

**Apprenticeship Training Programs in Maryland:
A Case Study of the Construction Industry, 1990-2003**

By

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And

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March 2005

The Construction Policy Program
University of Maryland School of Public Policy

This report was done in conjunction with the Construction Policy Program at the University of Maryland School of Public Policy. The Construction Policy Program has undertaken research and policy development activities that seek to promote a better understanding of all aspects of the construction industry in the State of Maryland. A central goal of the Program goal is to study and disseminate information about policies and practices that help promote successful outcomes in the construction industry.

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Acknowledgments

We wish to thank Helene Jurgensen for her research assistance, and Alaine Gherardi for her editorial help and other assistance. We thank the Building and Construction Trades Department of the AFL-CIO for funding this project.

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Executive Summary

This study examines construction industry apprenticeship training programs in the state of Maryland from 1990 to 2003. The study compares the performance of joint labor-management programs (referred to as union programs) with the performance of nonunion apprenticeship programs (both multiple employer and single employer programs).

Enrollment Highlights

- 24,152 people enrolled in construction apprenticeship programs between 1990 and 2003. Of these, 58 percent (or 13,984) enrolled in a union program and 42 percent (or 10,168) enrolled in a nonunion program.
- The number of new apprentices grew by over 16.5 percent, from 1,865 apprentices entering programs in 1990 to 2,173 entering in 2003. The increase was entirely due to increased enrollment in union programs.
- African Americans comprised 4,217 (or 30.2%) of union apprentices, compared to only 1,674 (or 16.5%) in nonunion programs.
- Union programs enrolled a slightly higher percentage of Latino participants than nonunion programs (5.8% to 4.6%). Since union programs are larger in size than nonunion programs, 816 Latino apprentices were enrolled in union programs, while 463 Latino apprentices were enrolled in nonunion programs.
- Women comprised a small percentage of total construction apprentices, with 507 (or 3.6%) enrolled in union programs and 110 (or 1.1%) enrolled in nonunion programs.

Graduation Highlights

- 4,470 apprentices that enrolled between 1990 and 1998 had graduated by early 2004. 2,865 of the graduates (or 64.1%) were from union programs and 1,605 (or 35.9%) graduated from non-union programs.
- Union programs had a significantly higher graduation rate than nonunion programs (44.1% to 27.6%).
- Differences in graduation rates between union and nonunion programs extended to African Americans (28.8% to 19.8%) Latinos (39.8% to 16.6%) and women (25.9% to 15.9%).
- Union programs graduated a higher percentage by craft, including electricians (55.7% to 31.6%) plumbers (41.8% to 13.5%) and steamfitters (69.1% to 36.4%) than did nonunion programs.
- Union programs provided training in a wider range of crafts. Electricians comprised only 27.7 percent of all union graduates, versus 69.9 percent in nonunion programs.

1. Introduction

Apprenticeship training programs are a primary means of recruitment and training in the construction industry, as well as how most construction workers acquire the skills necessary for establishing a career in the industry. Until recently, however, few studies examined apprenticeship programs, either the demographics of enrollment and graduation, or the performance of different types of apprenticeship programs. This study examines apprenticeship training in the construction industry in Maryland from 1990 to 2003.¹

A better understanding of apprenticeship programs is needed in part because of the public resources that subsidize such programs. Apprentices are eligible for student subsidies such as Pell Grants and Veteran Administration benefits, while apprenticeship programs can also win support under the Workforce Investment Act, Job Corps, or from local community colleges. Another important public subsidy is the right given to program sponsors to pay registered apprentices less than the prevailing wage rate on state and federal construction jobs.

