



Tucson, AZ Wages and Benefits Construction Industry Test Survey, May 1998

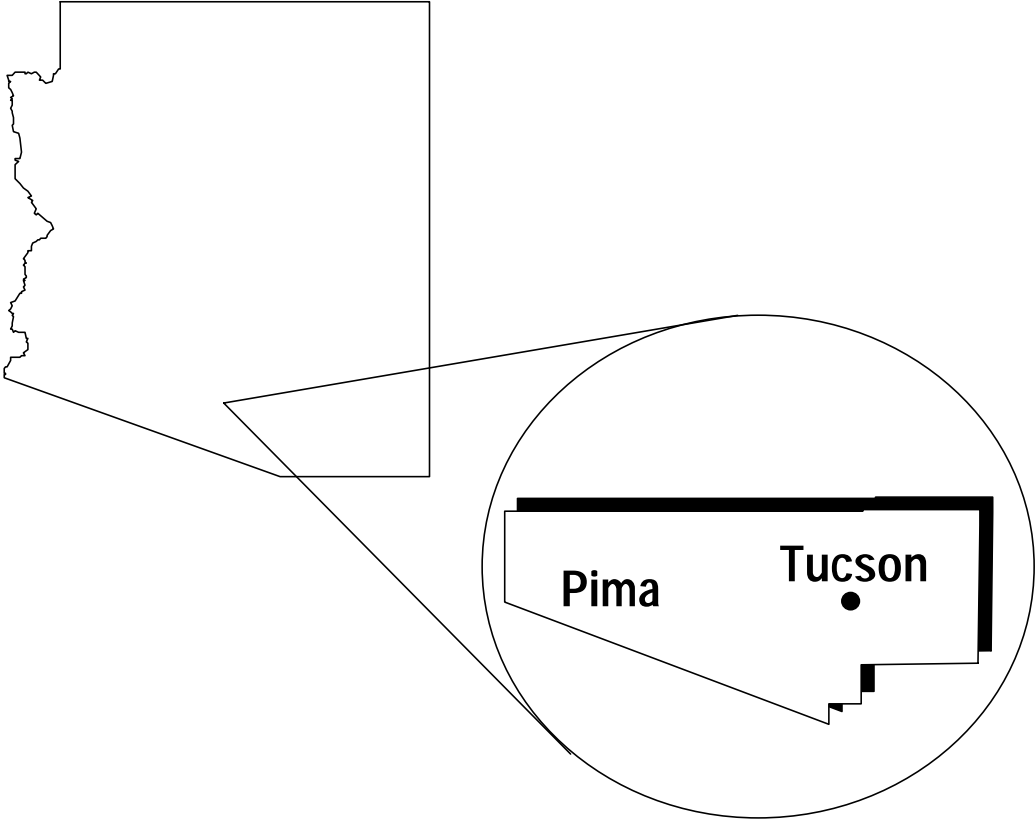
U.S. Department of Labor
Alexis M. Herman, Secretary

Bureau of Labor Statistics
Katharine G. Abraham, Commissioner

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Tucson, AZ
Metropolitan Statistical Area



Preface

This bulletin provides results of a May 1998 test survey of construction wages and benefits in the Tucson, AZ, Metropolitan Statistical Area (MSA). This test was conducted by the Bureau of Labor Statistics (BLS) at the request of the Employment Standards Administration, U. S. Department of Labor.

The survey could not have been conducted without the cooperation of the many private firms that provided wage and benefit data included in this bulletin. The Bureau thanks these respondents for their cooperation.

Survey data were collected and reviewed by Bureau of Labor Statistics field economists. The Office of Compensation and Working Conditions, in cooperation with the Office of Field Operations and the Office of Technology and Survey Processing in the BLS National Office, designed the survey, processed the data, and analyzed the survey results.

For additional information regarding this survey, please contact the BLS San Francisco Regional Office at (415) 975-4350. You may also write to the Bureau of Labor Statistics at: Division of Compensation Data Analysis and Planning, 2 Massachusetts Avenue, NE, Room 4175, Washington, DC 20212-0001, or call (202) 606-6220, or you may contact us by e-mail (ocltinfo@bls.gov). The data contained in this bulletin are also available at the BLS Internet site (<http://stats.bls.gov/comhome.htm>).

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Contents

	<i>Page</i>
Introduction.....	1
Wages and benefits in construction industries, Tucson, AZ, MSA	2
Tables:	
1. Hourly earnings for blue-collar occupations, all workers, construction industries	4
2. Hourly earnings for blue-collar occupations, union and nonunion workers, construction industries.....	5
3. Hourly earnings for blue-collar occupations, all workers, by construction industries	6
4. Paid holidays: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	7
5. Paid vacations: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	8
6. Paid sick leave: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	9
7. Life insurance: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	10
8. Health insurance: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	11
9. Short-term disability benefits: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	12
10. Long-term disability benefits: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	13
11. Defined benefit retirement: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	14
12. Defined contribution retirement: Access, participation, and employer costs for blue-collar occupations, all workers, construction industries	15
13. Number of blue-collar workers, by occupational group and construction industries.....	16
Appendixes:	
A. Technical Note.....	17
Appendix table 1. Establishments and workers within scope of survey and number sampled.....	22
B. Occupational Classifications.....	23

Introduction

This test survey of wages and benefits in the construction industry was conducted in the Tucson, AZ, Metropolitan Statistical Area (MSA). The MSA includes Pima County, AZ.

The Bureau of Labor Statistics (BLS) and the Employment Standards Administration (ESA), agencies of the U. S. Department of Labor, are testing the feasibility of publishing wage and salary data and benefit cost and incidence data for blue-collar construction occupations in the construction industries. This test will assist ESA in determining prevailing wages and benefits for construction workers employed on federally funded projects within specific areas.

The Davis Bacon Act and related acts require contractors and subcontractors performing work on federally financed or assisted construction projects to pay employees the prevailing wage rates and benefits for the area. The Act applies to all construction contracts over \$2,000 with the United States or the District of Columbia. The Act also stipulates that a continuing program for obtaining and compiling wage rate and benefit information be established.

Wage and benefit tabulations

This bulletin consists primarily of wage and benefit tables whose data are analyzed in the initial textual section. Tabulations provide information on specific blue-collar occupations within four major occupational groups: precision production, craft, and repair occupations; machine operators, assemblers, and inspectors; transportation and material

moving occupations; and handlers, equipment cleaners, helpers, and laborers.

Hourly earnings are presented for all workers, union and nonunion workers, and workers within specific construction industries. The benefit tables provide detailed information on access, participation, and employer costs per participant for a number of benefits. Benefits covered by this survey include holidays, vacations, sick leave, life insurance, health insurance, short-term and long-term disability, and retirement. Also contained in this bulletin is information on the number of establishments and the number of blue-collar workers engaging in construction activities within the survey area. A technical note describing survey procedures is also included.

