minorities. As of 2014, total minority representation among construction apprentices had increased to 9 percent (4 percent African American, 3 percent Hispanic and 2 percent other minorities). While the minority composition has changed since 2001, there has been no change in the gender composition of construction apprenticeships over time. Only 2 percent of construction apprentices are female.

Apprenticeship cancellation and completion rates for Wisconsin construction trades vary by race/ethnicity as well, with fewer minorities completing apprenticeships compared to non-Hispanic whites. In 2003, the completion rate of all minorities was 53 percent. By 2008, the latest year for which the DWD has published 6 year cancellation and completion rates, the completion rates had dropped to 31 percent. Non-Hispanic white apprentice completion rates also peaked in 2003, with about two-thirds completing apprenticeship contracts. In 2008, the completion rates had dropped to 51 percent. Cancellation rates in the first year of apprenticeship are also higher for minorities. In 2011, 30 percent of minority construction apprenticeship contracts were cancelled compared to 16 percent of non-Hispanic whites.

²² Bureau of Labor Statistics, U.S. Department of Labor. 2014. "Union Membership in Wisconsin – 2013"

²³ Barry Hirsch and David Macpherson. 2014. "Union Membership and Coverage Database from the CPS." <http://unionstats.com> (accessed October 20, 2014).

²⁴ Ibid.

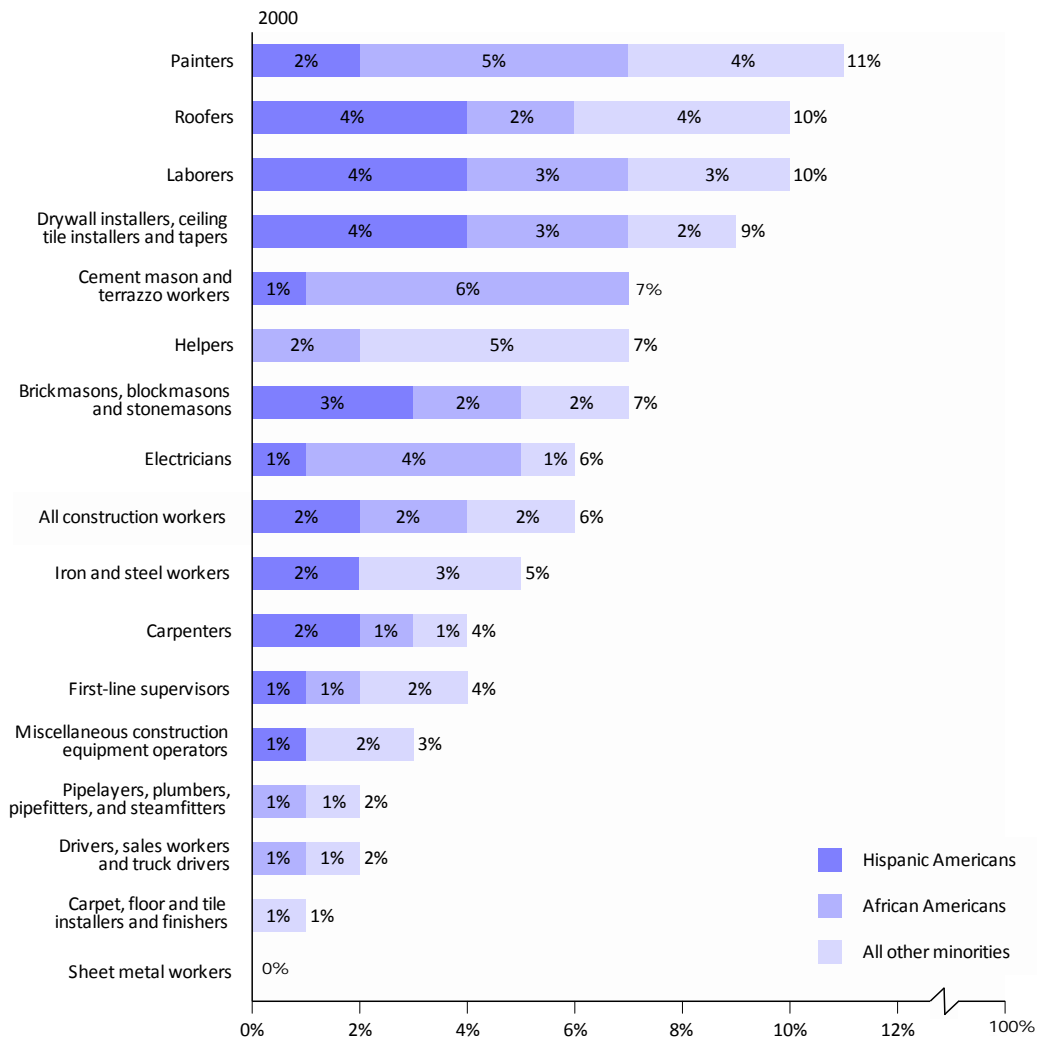
²⁵ State of Wisconsin Department of Workforce Development, Apprenticeship Statistics and Data. (2014, July). Retrieved from https://dwd.wisconsin.gov/apprenticeship/statistics_data/active_appr_characteristics_bytrade.pdf