In addition, apprenticeship programs are increasingly a factor in the construction contract bidding process. Particularly in the public sector, the "low bid" contract award process is being replaced by alternative contracting methods that include assessments of "quality" factors. Apprenticeship programs are frequently considered a factor in measuring the quality of contractor performance, adding to the policy interest in assessing the quality and effectiveness of apprenticeship programs.²

2. The Data

Maryland is one of 27 states with delegated registration authority from the federal Department of Labor.³ The Maryland Apprenticeship and Training Program (MATP) oversees the operation of the state program. The MATP collects such information as the apprentice's gender, race, age, veteran status, and educational level, as well as the entry and exit dates and whether the apprentice completed the program, cancelled before completion, or transferred to another program.

Data is also collected about the apprenticeship sponsor. The three types of sponsors, for which data were collected, were group joint (GJ), group non-joint (GN), and individual non-joint (IN). The group joint sponsors include local unions, district councils and other union groups; the group non-joint sponsors include contractor associations, employer chapters, and other employer groups; finally, the individual non-joint sponsors consist of individual employers.

¹ See list of studies in Appendix 5.

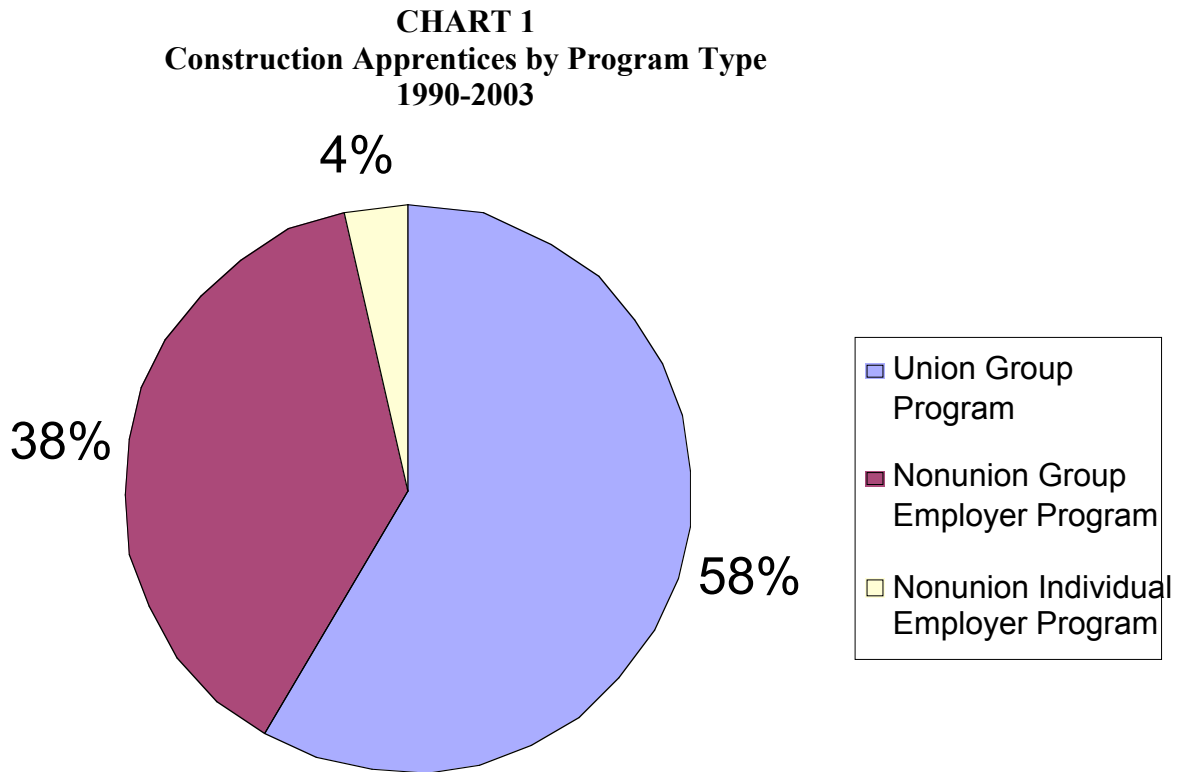
² Gerard M. Waites, Esq., "Legislative Initiatives for Building & Construction Trades Unions: Best Value Contracting, Responsible Contractor Policies, Economic Development Laws."