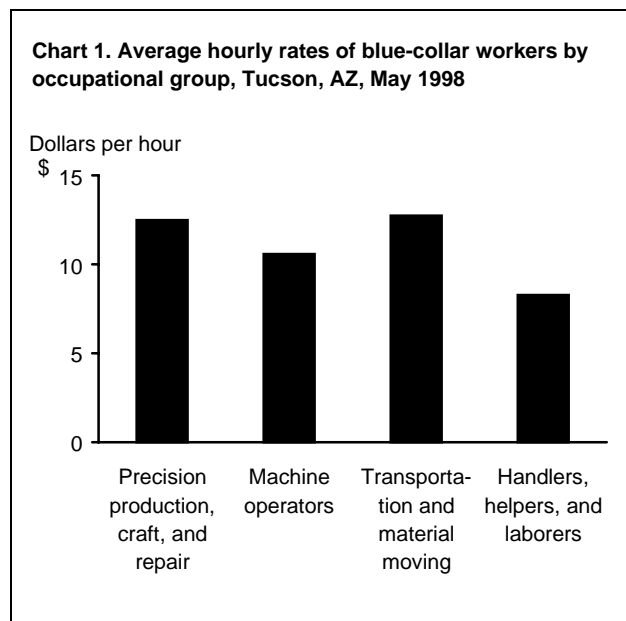
Survey coverage

This survey covers construction establishments in the private sector that employ one or more workers. Data were collected from a sample of establishments selected from all establishments within the survey area. Occupations within each sample establishment were then selected from a list of the blue-collar workers using probability proportional to size techniques. During processing, wage and benefit data were weighted to represent all private construction establishments in the survey area. Four construction test surveys are currently planned for collection during 1998 and 1999: Jacksonville, FL, Tucson, AZ, Salt Lake City-Ogden, UT, and Toledo, OH.

Wages and Benefits in Construction Industries, Tucson, AZ, Metropolitan Statistical Area

Straight-time wages for blue-collar workers in construction industries in the Tucson, AZ, Metropolitan Statistical Area averaged \$11.18 per hour during May 1998. The major occupational group titled precision production, craft, and repair occupations had an average rate of \$12.49 per hour. Machine operators, assemblers, and inspectors were at \$10.58 while transportation and material moving occupations averaged \$12.73 per hour. The average hourly rate for handlers, equipment cleaners, helpers, and laborers was \$8.27. (See chart 1.)

Within precision production, craft, and repair occupations, wages for workers in construction trades occupations averaged \$11.79 per hour, supervisors of construction trades occupations were at \$16.06 per hour, while wages for other precision production, craft, and repair occupations averaged \$12.19 per hour.

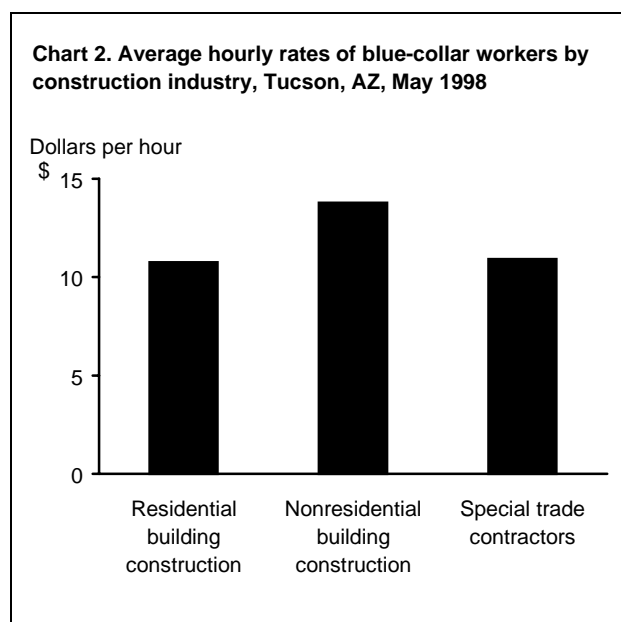


Within occupational groups, straight-time wages for individual occupations varied. For example, carpenters averaged \$11.23, drywall installers \$11.71, and plumbers, pipefitters, and steamfitters \$13.54. Average hourly wages for other populous jobs include painters (construction and maintenance) at \$10.20, concrete and terrazzo finishers at \$11.58, helpers (construction trades) at \$7.66, and construction laborers at \$8.65. Table 1 presents earnings data

for 29 detailed blue-collar occupations; data for other detailed occupations surveyed could not be reported separately due to concerns about the confidentiality of survey respondents and the reliability of the data.

Surveyed occupations were classified as union or non-union occupations. Approximately 95 percent of workers were non-union. Table 2 presents occupational wage data by union/nonunion status; union data for most individual occupations did not meet publication criteria. Union wages for all blue-collar occupations averaged \$14.80 per hour, while nonunion wages averaged \$10.98.

Table 3 presents wage data by type of construction activity, such as residential building construction or highway and street construction. Special trade contractors employed the majority of workers, including contractors specializing in carpentry work, drywall installation, electrical work, and plumbing, heating, and air-conditioning work. Chart 2 illustrates the average hourly rates for residential building construction, nonresidential building construction, and special trade contractors.

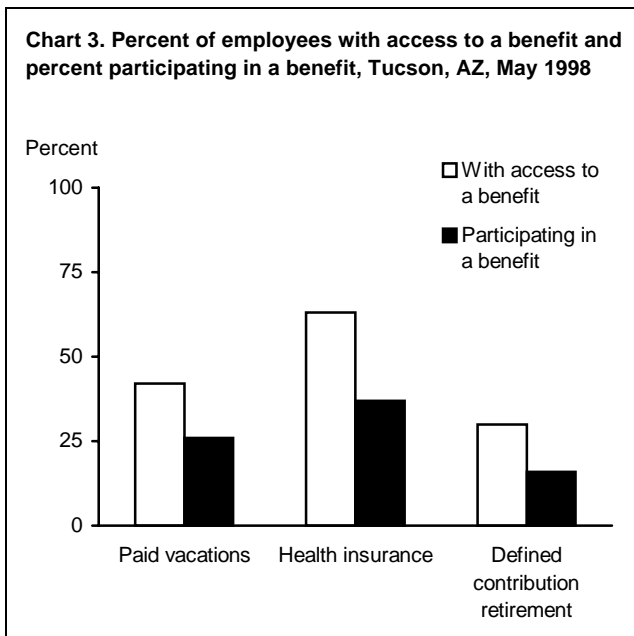


Data on the access, participation, and employer costs for various benefits are reported in tables 4 through 12. The survey studied paid leave (e.g., paid holidays, vacations, and sick leave), insurances (e.g., life, health, short-

term disability, and long-term disability), and retirement benefits (both defined benefit and defined contribution plans). Benefit information is presented by major occupational group and by individual occupation.

For each specific benefit, the tables show the percent of employees having access to the benefit and the percent actually participating in the benefit. Those defined as having access currently have a benefit plan or will eventually be eligible for a benefit plan. Employees may not be participating in a benefit because of a service requirement; for example, a new employee may have to wait 1 year to receive a paid vacation. Also, an employee may decline to participate in a plan such as health insurance because of a contribution requirement.

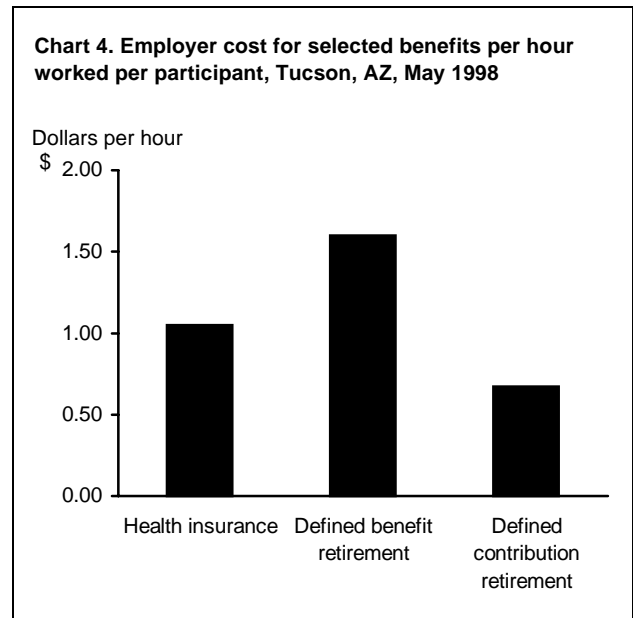
Chart 3 shows the proportion of employees with access to a specific benefit and the proportion participating in the benefit.