Advancement. The study team attempted to research opportunities for advancement in the Dane County construction industry, but due to small sample sizes the study team examined the representation of minorities and women in construction occupations defined by the U.S. Bureau of Labor Statistics for the entire state of Wisconsin.²⁶ Appendix I provides full descriptions of construction trades with large enough sample sizes for analysis in the 2000 Census and 2008-2012 ACS.

Racial/ethnic composition of construction occupations. Figures E-4 and E-5 summarize the race/ethnicity of workers in select construction-related occupations in Wisconsin, including low-skill occupations (e.g., construction laborers), higher-skill construction trades (e.g., electricians) and supervisory roles. Figure E-4 and E-5 present those data for 2000 and 2008 through 2012 respectively.

²⁶ Bureau of Labor Statistics, U.S. Department of Labor. 2001. "Standard Occupational Classification Major Groups." http://www.bls.gov/soc/soc_majo.htm (accessed February 15, 2007)

Figure E-4.
Minorities as a percentage of selected construction occupations in Wisconsin, 2000

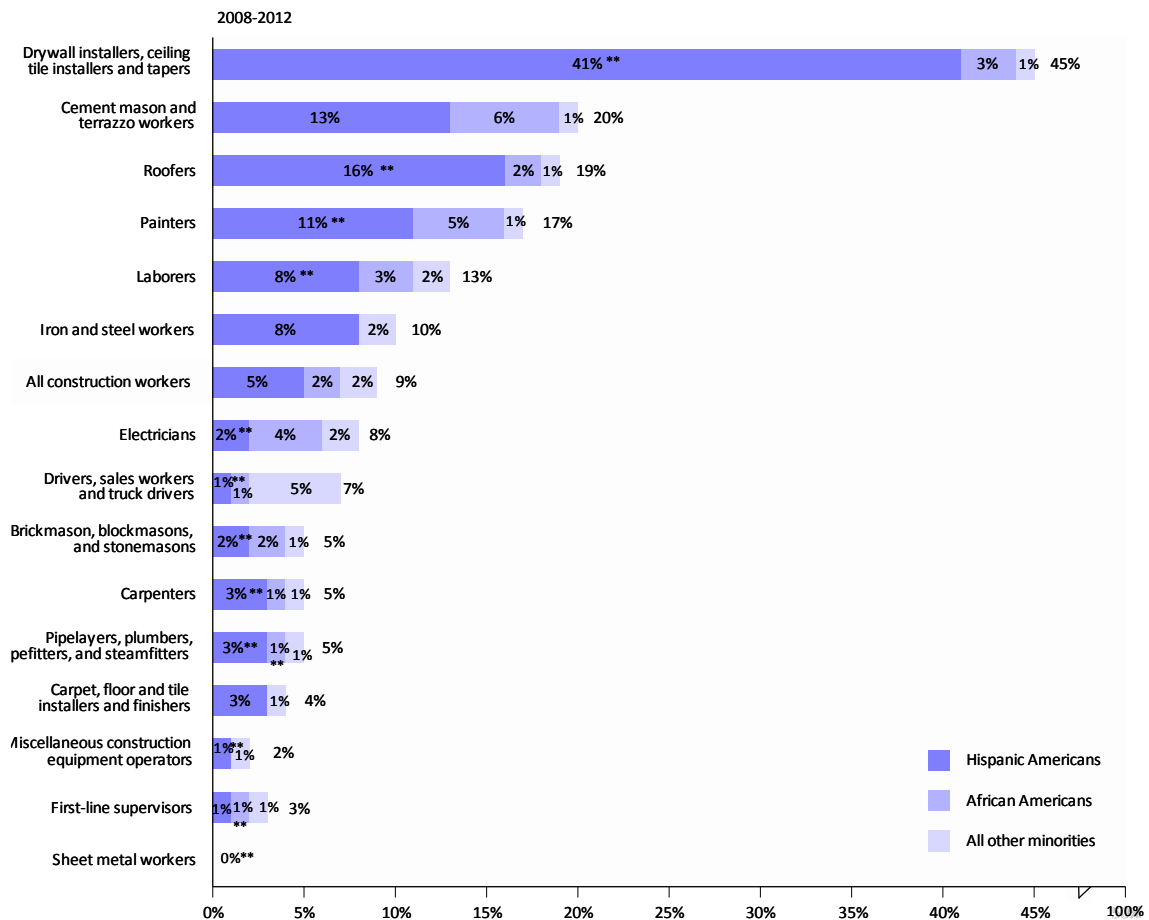


Note: *,** Denote that the difference in proportions between all workers in the construction industry and those in specific occupations is statistically significant at the 90% or 95% confidence level respectively.

Crane and tower operators; dredge, excavating and loading machine and dragline operators; paving, surfacing and tamping equipment operators; and miscellaneous construction equipment operators were combined into the single category of equipment operators.

Source: Keen Independent Research study team from 2000 U.S. Census 5% sample Public Use Micro-sample data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Figure E-5.
Minorities as a percentage of selected construction occupations in Wisconsin, 2008-2012