³ Maryland Apprenticeship and Training Program website: <http://www.dllr.state.md.us/labor/appr.html>

The copy of the database provided by MATP included all apprentices who entered the program from January 1, 1990 to December 31, 2003, although only apprentices with sponsors in the construction industry (defined by SIC codes 15, 16 and 17) were included in our analysis. [See Appendix 1 for a list of all construction industry sponsors] The resulting dataset of construction apprentices from 1990 to 2003 was used for the demographic and occupational analyses. However, because apprenticeship programs in construction are typically four to five years in length, graduation rates were calculated only from the subset of apprentices who entered the program from January 1, 1990 to December 31, 1998.

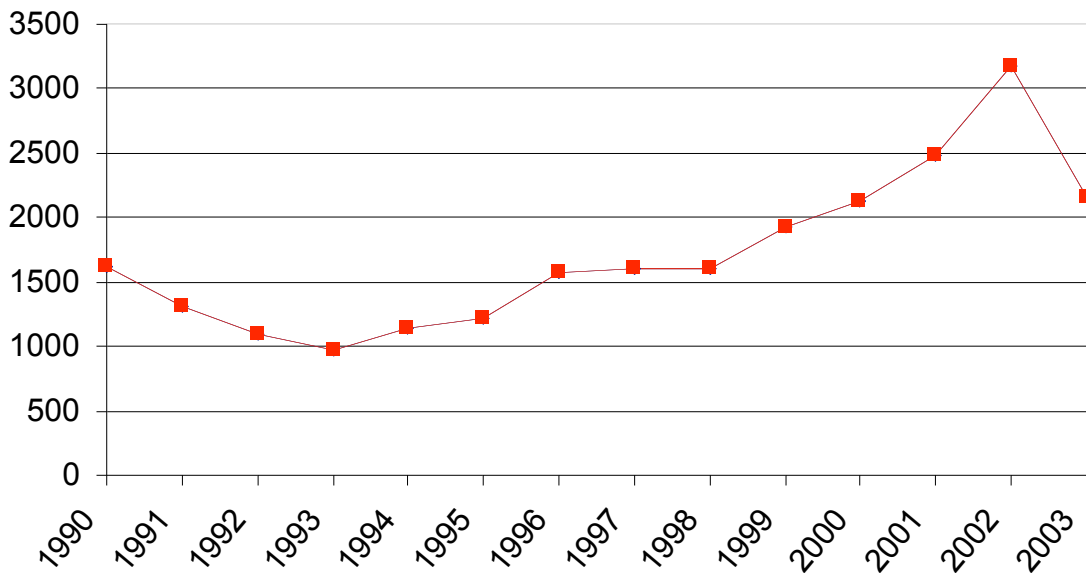
3. The Number of Apprentices

A total of 24,152 apprentices began a construction apprenticeship in Maryland from the beginning of 1990 to the end of 2003. Union programs enrolled the largest share of apprentices. During this period, 57.9 percent of apprentices were enrolled in a union group program, 38.4 percent were enrolled in a nonunion group employer program, and 3.7 percent were enrolled in a nonunion individual employer program. Because only a small percentage of apprentices were enrolled in single employer programs, we have combined the group and individual nonunion programs. [See Appendix 2 for details on apprentices by program type]



The number of construction apprentices grew from 1990 to 2003. In 2003, a total of 2,173 apprentices entered the program, a 16.5 percent increase from the 1,865 that entered in 1990. The largest number of apprentices entered in 2002 with 3,252 new apprentices, while the lowest number entered in 1993 with only 934 new apprentices. The decline in new apprentice entries in 1991, 1992, 1993 and 2003 indicates that the number of people entering an apprenticeship program is sensitive to the business cycles.