The employer cost for each benefit, per hour worked, per participant, is also provided in tables 4 through 12. The cost per hour worked was determined by converting benefit data to an annual cost and then dividing by the annual hours worked. Chart 4 illustrates the employer costs per hour worked per participant for health insurance, de-

defined benefit retirement, and defined contribution retirement. Participation in these benefits varied widely. The number of employees participating in health insurance (37 percent) was much higher than those participating in either a defined benefit retirement plan (5 percent) or a defined contribution retirement plan (16 percent).

Defined benefit retirement plans provide employees with a specified retirement benefit; defined contribution retirement plans provide retirement benefits that are a function of contributions and investments. See appendix A for more detailed definitions on these and other surveyed benefits.



The number of blue-collar workers in construction industries is presented in table 13. Of the total of 12,712 workers, nearly half were in specific construction trades occupations. These included 1,125 carpenters and 903 drywall installers. Supervisors of construction trades occupations totaled 1,179 workers. Survey results show 1,446 helpers (construction trades) and 2,153 construction laborers.

In this survey of the Tucson, AZ, construction industry, a sample of 450 establishments employing 10,253 workers was selected. This sample represented a total of 1,660 construction establishments and 15,104 workers within scope of the survey. The worker total includes all white-collar, blue-collar, and service workers.

Table 1. Hourly earnings¹ for blue-collar occupations, all workers, construction industries,² Tucson, AZ, May 1998

Occupation ³	Mean	Percentiles				
		10	25	50	75	90
All blue-collar occupations	\$11.18	\$7.00	\$8.25	\$11.00	\$13.00	\$16.13
Precision production, craft, and repair occupations	12.49	8.50	10.00	12.00	14.04	17.31
Construction trades occupations	11.79	8.50	10.00	11.52	13.00	16.00
Brickmasons and stonemasons	11.96	8.00	10.00	12.00	13.50	15.50
Tile setters, hard and soft	13.16	—	—	—	—	—
Carpenters	11.23	8.00	9.00	11.00	12.60	15.16
Drywall installers	11.71	9.00	10.50	12.00	12.50	13.00
Electricians	13.85	10.00	12.00	13.50	16.00	17.50
Electrician apprentices	9.81	—	—	—	—	—
Painters, construction and maintenance	10.20	7.00	8.00	10.00	11.50	14.00
Plasterers	10.91	8.00	10.00	11.00	12.00	13.00
Plumbers, pipefitters, and steamfitters	13.54	11.00	12.00	12.50	15.00	17.75
Concrete and terrazzo finishers	11.58	9.50	10.00	11.00	12.00	14.00
Roofers	10.05	7.75	9.00	10.00	11.00	12.00
Sheetmetal duct installers	11.00	8.00	8.50	10.00	13.00	17.42
Structural metal workers	15.39	—	—	—	—	—
Construction trades, N.E.C.	12.20	8.50	9.00	11.00	15.00	18.00
Supervisors, construction trades	16.06	11.50	13.00	15.00	18.32	22.51
Supervisors; brickmasons, stonemasons, and tilesetters	13.36	—	—	—	—	—
Supervisors; carpenters and related workers ...	16.70	—	—	—	—	—
Supervisors; electricians and power transmission installers	20.05	—	—	—	—	—
Supervisors; painters, paperhangers, and plasterers	14.95	—	—	—	—	—
Supervisors; plumbers, pipefitters, and steamfitters	16.64	—	—	—	—	—
Supervisors; construction trades, N.E.C.	15.88	11.47	13.00	15.00	18.32	22.51
Other precision production, craft, and repair occupations	12.19	8.10	9.50	11.50	14.25	18.00
Electronic repairers, communications and industrial equipment	12.19	—	—	—	—	—
Heating, air conditioning, and refrigeration mechanics	12.16	8.25	9.75	12.00	14.00	17.00
Machine operators, assemblers, and inspectors	10.58	8.00	9.00	10.00	12.00	14.00
Welders and cutters	9.90	8.00	8.50	9.50	11.00	12.00
Transportation and material moving occupations	12.73	10.00	11.00	12.24	14.50	16.30
Truck drivers	10.67	8.00	9.50	10.82	12.24	12.49
Excavating and loading machine operators	12.24	10.00	12.00	12.00	12.50	14.75
Grader, dozer, and scraper operators	14.88	12.50	13.50	15.00	16.00	17.60
Handlers, equipment cleaners, helpers, and laborers	8.27	6.00	6.50	7.75	9.00	11.00
Helpers, mechanics and repairers	8.22	—	—	—	—	—
Helpers, construction trades	7.66	6.00	6.50	7.50	8.50	10.00
Construction laborers	8.65	6.00	7.00	8.00	9.50	13.00

¹ Earnings are the straight-time hourly wages or salaries paid to employees. They include incentive pay, cost-of-living adjustments, and hazard pay. Excluded are premium pay for overtime, vacations, holidays, nonproduction bonuses, on-call pay, and tips. The mean is computed by totaling the pay of all workers and dividing by the number of workers, weighted by hours. The 10th, 25th, 50th, 75th, and 90th percentiles designate position in the earnings distribution. At the 50th percentile, the median, half of the workers receive the same as or more and half receive the same as or less than the rate shown. At the 25th percentile, one-fourth of workers earn the same as or less than the rate shown. At the 75th percentile, one-fourth earn the same as or more than the rate shown. The 10th and 90th percentiles follow the same logic.

² The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

³ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. N.E.C. means "not elsewhere classified."