Note: *, ** Denote that the difference in proportions between all workers in the construction industry and those in specific occupations is statistically significant at the 90% or 95% confidence level respectively.

Crane and tower operators; dredge, excavating and loading machine and dragline operators; paving, surfacing and tamping equipment operators; and miscellaneous construction equipment operators were combined into the single category of equipment operators.

Source: Keen Independent Research study team from 2008-2012 American Community Survey data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Based on 2000 Census and 2008-2012 ACS data, there are large differences in the racial/ethnic makeup of workers in various construction trades in Wisconsin. Overall, minorities comprised 5 percent of construction workers in 2000 and 9 percent of construction workers in 2000 through 2012. Minorities comprised a relatively large share of the workforce of:

- Drywall, ceiling tile installers and tapers (9% in 2000 and 45% in 2008 through 2012);
- Cement masons and terrazzo workers (8% in 2000 and 20% in 2008 through 2012);
- Roofers (10% in 2000 and 19% in 2008 through 2012); and
- Painters (11% in 2000 and 17% in 2008 through 2012).

Some occupations had relatively low representations of minorities, including:

- Miscellaneous construction equipment operators (3% in 2000 and 2% in 2008 through 2012);
- Pipelayers, plumbers, pipefitters and steamfitters (2% in 2000 and 5% in 2008 through 2012);
- Carpet, floor and tile installers and finishers (1% in 2000 and 5% in 2008 through 2012); and
- Sheet metal workers (0% in both 2000 and 2008 through 2012).

About 3 percent of first-line supervisors were minorities in 2000, slightly less than the total percentage of Wisconsin construction workers who were minorities (5%). Minorities made up a smaller percentage of first-line supervisors (2%) in 2008 through 2012, even though the total percentage of construction workers who were minorities increased during those years (9%).