**CHART 2:
Construction Apprentices by Entry Year
1990-2003**



Year	Total Entered
90	1865
91	1354
92	1086
93	934
94	1135
95	1207
96	1583
97	1565
98	1601
99	1826
00	2050
01	2521
02	3252
03	2173

The increase in new apprentices from 1990 to 2003 occurred in union programs. The number of new apprentices in union programs increased by 65.2 percent; from 853 in 1990 to 1,409 in 2003. By comparison, the number of new apprentices in nonunion group programs decreased by 24.5 percent. As a result, by 2003 almost two in three of new apprentices (64.8%) were enrolled in union programs.

4. Demographic Composition of Apprentices

Males comprised the overwhelming majority of construction apprentices from 1990 to 2003. Only 617 women – or only 2.6 percent of all apprentices – entered a construction industry apprenticeship program. However, as shown in Table 1, union apprenticeship programs had a female enrollment of 3.6 percent, compared to the 1.1 percent female enrollment in nonunion programs.

TABLE 1
Male and Female Construction Apprentices
1990-2003

	Union Program	Nonunion Program
Men	13,477	10,057
Men	96.4%	98.9%
Women	507	110
Women	3.6%	1.1%

Note: Two apprentices did not report their gender.

Regarding minority participation, 24.4 percent of all construction apprentices were African American, and 5.3 percent were Latino. As seen in Table 2, union programs had higher minority participation rates than nonunion programs. In union programs, 30.2 percent of apprentices were African American and 5.8 percent were Latino. By comparison, in nonunion programs, 16.5 percent of apprentices were African American and 4.6 percent were Latino.

Because union programs enrolled both the largest share of apprentices and the largest share of minority apprentices, the majority of African American and Latino apprentices were enrolled in union programs. Of the 5,891 African American construction apprentices who entered a program between 1990 and 2003, 71.6 percent were enrolled in union programs. Of the 1,279 Latino apprentices who entered a construction program from 1990 to 2003, 63.8 percent were enrolled in union programs.

TABLE 2
Ethnicity and Race of Construction Apprentices
1990-2003

	Union Program	Nonunion Program
White	8,675	7,821
White	62.0%	76.9%
African Am.	4,217	1,674
African Am.	30.2%	16.5%
Latino	816	463
Latino	5.8%	4.6%
Other	276	211
Other	2.0%	2.1%

Note: “Other” includes apprentices who are Asian, Native Americans, others, and unidentified.

Slightly more than one in every ten construction apprentice who entered a program was a veteran. As shown in Table 3, there was no variation of the percent of veterans enrolled by program type.

TABLE 3
Veteran Status of Construction Apprentices
1990-2003

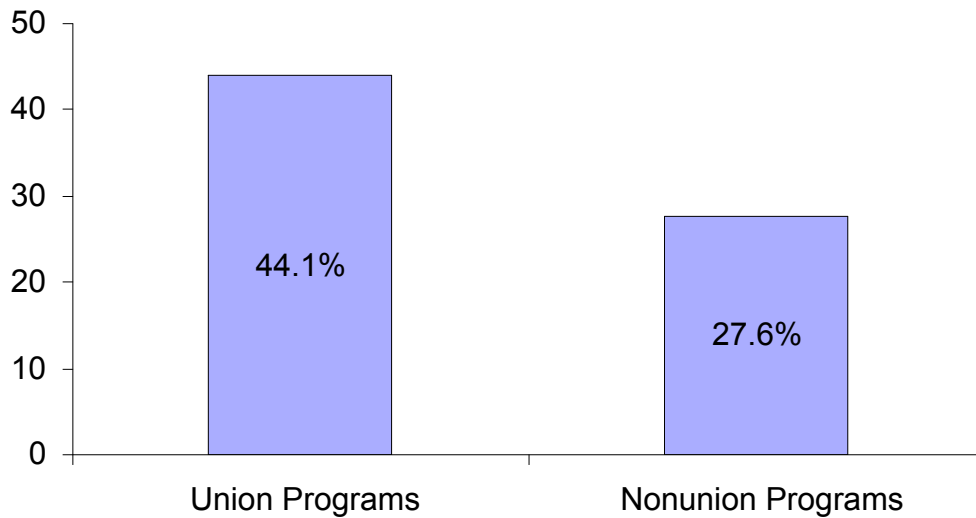
	Union Program	Nonunion Program
Non-veterans	12,539	9,115
Veterans	1,444	1,052
% Veterans	10.3%	10.3%