Table 2. Hourly earnings¹ for blue-collar occupations, union and nonunion workers,² construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Union						Nonunion					
	Mean	Percentiles					Mean	Percentiles				
		10	25	50	75	90		10	25	50	75	90
All blue-collar occupations	\$14.80	\$8.56	\$12.03	\$16.13	\$17.42	\$18.55	\$10.98	\$7.00	\$8.00	\$10.50	\$13.00	\$15.63
Precision production, craft, and repair occupations	15.91	10.34	14.18	16.50	17.82	20.00	12.29	8.50	10.00	12.00	14.00	16.54
Construction trades occupations	15.73	10.40	13.60	16.50	17.60	20.00	11.58	8.45	10.00	11.50	13.00	15.16
Brickmasons and stonemasons	-	-	-	-	-	-	11.96	8.00	10.00	12.00	13.50	15.50
Tile setters, hard and soft	-	-	-	-	-	-	13.16	-	-	-	-	-
Carpenters	-	-	-	-	-	-	11.16	8.00	9.00	11.00	12.00	15.49
Drywall installers	-	-	-	-	-	-	11.71	9.00	10.50	12.00	12.50	13.00
Electricians	16.49	-	-	-	-	-	13.17	9.50	11.00	13.00	14.55	17.00
Painters, construction and maintenance	-	-	-	-	-	-	10.20	7.00	8.00	10.00	11.50	14.00
Plasterers	-	-	-	-	-	-	10.91	8.00	10.00	11.00	12.00	13.00
Plumbers, pipefitters, and steamfitters	-	-	-	-	-	-	12.99	10.76	12.00	12.50	14.00	16.00
Concrete and terrazzo finishers	-	-	-	-	-	-	11.58	9.50	10.00	11.00	12.00	14.00
Roofers	-	-	-	-	-	-	10.05	7.75	9.00	10.00	11.00	12.00
Sheetmetal duct installers	-	-	-	-	-	-	10.13	8.00	8.00	10.00	12.00	13.00
Construction trades, N.E.C.	-	-	-	-	-	-	12.20	8.50	9.00	11.00	15.00	18.00
Supervisors, construction trades	-	-	-	-	-	-	15.97	11.50	13.00	15.00	18.32	22.75
Supervisors; brickmasons, stonemasons, and tilesetters	-	-	-	-	-	-	13.36	-	-	-	-	-
Supervisors; carpenters and related workers	-	-	-	-	-	-	16.70	-	-	-	-	-
Supervisors; painters, paperhangers, and plasterers	-	-	-	-	-	-	14.95	-	-	-	-	-
Supervisors; plumbers, pipefitters, and steamfitters	-	-	-	-	-	-	16.64	-	-	-	-	-
Supervisors; construction trades, N.E.C.	-	-	-	-	-	-	15.87	11.47	13.00	15.00	18.32	22.75
Other precision production, craft, and repair occupations	-	-	-	-	-	-	11.88	8.00	9.50	11.00	14.00	17.00
Electronic repairers, communications and industrial equipment	-	-	-	-	-	-	12.19	-	-	-	-	-
Heating, air conditioning, and refrigeration mechanics	-	-	-	-	-	-	11.71	8.25	9.50	11.50	14.00	16.00
Machine operators, assemblers, and inspectors	-	-	-	-	-	-	10.58	8.00	9.00	10.00	12.00	14.00
Welders and cutters	-	-	-	-	-	-	9.90	8.00	8.50	9.50	11.00	12.00
Transportation and material moving occupations	-	-	-	-	-	-	12.70	10.00	11.00	12.24	14.50	16.00
Truck drivers	-	-	-	-	-	-	10.66	8.00	9.50	10.82	12.24	12.49
Excavating and loading machine operators ..	-	-	-	-	-	-	12.24	10.00	12.00	12.00	12.50	14.75
Grader, dozer, and scraper operators	-	-	-	-	-	-	14.88	12.50	13.50	15.00	16.00	17.60
Handlers, equipment cleaners, helpers, and laborers	12.72	-	-	-	-	-	8.02	6.00	6.50	7.50	9.00	10.29
Helpers, mechanics and repairers	-	-	-	-	-	-	7.96	-	-	-	-	-
Helpers, construction trades	-	-	-	-	-	-	7.57	6.00	6.50	7.25	8.50	9.50
Construction laborers	-	-	-	-	-	-	8.24	6.00	6.75	8.00	9.00	11.00

¹ Earnings are the straight-time hourly wages or salaries paid to employees. They include incentive pay, cost-of-living adjustments, and hazard pay. Excluded are premium pay for overtime, vacations, holidays, nonproduction bonuses, on-call pay, and tips. The mean is computed by totaling the pay of all workers and dividing by the number of workers, weighted by hours. The 10th, 25th, 50th, 75th, and 90th percentiles designate position in the earnings distribution. At the 50th percentile, the median, half of the workers receive the same as or more and half receive the same as or less than the rate shown. At the 25th percentile, one-fourth of workers earn the same as or less than the rate shown. At the 75th percentile, one-fourth earn the same as or more than the rate shown. The 10th and 90th percentiles follow the same logic.

² Union workers are those whose wages are determined through collective bargaining.
³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. N.E.C. means "not elsewhere classified."

Table 3. Hourly earnings¹ for blue-collar occupations, all workers, by construction industries,² Tucson, AZ, May 1998

Occupation ³	All construction		Residential building construction		Nonresidential building construction		Highway and street construction		Heavy construction, except highway		Special trade contractors	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All blue-collar occupations	\$11.18	\$11.00	\$10.75	\$10.00	\$13.78	\$12.50	\$12.56	\$12.00	\$11.67	\$12.00	\$10.91	\$10.50
Precision production, craft, and repair occupations	12.49	12.00	13.19	12.00	15.74	14.00	15.95	16.54	13.47	12.50	12.10	12.00
Construction trades occupations	11.79	11.52	11.72	11.31	12.74	12.00	14.54	15.00	10.76	12.00	11.70	11.50
Brickmasons and stonemasons	11.96	12.00	-	-	-	-	-	-	-	-	12.26	12.00
Tile setters, hard and soft	13.16	-	-	-	-	-	-	-	-	-	13.16	-
Carpenters	11.23	11.00	11.73	12.00	13.75	14.00	-	-	-	-	10.69	10.00
Drywall installers	11.71	12.00	-	-	-	-	-	-	-	-	11.71	12.00
Electricians	13.85	13.50	-	-	-	-	-	-	-	-	13.92	13.50
Electrician apprentices	9.81	-	-	-	-	-	-	-	-	-	9.18	-
Painters, construction and maintenance	10.20	10.00	-	-	-	-	-	-	-	-	10.10	9.75
Plasterers	10.91	11.00	-	-	-	-	-	-	-	-	11.17	11.00
Plumbers, pipefitters, and steamfitters	13.54	12.50	-	-	-	-	-	-	-	-	13.57	12.75
Concrete and terrazzo finishers	11.58	11.00	-	-	-	-	-	-	-	-	11.42	11.00
Roofers	10.05	10.00	-	-	-	-	-	-	-	-	10.05	10.00
Sheetmetal duct installers	11.00	10.00	-	-	-	-	-	-	-	-	10.96	10.00
Structural metal workers	15.39	-	-	-	-	-	-	-	-	-	-	-
Construction trades, N.E.C.	12.20	11.00	13.14	-	-	-	-	-	10.05	-	12.50	11.00
Supervisors, construction trades	16.06	15.00	17.62	16.83	20.42	21.25	-	-	16.32	-	14.85	14.00
Supervisors; brickmasons, stonemasons, and tilesetters	13.36	-	-	-	-	-	-	-	-	-	13.21	-
Supervisors; carpenters and related workers	16.70	-	-	-	-	-	-	-	-	-	-	-
Supervisors; electricians and power transmission installers	20.05	-	-	-	-	-	-	-	-	-	20.05	-
Supervisors; painters, paperhangers, and plasterers	14.95	-	-	-	-	-	-	-	-	-	12.74	-
Supervisors; plumbers, pipefitters, and steamfitters	16.64	-	-	-	-	-	-	-	-	-	-	-
Supervisors; construction trades, N.E.C.	15.88	15.00	16.46	-	21.43	-	-	-	-	-	13.73	13.50
Other precision production, craft, and repair occupations	12.19	11.50	-	-	-	-	-	-	-	-	11.77	11.00
Electronic repairers, communications and industrial equipment	12.19	-	-	-	-	-	-	-	-	-	12.19	-
Heating, air conditioning, and refrigeration mechanics	12.16	12.00	-	-	-	-	-	-	-	-	12.16	12.00
Machine operators, assemblers, and inspectors	10.58	10.00	-	-	-	-	-	-	-	-	10.54	10.00
Welders and cutters	9.90	9.50	-	-	-	-	-	-	-	-	9.81	-
Transportation and material moving occupations	12.73	12.24	-	-	-	-	11.35	11.00	13.22	12.50	-	-
Truck drivers	10.67	10.82	-	-	-	-	10.81	-	-	-	10.55	-
Excavating and loading machine operators ..	12.24	12.00	-	-	-	-	-	-	12.68	12.50	-	-
Grader, dozer, and scraper operators	14.88	15.00	-	-	-	-	-	-	-	-	-	-
Handlers, equipment cleaners, helpers, and laborers	8.27	7.75	8.04	7.75	8.74	8.00	9.67	10.00	10.49	8.50	7.77	7.50
Helpers, mechanics and repairers	8.22	-	-	-	-	-	-	-	-	-	8.22	-
Helpers, construction trades	7.66	7.50	7.30	-	-	-	-	-	-	-	7.50	7.00
Construction laborers	8.65	8.00	8.41	8.50	8.54	8.00	9.24	-	11.35	10.00	7.82	7.50

¹ Earnings are the straight-time hourly wages or salaries paid to employees. They include incentive pay, cost-of-living adjustments, and hazard pay. Excluded are premium pay for overtime, vacations, holidays, nonproduction bonuses, on-call pay, and tips. The mean is computed by totaling the pay of all workers and dividing by the number of workers, weighted by hours. At the 50th percentile, the median, half of the workers receive the same as or more and half receive the same as or less than the rate shown.