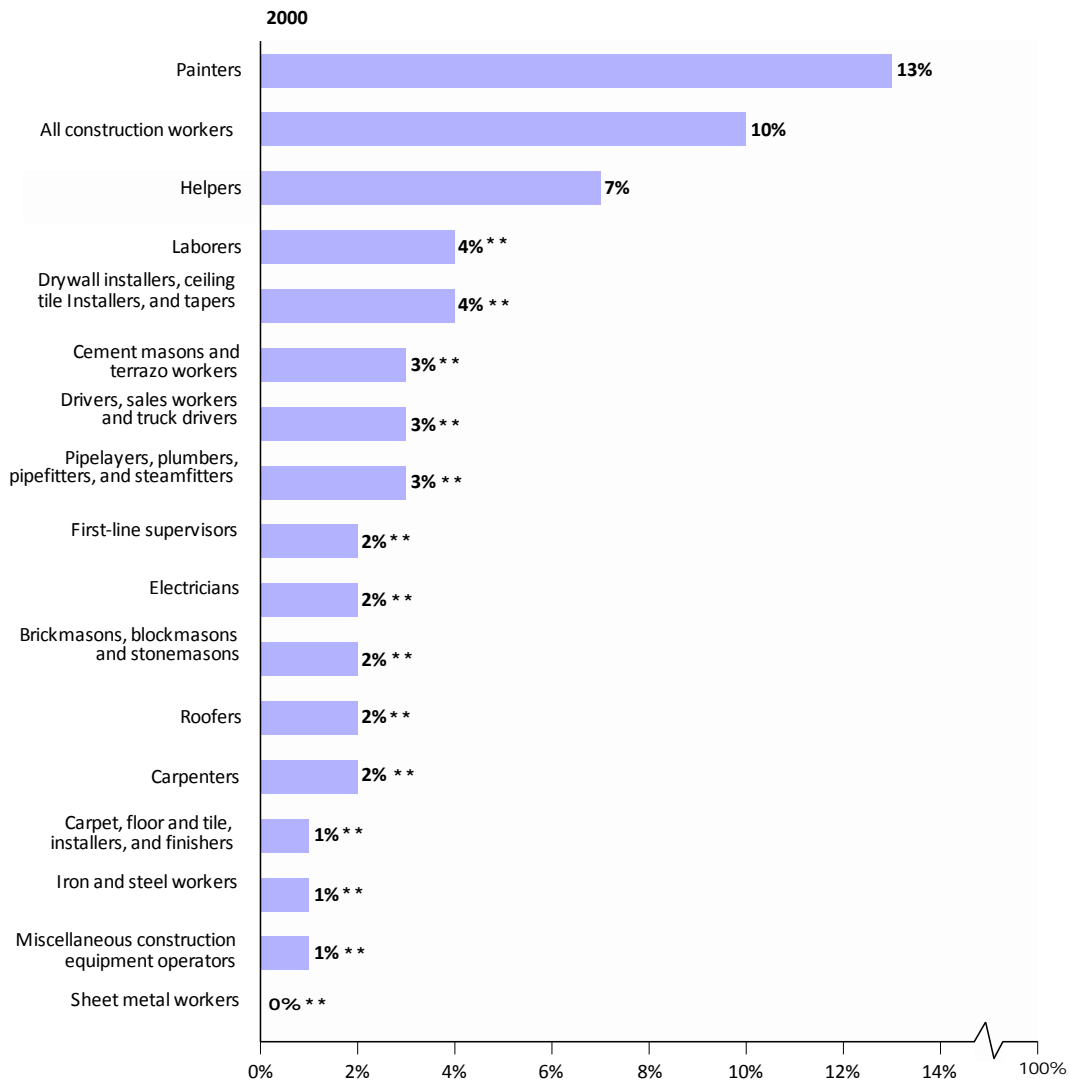
The majority of minorities working in the Wisconsin construction industry in 2008 through 2012 were Hispanic Americans. The representation of Hispanic Americans was substantially larger among drywall, ceiling tile installers and tapers (41%), roofers (16%), cement masons and terrazzo workers (13%), painters (11%) and construction laborers (8%) than among all construction workers (5%). Only 1 percent of first-line supervisors were Hispanic American in Wisconsin in 2008 through 2012.

Gender composition of construction occupations. Figures E-6 and E-7 summarize the gender of workers in select construction-related occupations for 2000 and 2008 through 2012, respectively. Overall, only about 10 percent of construction workers in Wisconsin were women in 2000 and 9 percent were women in 2008 through 2012.