Note: Two apprentices did not report their veteran status.

5. Graduation Rates

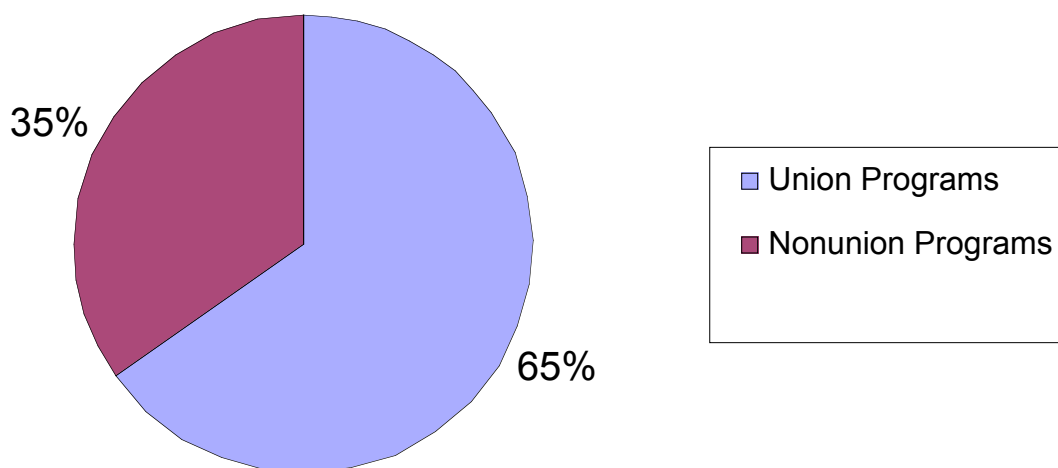
Of the 12,330 apprentices who entered an apprenticeship program in the construction industry between 1990 and 1998, 55.1 percent had cancelled, 36.3 percent had graduated, and 1.3 percent were still active by the end of 2003. The remaining apprentices had transferred to another program. As shown in Chart 4, the graduation rate differed significantly by program type. Union programs graduated 44.0 percent of their apprentices, compared to a graduation rate in nonunion programs of 27.6 percent. (see Appendix 3) The graduation rate is the number of apprentices who graduated out of the number of apprentices who had enrolled in the same period.

**CHART 3:
Graduation Rate by Program Type
1990-1998**



Because union programs enrolled the largest share of apprentices and had a higher graduation rate, union programs provided the largest share of apprentice graduates. Union programs graduated 2,865 apprentices in the study period, compared to 1,605 graduates from nonunion programs.

**CHART 4
Apprentices' Completions by Program Type
1990-1998**



5.1 Graduation Rate by Demographic Characteristics

Table 4 shows the graduation rate by demographic status and program type. In both types of programs, men had a higher graduation rate than women, and whites had a higher graduation rate than minorities. However, union programs outperformed nonunion programs in every demographic group. (See Appendix 4 for graduation rates of apprentices by employer sponsor type).