² The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

³ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. N.E.C. means "not elsewhere classified."

Table 4. Paid holidays:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	30	69	1	29	95	\$0.26
Precision production, craft, and repair occupations	34	65	1	32	95	0.29
Construction trades occupations	28	71	1	27	94	0.24
Brickmasons and stonemasons	9	91	—	9	—	—
Tile setters, hard and soft	12	88	—	12	—	—
Carpenters	20	80	—	19	95	0.17
Drywall installers	2	98	—	2	—	—
Electricians	40	60	—	39	99	0.32
Electrician apprentices	31	69	—	31	—	—
Painters, construction and maintenance	35	65	—	34	97	0.22
Plasterers	5	87	8	5	—	—
Plumbers, pipefitters, and steamfitters	77	22	1	69	90	0.27
Concrete and terrazzo finishers	9	87	4	9	—	—
Roofers	47	53	—	41	—	—
Sheetmetal duct installers	40	59	2	39	—	—
Structural metal workers	72	28	—	72	—	—
Construction trades, N.E.C.	46	54	—	46	100	0.24
Supervisors, construction trades	47	51	2	45	96	0.47
Supervisors; brickmasons, stonemasons, and tilesetters	36	64	—	36	—	—
Supervisors; carpenters and related workers ...	33	67	—	33	—	—
Supervisors; electricians and power transmission installers	11	89	—	11	—	—
Supervisors; painters, paperhangers, and plasterers	8	71	22	8	—	—
Supervisors; plumbers, pipefitters, and steamfitters	89	11	—	89	100	0.46
Supervisors; construction trades, N.E.C.	54	46	—	51	94	0.49
Other precision production, craft, and repair occupations	64	32	4	62	97	0.26
Electronic repairers, communications and industrial equipment	73	27	—	73	100	0.30
Heating, air conditioning, and refrigeration mechanics	87	9	4	83	95	0.27
Machine operators, assemblers, and inspectors	77	20	3	67	86	0.28
Welders and cutters	65	31	4	51	80	0.23
Transportation and material moving occupations	9	91	—	9	100	0.26
Truck drivers	14	86	—	14	—	—
Excavating and loading machine operators	7	93	—	7	100	0.25
Grader, dozer, and scraper operators	—	100	—	—	—	—
Handlers, equipment cleaners, helpers, and laborers	26	72	2	25	95	0.16
Helpers, mechanics and repairers	38	62	—	35	—	—
Helpers, construction trades	34	66	—	33	97	0.15
Construction laborers	20	77	2	19	93	0.16

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 5. Paid vacations:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	42	56	2	26	62	\$0.34
Precision production, craft, and repair occupations	46	52	2	33	71	0.38
Construction trades occupations	40	59	1	26	65	0.33
Brickmasons and stonemasons	16	84	—	9	—	—
Tile setters, hard and soft	33	67	—	23	—	—
Carpenters	42	58	—	25	59	0.28
Drywall installers	1	99	—	1	—	—
Electricians	51	49	—	30	60	0.34
Electrician apprentices	53	47	—	16	—	—
Painters, construction and maintenance	36	64	—	25	70	0.30
Plasterers	12	80	8	5	—	—
Plumbers, pipefitters, and steamfitters	80	19	1	62	77	0.36
Concrete and terrazzo finishers	47	48	4	23	49	0.37
Roofers	41	59	—	33	82	0.18
Sheetmetal duct installers	51	47	2	33	65	0.31
Structural metal workers	60	12	28	51	—	—
Construction trades, N.E.C.	58	42	—	36	62	0.38
Supervisors, construction trades	60	38	2	52	87	0.51
Supervisors; brickmasons, stonemasons, and tilesetters	54	46	—	51	—	—
Supervisors; carpenters and related workers ...	60	40	—	46	78	—
Supervisors; electricians and power transmission installers	56	44	—	52	—	—
Supervisors; painters, paperhangers, and plasterers	—	78	22	—	—	—
Supervisors; plumbers, pipefitters, and steamfitters	89	11	—	89	100	0.66
Supervisors; construction trades, N.E.C.	66	34	—	56	85	0.52
Other precision production, craft, and repair occupations	80	16	4	64	80	0.36
Electronic repairers, communications and industrial equipment	73	27	—	69	94	0.37
Heating, air conditioning, and refrigeration mechanics	90	6	4	65	72	0.37
Machine operators, assemblers, and inspectors	41	48	11	27	67	—
Welders and cutters	65	18	17	43	67	—
Transportation and material moving occupations	44	56	—	14	—	—
Truck drivers	22	78	—	16	75	—
Excavating and loading machine operators	54	46	—	11	—	—
Grader, dozer, and scraper operators	56	44	—	15	—	—
Handlers, equipment cleaners, helpers, and laborers	34	65	2	16	48	0.21
Helpers, mechanics and repairers	47	53	—	24	—	—
Helpers, construction trades	42	58	—	18	43	0.17
Construction laborers	27	70	3	13	50	0.20

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 6. Paid sick leave:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	8	91	1	6	85	\$0.21
Precision production, craft, and repair occupations	10	89	1	8	87	0.24
Construction trades occupations	6	94	1	5	92	0.24
Brickmasons and stonemasons	—	100	—	—	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	3	97	—	3	—	—
Drywall installers	—	100	—	—	—	—
Electricians	10	90	—	10	—	—
Electrician apprentices	13	87	—	13	—	—
Painters, construction and maintenance	6	94	—	6	—	—
Plasterers	—	92	8	—	—	—
Plumbers, pipefitters, and steamfitters	13	87	—	9	73	0.16
Concrete and terrazzo finishers	—	96	4	—	—	—
Roofers	—	100	—	—	—	—
Sheetmetal duct installers	4	96	—	4	—	—
Structural metal workers	54	46	—	54	—	—
Construction trades, N.E.C.	13	87	—	13	—	—
Supervisors, construction trades	28	70	2	22	80	0.26
Supervisors; brickmasons, stonemasons, and tilesetters	30	70	—	30	—	—
Supervisors; carpenters and related workers ...	28	72	—	—	—	—
Supervisors; electricians and power transmission installers	8	92	—	8	—	—
Supervisors; painters, paperhangers, and plasterers	8	71	22	8	—	—
Supervisors; plumbers, pipefitters, and steamfitters	14	86	—	14	—	—
Supervisors; construction trades, N.E.C.	35	65	—	29	83	0.23
Other precision production, craft, and repair occupations	12	84	4	12	100	0.12
Electronic repairers, communications and industrial equipment	26	74	—	26	—	—
Heating, air conditioning, and refrigeration mechanics	14	82	4	14	—	—
Machine operators, assemblers, and inspectors	24	76	—	8	—	—
Welders and cutters	38	62	—	13	—	—
Transportation and material moving occupations	4	96	—	4	—	—
Truck drivers	6	94	—	6	—	—
Excavating and loading machine operators	1	99	—	1	—	—
Grader, dozer, and scraper operators	3	97	—	3	—	—
Handlers, equipment cleaners, helpers, and laborers	4	95	1	3	80	0.08
Helpers, mechanics and repairers	11	89	—	11	—	—
Helpers, construction trades	5	95	—	4	76	—
Construction laborers	3	95	2	2	93	—