In both 2000 and 2008 through 2012, less than 3 percent of workers were women in the following trades:

- Roofers;
- Brickmasons, blockmasons and stonemasons;
- Iron and Steel workers;
- Electricians;
- Carpenters;
- Sheet metal workers; and
- First-line supervisors.

Figure E-6.
Women as a percentage of construction workers in selected occupations in Wisconsin, 2000

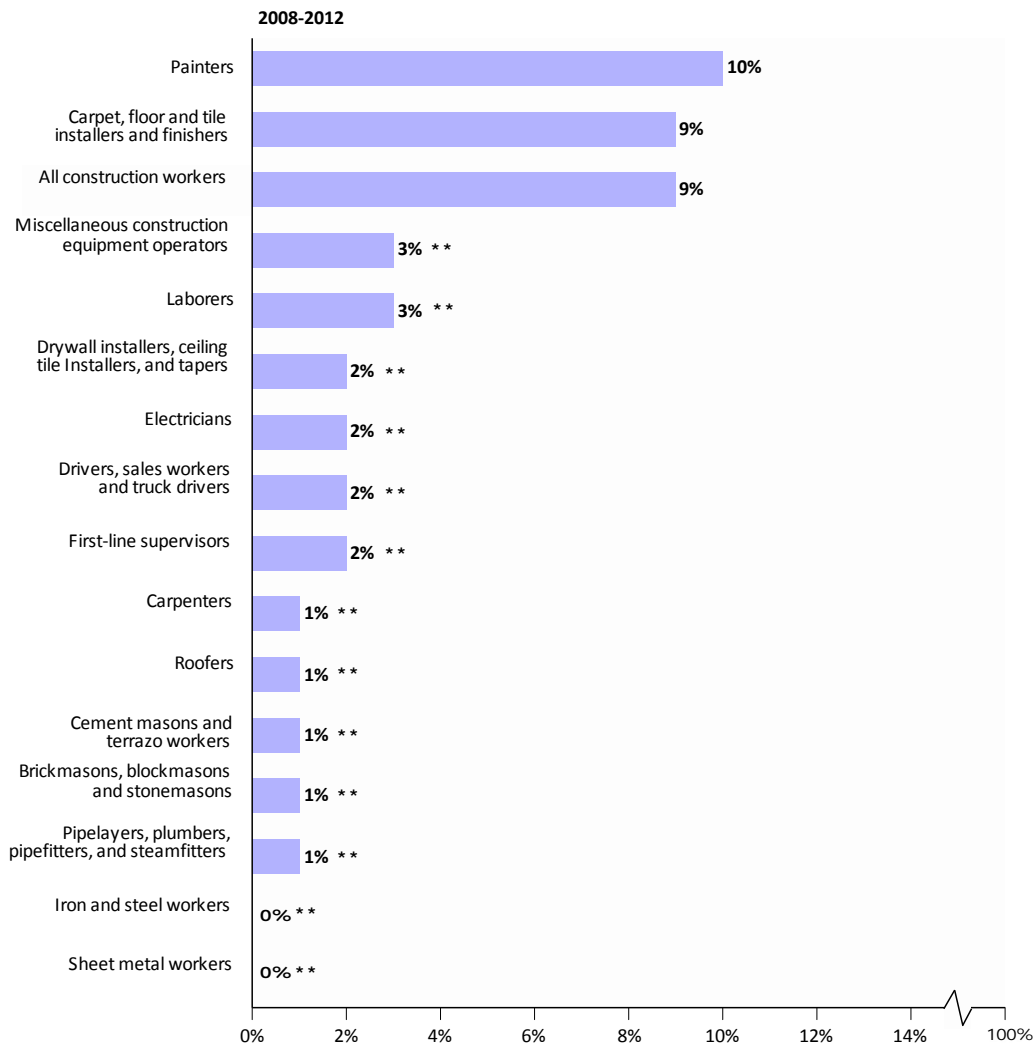


Note: *, ** Denote that the difference in proportions between all workers in the construction industry and those in specific occupations is statistically significant at the 90% or 95% confidence level respectively.