**TABLE 4:
Graduation Rates by Demographic Characteristics
1990-1998**

	Union Programs	Nonunion Programs
Total	44.0%	27.6%
Men	44.6%	27.8%
Women	25.9%	15.9%
White	50.4%	29.5%
African Am.	28.8%	19.8%
Latino	39.8%	16.6%

Given that female and minority apprentices were a small share of all apprentices, and their completion rates were lower, they comprised a small share of graduates. Only 69 women completed an apprenticeship program in the construction industry during the study period, or just 1.5 percent of all apprentice graduates—and 58 of these were from union sponsored programs. Moreover, only 103 Latinos completed an apprenticeship program in the construction industry, or just 2.3 percent of all apprentice graduates—and 76 were from union programs. Finally, 696 African American apprentices completed a program, comprising 15.6 percent of all apprentices who completed. Again, the majority of these apprentices – 527 African Americans – were in union programs.

5.2 Graduation by Occupation

Table 5 provides graduation rates by craft for the five largest construction occupations. Union programs graduated a higher percentage of apprentices than did nonunion programs in all but one of these crafts, including 55.7 percent of electricians versus 31.6 percent, 69.1 percent of steamfitters versus 36.4 percent, and 48.1 percent of plumbers versus 13.5 percent. Nonunion programs did graduate a slightly higher percentage of carpenters than did union programs, 34.2 percent versus 26.3 percent. However, nonunion programs graduated only 53 carpenters versus the 237 carpentry graduates from the union programs.

The small numbers of nonunion graduates in some occupations highlight the failure of these programs to provide training in a wide variety of crafts. Electricians comprised

69.9 percent of all nonunion apprentice graduates, versus only 27.7 percent in union programs.

**TABLE 5:
Graduation Rates by Occupation
1990 –1998**

	Union Programs			Nonunion Programs		
	Number enrolled	Number graduated	Graduation Rate (in %)	Number enrolled	Number graduated	Graduation Rate (in %)
Electrician	1425	794	55.7	3551	1122	31.6
Plumber	648	312	48.1	846	114	13.5
Carpenter	902	237	26.3	155	53	34.2
Steamfitter	991	685	69.1	11	4	36.4
Sheet metal worker	711	314	44.2	125	35	28.0
Other	1840	523	28.4	1125	277	24.6
Total	6517	2865	44.0	5813	1605	27.6

6. Conclusion

Union apprenticeship programs in Maryland graduate a significantly higher percentage of enrollees and serve a more diverse population than do nonunion programs. These findings are consistent with other studies of apprenticeship systems, including five studies of the state construction apprenticeship systems [Kentucky, Pennsylvania, Washington, West Virginia, and Indiana] and two nationwide studies.⁴

The Maryland findings and those of the other studies suggest the need for providing prospective participants information about the performance records of different apprenticeship programs. Currently, potential applicants in Maryland have little, if any, information about the past performance of specific apprenticeship programs and, therefore, have little information from which to make informed choices about which program to select. A simple requirement that apprenticeship programs make known the percentage of students who graduate might be a place to start.

There is also the danger that public resources are supporting apprenticeship programs with a poor track record in graduating trained workers. The recent trend in public education has been to hold schools to a greater degree of accountability based on specific

⁴ See Appendix 5.

measures of success.⁵ If this approach was extended to apprenticeship training, it might involve establishing a base graduation rate for programs, by different craft, in order to ensure those public resources are well used.

⁵ See the “No Child Left Behind” Act.

APPENDIX 1
List of Major Construction Sponsors

Group Joint:

Baltimore Carpenters, JATC, Local Union #101
Baltimore Electricians, JATC, Local Union #24
International Union of Elevator Constructors, Local Union #7, JAC
International Union of Elevator Constructors, Local Union #10, JAC
Iron Workers, Local Union #5, JATC
Joint Carpenters Apprenticeship Committee, Washington D.C.
Painters and Allied Trades District Council, Local Union #51
Plumbers and Steamfitters, Local Union #486, JATC
Sheet Metal Workers, Local Union #100, JAC, Washington D.C.
Steamfitters, Local Union #602, JATC
Washington D.C. Electricians, JATC, Local Union #26

Group Non-joint:

ACCA-Central MD Chapter
ABC, Baltimore Metropolitan Chapter
ABC, Chesapeake Chapter
ABC, Cumberland Valley Chapter
Harford County Electrical Contractors Association
Independent Electrical Contractors, Chesapeake

Individual Non-joint:

Delaware Elevator, Inc.
John W. Tieder, Inc.
Livingston Fire Protection, Inc.
WACO, Inc.