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 7. Life insurance:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	28	68	4	20	70	\$0.04
Precision production, craft, and repair occupations	27	71	2	19	69	0.05
Construction trades occupations	26	72	2	17	66	0.05
Brickmasons and stonemasons	11	89	—	5	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	32	68	—	20	64	0.05
Drywall installers	19	81	—	10	—	—
Electricians	47	53	—	37	78	0.05
Electrician apprentices	82	18	—	68	84	0.03
Painters, construction and maintenance	15	85	—	9	—	—
Plasterers	49	43	8	7	—	—
Plumbers, pipefitters, and steamfitters	22	77	1	17	—	—
Concrete and terrazzo finishers	19	67	15	16	—	—
Roofers	—	100	—	—	—	—
Sheetmetal duct installers	2	96	2	2	—	—
Structural metal workers	68	18	14	68	—	—
Construction trades, N.E.C.	17	76	7	8	50	—
Supervisors, construction trades	36	60	3	28	78	0.06
Supervisors; brickmasons, stonemasons, and tilesetters	14	86	—	14	—	—
Supervisors; carpenters and related workers ...	40	60	—	15	—	—
Supervisors; electricians and power transmission installers	67	33	—	63	—	—
Supervisors; painters, paperhangers, and plasterers	36	42	22	19	—	—
Supervisors; plumbers, pipefitters, and steamfitters	8	92	—	8	—	—
Supervisors; construction trades, N.E.C.	38	59	3	31	81	0.06
Other precision production, craft, and repair occupations	20	76	4	15	75	0.03
Electronic repairers, communications and industrial equipment	—	100	—	—	—	—
Heating, air conditioning, and refrigeration mechanics	13	83	4	5	—	—
Machine operators, assemblers, and inspectors	52	37	11	39	—	—
Welders and cutters	25	58	17	11	—	—
Transportation and material moving occupations	65	35	—	59	90	0.03
Truck drivers	64	36	—	56	88	0.03
Excavating and loading machine operators	60	40	—	53	—	—
Grader, dozer, and scraper operators	73	27	—	68	—	—
Handlers, equipment cleaners, helpers, and laborers	21	73	6	12	58	0.04
Helpers, mechanics and repairers	37	63	—	19	—	—
Helpers, construction trades	22	78	—	12	55	0.05
Construction laborers	21	68	11	13	59	0.03

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 8. Health insurance:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	63	35	2	37	59	\$1.05
Precision production, craft, and repair occupations	62	36	2	39	62	1.03
Construction trades occupations	57	41	2	33	57	1.05
Brickmasons and stonemasons	35	65	—	10	—	—
Tile setters, hard and soft	40	60	—	17	—	—
Carpenters	60	40	—	32	54	0.90
Drywall installers	57	43	—	13	22	0.49
Electricians	74	26	—	61	82	1.07
Electrician apprentices	73	27	—	68	94	1.82
Painters, construction and maintenance	29	71	—	13	44	1.28
Plasterers	63	29	8	10	16	0.46
Plumbers, pipefitters, and steamfitters	81	18	1	67	82	1.01
Concrete and terrazzo finishers	58	27	15	39	68	0.87
Roofers	36	64	—	18	—	—
Sheetmetal duct installers	29	69	2	19	65	—
Structural metal workers	86	—	14	83	—	—
Construction trades, N.E.C.	45	48	7	28	62	0.69
Supervisors, construction trades	78	18	3	56	71	0.99
Supervisors; brickmasons, stonemasons, and tilesetters	52	48	—	29	—	—
Supervisors; carpenters and related workers ...	87	13	—	49	57	—
Supervisors; electricians and power transmission installers	92	8	—	91	99	1.34
Supervisors; painters, paperhangers, and plasterers	40	38	22	22	—	—
Supervisors; plumbers, pipefitters, and steamfitters	89	11	—	83	93	1.24
Supervisors; construction trades, N.E.C.	82	15	3	56	68	0.89
Other precision production, craft, and repair occupations	77	19	4	63	82	0.99
Electronic repairers, communications and industrial equipment	73	27	—	66	90	0.90
Heating, air conditioning, and refrigeration mechanics	72	25	4	54	75	1.12
Machine operators, assemblers, and inspectors	63	26	11	44	71	—
Welders and cutters	42	41	17	20	—	—
Transportation and material moving occupations	92	8	—	71	77	1.20
Truck drivers	94	6	—	68	73	1.33
Excavating and loading machine operators	88	12	—	70	79	1.13
Grader, dozer, and scraper operators	97	3	—	73	75	1.15
Handlers, equipment cleaners, helpers, and laborers	58	39	3	26	45	0.99
Helpers, mechanics and repairers	75	25	—	48	63	—
Helpers, construction trades	52	48	—	23	45	1.00
Construction laborers	62	33	5	27	44	1.01

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 9. Short-term disability benefits:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	2	97	1	2	100	\$0.03
Precision production, craft, and repair occupations	1	98	1	1	100	0.03
Construction trades occupations	1	98	1	1	—	—
Brickmasons and stonemasons	—	100	—	—	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	2	98	—	2	—	—
Drywall installers	—	100	—	—	—	—
Electricians	—	100	—	—	—	—
Electrician apprentices	—	100	—	—	—	—
Painters, construction and maintenance	—	100	—	—	—	—
Plasterers	—	92	8	—	—	—
Plumbers, pipefitters, and steamfitters	4	96	—	4	—	—
Concrete and terrazzo finishers	—	96	4	—	—	—
Roofers	—	100	—	—	—	—
Sheetmetal duct installers	—	100	—	—	—	—
Structural metal workers	—	86	14	—	—	—
Construction trades, N.E.C.	—	100	—	—	—	—
Supervisors, construction trades	1	97	2	1	—	—
Supervisors; brickmasons, stonemasons, and tilesetters	—	100	—	—	—	—
Supervisors; carpenters and related workers ...	—	100	—	—	—	—
Supervisors; electricians and power transmission installers	—	100	—	—	—	—
Supervisors; painters, paperhangers, and plasterers	—	78	22	—	—	—
Supervisors; plumbers, pipefitters, and steamfitters	15	85	—	15	—	—
Supervisors; construction trades, N.E.C.	1	99	—	1	—	—
Other precision production, craft, and repair occupations	2	94	4	2	—	—
Electronic repairers, communications and industrial equipment	—	100	—	—	—	—
Heating, air conditioning, and refrigeration mechanics	—	96	4	—	—	—
Machine operators, assemblers, and inspectors	—	92	8	—	—	—
Welders and cutters	—	87	13	—	—	—
Transportation and material moving occupations	3	97	—	3	—	—
Truck drivers	5	95	—	5	—	—
Excavating and loading machine operators	—	100	—	—	—	—
Grader, dozer, and scraper operators	—	100	—	—	—	—
Handlers, equipment cleaners, helpers, and laborers	3	95	2	3	100	0.04
Helpers, mechanics and repairers	—	100	—	—	—	—
Helpers, construction trades	8	92	—	8	—	—
Construction laborers	1	97	3	1	—	—