Crane and tower operators; dredge, excavating and loading machine and dragline operators; paving, surfacing and tamping equipment operators; and miscellaneous construction equipment operators were combined into the single category of equipment operators.

Source: Keen Independent Research study team from 2000 U.S. Census 5% sample Public Use Micro-sample data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Figure E-7.
Women as a percentage of construction workers in selected occupations in Wisconsin, 2008-2012



Note: **, Denote that the difference in proportions between all workers in the construction industry and those in specific occupations is statistically significant at the 90% or 95% confidence level respectively.

Crane and tower operators; dredge, excavating and loading machine and dragline operators; paving, surfacing and tamping equipment operators; and miscellaneous construction equipment operators were combined into the single category of equipment operators.

Source: Keen Independent Research study team from 2008-2012 American Community Survey data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Among all of the individual occupations listed in Figures E-6 and E-7, the following occupations showed an increase in the representation of women between 2000 and 2008 through 2012:

- Miscellaneous construction equipment operators; and
- Carpet, floor and tile installers and finishers.

Percentage of minorities and women who are managers. To further assess advancement opportunities for minorities and women in the Dane County construction industry, the study team examined differences between groups in the proportion of construction workers who reported being managers. Figure E-8 presents the percentage of construction workers who reported being construction managers in 1990, 2000 and 2008 through 2012 for Dane County and the United States as a whole. Due to small sample sizes, all minority groups are combined together and compared to non-Hispanic whites.

Racial/ethnic composition of managers. In 2000, about 9 percent of non-Hispanic whites in the Dane County construction industry were managers. Compared with non-Hispanic whites, minorities (0%) were considerably less likely to be construction managers in the Dane County construction industry. In 2008 through 2012, about 8 percent of non-Hispanic white construction workers in Dane County were managers, a statistically significant difference from the percentage of minority construction workers that worked as managers (0%). Nationally, about 3 percent of minority construction workers worked as managers in 2008 through 2012, compared to 9 percent of non-Hispanic whites.

Gender composition of managers. Female construction workers were less likely than their male counterparts to be managers in 2000 in Dane County and the United States as a whole. In Dane County in 2008 through 2012, about 7 percent of both male and female construction workers were managers.

Figure E-8.
Percentage of construction workers who worked as a manager, 1990, 2000 and 2008-2012

Note:

*, ** Denote that the difference in proportions between the minority group and non-Hispanic whites (or between females and males) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level respectively.

Source:

Keen Independent Research study team from the 2000 U.S. Census 5% sample and 2008-2012 ACS Public Use Microdata samples. The raw data extracts were obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Dane County, WI	2008-2012	2000	1990
Race/ethnicity			
Minority	0.0 % **	0.0 %	0.0 %
Non-Hispanic white	8.3	8.8	11.3
Gender			
Female	6.6 %	0.0 % **	10.6 %
Male	7.4	9.2	10.9
All individuals	7.3 %	8.4 %	10.9 %
United States	2008-2012	2000	1990
Race/ethnicity			
Minority	3.4 % **	3.2 % **	3.6 % **
Non-Hispanic white	8.7	7.5	9.3
Gender			
Female	5.6 % **	4.1 % **	10.8 % **
Male	7.1	6.7	8.0
All individuals	7.0 %	6.5 %	8.2 %

C. Summary

Keen Independent's analysis suggests that there are barriers to entry for certain minority groups and for women in the construction industry in Dane County. For the construction industry, there appears to be barriers within the industry that continue through occupational advancement.

- Fewer minorities worked in the Dane County construction industry than what might be expected based on representation in the overall workforce.
- Women accounted for particularly few workers in the Dane County construction industry.

Any barriers to advancement in the construction industry may affect the relatively low number of minority and female business owners.

- Representation of minorities and women was much lower in certain construction trades (including first-line supervisors) compared with others.
- Compared to non-Hispanic whites in the construction industry, minority workers were significantly less likely to be managers.

Appendix F, which follows, examines rates of business ownership among individuals working in the Dane County construction industry.