APPENDIX 2
Gender and Race Composition of Apprentices by Program Type, 1990-2003, in the Construction Industry, Maryland

	All	Union	Non-Union
Total	24,152	13,984	10,168
Men	23,534	13,477	10,057
Women	617	507	110
Whites	16,496	8,675	7,821
African Americans	5,891	4,217	1,674
Latinos	1,279	816	463
% men	97.4%	96.4%	98.9%
% women	2.6%	3.6%	1.1%
% whites	68.3%	62.0%	76.9%
% African Am.	24.4%	30.2%	16.5%
% Latinos	5.3%	5.8%	4.6%

Note: The gender of two apprentices was not available. The race category “other” was not included in the table, but accounts for the difference between the total in a group and the sum of white, African American and Latino apprentices.

APPENDIX 3
Graduation Rates of Apprentices, Who Entered an Apprenticeship Program in 1990-1998, by Demographic Characteristics and Program Type in the Construction Industry, Maryland

	All (in percent)	Union	Non-Union
Total	36.3	44.0	27.6
Men	36.6	44.6	27.8
Women	23.5	25.9	15.9
White	39.5	50.4	29.5
African Am.	25.9	28.8	19.8
Latino	29.1	39.8	16.6

APPENDIX 4:
Occupational Distribution of Apprentices, Who Entered an Apprenticeship Program in 1990-2003, in the Construction Industry, Maryland

Occupation	Number	Percent (%)
Electrician	9,001	37.3
Plumber	2,666	11.0
Carpenter	2,165	9.0
Steamfitter	1,847	7.6
Sheet metal worker	1,750	7.3
HVAC/R technician	1,186	4.9
Structural steel worker	981	4.1
Elevator constructor	755	3.1
Painter/decorator	675	2.8
Insulator worker	577	2.4
Operating engineer	451	1.9
Sprinkler fitter	387	1.6
Reinforcing ironworker	365	1.5
Bricklayer	313	1.3
Glazier	298	1.2
Drywall applicator and finisher	208	.86
Construction craft laborer	176	.73
Telecommunications installer	162	.67
Millwright	95	.39
Miscellaneous	94	.39
Total	24,152	100

Note: Miscellaneous includes: cabinetmaker, cement mason, marble mason, metal fabricator, pile driver, plasterer, roofer, stone mason, and tile setter.

APPENDIX 5
List of Apprenticeship Studies

Construction Apprenticeship and Training in Pennsylvania, by David Bradley and Stephen Herzenberg

Apprentice Training in Kentucky, a Comparison of Union and Non-Union Programs in the Building Trades, by William J. Londrigan and Joseph Wise, III

Building Trades Apprenticeship Training in West Virginia, A Comparison of Union and Non-Union Trades Programs in the 1990's, by Sara Etherton, Stephen Cook and Robert Massey, Jr.

Apprenticeship Utilization in Washington State Programs in the Building and Construction Trades, Washington State Construction and Building Trades Council

Analysis of Construction Industry Apprenticeship Programs in Indiana, Jeff Vincent, Indiana University Institute for the Study of Labor in Society

Apprenticeship Training in the U.S. Construction Industry, Cihan Bilginsoy, University of Utah, Department of Economics

The Status of Registered Apprenticeship: An Analysis Using Data from the Registered Apprenticeship Information System Frank J Bennici, Westat, prepared for the DOL Office of Apprenticeship Training, Employer and Labor Services