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 10. Long-term disability benefits:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	2	95	2	2	—	—
Precision production, craft, and repair occupations	2	96	2	2	—	—
Construction trades occupations	2	97	2	1	—	—
Brickmasons and stonemasons	—	100	—	—	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	4	96	—	4	—	—
Drywall installers	—	100	—	—	—	—
Electricians	—	100	—	—	—	—
Electrician apprentices	—	100	—	—	—	—
Painters, construction and maintenance	—	100	—	—	—	—
Plasterers	—	92	8	—	—	—
Plumbers, pipefitters, and steamfitters	—	100	—	—	—	—
Concrete and terrazzo finishers	—	85	15	—	—	—
Roofers	—	100	—	—	—	—
Sheetmetal duct installers	—	100	—	—	—	—
Structural metal workers	—	86	14	—	—	—
Construction trades, N.E.C.	1	92	7	1	—	—
Supervisors, construction trades	6	91	3	6	—	—
Supervisors; brickmasons, stonemasons, and tilesetters	—	100	—	—	—	—
Supervisors; carpenters and related workers	—	100	—	—	—	—
Supervisors; electricians and power transmission installers	4	96	—	4	—	—
Supervisors; painters, paperhangers, and plasterers	—	78	22	—	—	—
Supervisors; plumbers, pipefitters, and steamfitters	—	100	—	—	—	—
Supervisors; construction trades, N.E.C.	9	88	3	8	—	—
Other precision production, craft, and repair occupations	—	96	4	—	—	—
Electronic repairers, communications and industrial equipment	—	100	—	—	—	—
Heating, air conditioning, and refrigeration mechanics	—	96	4	—	—	—
Machine operators, assemblers, and inspectors	—	92	8	—	—	—
Welders and cutters	—	87	13	—	—	—
Transportation and material moving occupations	6	94	—	6	—	—
Truck drivers	—	100	—	—	—	—
Excavating and loading machine operators	—	100	—	—	—	—
Grader, dozer, and scraper operators	20	80	—	20	—	—
Handlers, equipment cleaners, helpers, and laborers	2	95	3	2	—	—
Helpers, mechanics and repairers	—	100	—	—	—	—
Helpers, construction trades	3	97	—	3	—	—
Construction laborers	3	93	5	3	—	—

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. Because of rounding, sums of individual items may not equal totals. N.E.C. means "not elsewhere classified."

Table 11. Defined benefit retirement:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	5	93	2	5	99	\$1.60
Precision production, craft, and repair occupations	6	92	2	6	99	1.97
Construction trades occupations	5	93	2	5	99	2.05
Brickmasons and stonemasons	—	100	—	—	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	4	96	—	4	—	—
Drywall installers	—	100	—	—	—	—
Electricians	21	79	—	21	100	1.89
Electrician apprentices	60	40	—	54	—	—
Painters, construction and maintenance	—	100	—	—	—	—
Plasterers	—	92	8	—	—	—
Plumbers, pipefitters, and steamfitters	7	93	—	7	—	—
Concrete and terrazzo finishers	—	85	15	—	—	—
Roofers	—	100	—	—	—	—
Sheetmetal duct installers	12	88	—	12	—	—
Structural metal workers	68	18	14	68	—	—
Construction trades, N.E.C.	—	93	7	—	—	—
Supervisors, construction trades	4	92	3	4	—	—
Supervisors; brickmasons, stonemasons, and tilesetters	—	100	—	—	—	—
Supervisors; carpenters and related workers ...	—	100	—	—	—	—
Supervisors; electricians and power transmission installers	51	49	—	51	—	—
Supervisors; painters, paperhangers, and plasterers	—	78	22	—	—	—
Supervisors; plumbers, pipefitters, and steamfitters	—	100	—	—	—	—
Supervisors; construction trades, N.E.C.	1	97	3	1	—	—
Other precision production, craft, and repair occupations	10	86	4	10	—	—
Electronic repairers, communications and industrial equipment	—	100	—	—	—	—
Heating, air conditioning, and refrigeration mechanics	11	85	4	11	—	—
Machine operators, assemblers, and inspectors	—	92	8	—	—	—
Welders and cutters	—	87	13	—	—	—
Transportation and material moving occupations	3	97	—	3	—	—
Truck drivers	5	95	—	5	—	—
Excavating and loading machine operators	—	100	—	—	—	—
Grader, dozer, and scraper operators	—	100	—	—	—	—
Handlers, equipment cleaners, helpers, and laborers	5	92	3	5	—	—
Helpers, mechanics and repairers	14	86	—	14	—	—
Helpers, construction trades	3	97	—	3	—	—
Construction laborers	7	89	5	7	—	—

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

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Table 12. Defined contribution retirement:¹ Access, participation, and employer costs² for blue-collar occupations, all workers, construction industries,³ Tucson, AZ, May 1998

Occupation ⁴	Percent of employees:			Percent of employees participating in the benefit	Percent of employees with access participating in the benefit	Employer cost for the benefit per hour worked per participant
	With access to the benefit	Without access to the benefit	Access not determinable			
All blue-collar occupations	30	68	2	16	53	\$0.67
Precision production, craft, and repair occupations	29	68	2	16	55	0.82
Construction trades occupations	26	72	2	14	54	0.77
Brickmasons and stonemasons	20	80	—	7	—	—
Tile setters, hard and soft	—	100	—	—	—	—
Carpenters	24	76	—	10	43	0.84
Drywall installers	5	95	—	2	—	—
Electricians	35	65	—	21	60	0.66
Electrician apprentices	—	100	—	—	—	—
Painters, construction and maintenance	12	88	—	6	—	—
Plasterers	36	57	8	18	—	—
Plumbers, pipefitters, and steamfitters	42	58	—	34	80	0.56
Concrete and terrazzo finishers	32	53	15	14	44	0.56
Roofers	22	78	—	17	—	—
Sheetmetal duct installers	34	66	—	7	—	—
Structural metal workers	68	18	14	68	—	—
Construction trades, N.E.C.	18	75	7	10	58	—
Supervisors, construction trades	33	63	3	20	61	1.18
Supervisors; brickmasons, stonemasons, and tilesetters	18	82	—	—	—	—
Supervisors; carpenters and related workers ...	11	89	—	—	—	—
Supervisors; electricians and power transmission installers	41	59	—	10	—	—
Supervisors; painters, paperhangers, and plasterers	36	42	22	18	—	—
Supervisors; plumbers, pipefitters, and steamfitters	32	68	—	32	—	—
Supervisors; construction trades, N.E.C.	37	61	3	26	70	1.09
Other precision production, craft, and repair occupations	48	49	4	26	55	0.54
Electronic repairers, communications and industrial equipment	21	79	—	13	—	—
Heating, air conditioning, and refrigeration mechanics	51	45	4	30	59	0.50
Machine operators, assemblers, and inspectors	12	79	8	1	—	—
Welders and cutters	19	67	13	2	—	—
Transportation and material moving occupations	63	37	—	38	60	0.35
Truck drivers	61	39	—	35	57	0.44
Excavating and loading machine operators	60	40	—	34	—	—
Grader, dozer, and scraper operators	76	24	—	49	—	—
Handlers, equipment cleaners, helpers, and laborers	23	74	3	10	44	0.49
Helpers, mechanics and repairers	53	47	—	14	—	—
Helpers, construction trades	18	82	—	7	38	0.43
Construction laborers	21	74	5	9	41	0.68

¹ See technical note for definition of benefits.

² The percent of employees with access to the benefit are those employees in an occupation who currently have, or eventually will be eligible for, the benefit. This includes employees who have not yet met an eligibility requirement or who do not make required contributions. Participation in a benefit is computed in two different ways: as a percent of all employees and as a percent of those employees with access to the benefit. Both of these calculations are presented in the table. The employer cost for the benefit is calculated by determining the annual cost per participant and dividing by annual hours worked. Cost per participant estimates in this publication differ from those produced in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. See the technical note for further information on access, participation, and employer

cost.

³ The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

⁴ A classification system including about 200 individual occupations is used to cover all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. Because of rounding, sums of individual items may not equal totals. N.E.C. means "not elsewhere classified."

Table 13. Number of blue-collar workers,¹ by occupational group and construction industries,² Tucson, AZ, May 1998

Occupation ³	All construction	Residential building construction	Nonresidential building construction	Highway and street construction	Heavy construction, except highway	Special trade contractors
All blue-collar occupations	12,712	863	642	630	848	9,729
Precision production, craft, and repair occupations	7,631	449	376	232	154	6,421
Construction trades occupations	5,820	340	229	131	80	5,040
Brickmasons and stonemasons	233	—	—	—	—	199
Tile setters, hard and soft	73	—	—	—	—	73
Carpenters	1,125	142	149	—	—	832
Drywall installers	903	—	—	—	—	888
Electricians	358	—	—	—	—	351
Electrician apprentices	78	—	—	—	—	65
Painters, construction and maintenance	562	—	—	—	—	543
Plasterers	255	—	—	—	—	229
Plumbers, pipefitters, and steamfitters	567	—	—	—	—	550
Concrete and terrazzo finishers	398	—	—	—	—	336
Roofers	182	—	—	—	—	172
Sheetmetal duct installers	226	—	—	—	—	222
Structural metal workers	92	—	—	—	—	—
Construction trades, N.E.C.	292	78	—	—	50	148
Supervisors, construction trades	1,179	109	147	—	—	798
Supervisors; brickmasons, stonemasons, and tilesetters	95	—	—	—	—	87
Supervisors; carpenters and related workers	84	—	—	—	—	—
Supervisors; electricians and power transmission installers	92	—	—	—	—	92
Supervisors; painters, paperhangers, and plasterers	92	—	—	—	—	67
Supervisors; plumbers, pipefitters, and steamfitters	83	—	—	—	—	—
Supervisors; construction trades, N.E.C.	732	75	127	—	—	449
Other precision production, craft, and repair occupations	632	—	—	—	—	582
Electronic repairers, communications and industrial equipment	79	—	—	—	—	79
Heating, air conditioning, and refrigeration mechanics	323	—	—	—	—	323
Machine operators, assemblers, and inspectors	153	—	—	—	—	149
Welders and cutters	97	—	—	—	—	93
Transportation and material moving occupations	972	—	—	213	197	—
Truck drivers	294	—	—	166	—	109
Excavating and loading machine operators	349	—	—	—	106	—
Grader, dozer, and scraper operators	290	—	—	—	—	—
Handlers, equipment cleaners, helpers, and laborers	3,955	408	183	181	497	2,686
Helpers, mechanics and repairers	52	—	—	—	—	52
Helpers, construction trades	1,446	136	—	—	—	1,237
Construction laborers	2,153	272	164	137	374	1,205

¹ All workers include full-time and part-time workers. Employees are classified as working either a full-time or a part-time schedule based on the definition used by each establishment. Therefore, a worker with a 35-hour-per-hour week schedule might be considered a full-time employee in one establishment, but classified as part-time in another firm, where a 40-hour week is the minimum full-time schedule.

² The 1987 *Standard Industrial Classification Manual* was used in classifying establishments. See technical note for more information.

³ A classification system including about 200 individual occupations is used to cover

all blue-collar workers in construction industries. Individual occupations are classified into one of four major occupational groups.

NOTE: Dashes indicate that no data were reported or that data did not meet publication criteria. Overall occupation groups may include data for categories not shown separately. Because of rounding, sums of individual items may not equal totals. N.E.C. means "not elsewhere classified."

Appendix A. Technical Note

This appendix provides basic information on the procedures and concepts used to produce the data contained in this bulletin. It is divided into three parts: Survey planning; data collection; and processing and analyzing the data.

Survey planning

The overall design of the survey, which was based on the type of data to be produced, had to be developed before data collection could begin.

Survey scope

This survey of the Tucson, AZ, Metropolitan Statistical Area covered establishments with one or more workers in the construction industry. The 1987 *Standard Industrial Classification Manual* was used in classifying establishments by industry.

For publication purposes, the construction industry was classified into the following categories:

- General Building Contractors - Residential Buildings and Operative Builders (SIC's 152-153)
- General Building Contractors - Nonresidential Buildings (SIC 154)
- Highway and Street Construction, except Elevated Highways (SIC 161)
- Heavy Construction, except Highway and Street Construction (SIC 162)
- Construction - Special Trade Contractors (SIC 17)

The Tucson, AZ, Metropolitan Statistical Area includes Pima County.

Sampling frame

The list of establishments from which the survey sample was selected (sampling frame) was developed from the State unemployment insurance reports for the Tucson, AZ, Metropolitan Statistical Area. Due to the volatility of the construction industry within the private sector, sampling frames were developed from December 1996, the most recent month of reference available at the time the sample was selected. The sampling frame was reviewed prior to the survey and, when necessary, missing establishments were added, out-of-business and out-of-scope establishments were removed, and addresses, employment levels, industry classification, and other information were updated.

Sample design

The sample for this survey was selected using a two-stage stratified design with probability proportional to em-

ployment sampling at each stage. The first stage of sample selection was a probability sample of establishments. The sample of establishments was drawn by first stratifying the sampling frame by industry. The number of sample establishments allocated to each stratum is approximately proportional to the stratum employment. Each sampled establishment is selected within a stratum with a probability proportional to its employment. Use of this technique means that the larger an establishment's employment, the greater its chance of selection. Weights were applied to each establishment when the data were tabulated so that the sample units within each sampling stratum represent all units in the stratum, both sampled and nonsampled. See appendix table 1 for a count of establishments by industry. The second stage of sample selection, detailed below, was a probability sample of occupations within a sampled establishment.

Data collection

BLS field economists collected the data. They contacted each establishment surveyed, primarily by personal visit.

Occupational selection and classification

Identification of the occupations for which data were to be collected was a multi-step process:

1. Refinement of establishment jobs to include only blue-collar occupations
2. Probability-proportional-to-size selection of establishment jobs
3. Classification of jobs into blue-collar occupations based on the Census of Population system
4. Characterization of jobs as full-time v. part-time, union v. nonunion, and time v. incentive

Wage and benefit data were collected for all workers with the same occupational classification and job characteristics of the individual worker selected.

In step one, the jobs to be sampled were selected at each establishment by the BLS field economist during a personal visit. A complete list of blue-collar employees was obtained, excluding all white-collar and service occupations. This list was used for sampling, with each selected worker representing a job within the establishment.

As with the selection of establishments, the selection of a job in step two was based on probability proportional to its size in the establishment. The greater the number of

people working in a job in the establishment, the greater its chance of selection.

The number of jobs collected in each establishment was based on the establishment's employment size as shown in the following schedule:

<i>Number of employees</i>	<i>Number of selected jobs</i>
1-49	4
50-249	6
250+	8

The third step of the process entailed classifying the selected jobs into occupations based on their duties. The occupational classification system is based on the 1990 Census of Population. A selected job may fall into any one of about 200 occupational classifications. In cases where a job's duties overlapped two or more census classification codes, the duties used to set the wage level were used to classify the job. Classification by primary duties was the fallback.

Each occupational classification is an element of a broader classification known as a major occupational group (MOG). Occupations can fall into any of the following MOG's:

- Precision production, craft, and repair
- Machine operators, assemblers, and inspectors
- Transportation and material moving
- Handlers, equipment cleaners, helpers, and laborers

A complete list of all individual occupations, classified by the MOG to which they belong, is contained in appendix B.

In the final step, certain job characteristics of the chosen worker were identified. First, the worker was identified as holding either a full-time or part-time job, based on the establishment's definition of those terms. Then the worker was classified as having a time versus incentive job, depending on whether any part of pay was directly based on the actual production of the worker, rather than solely on hours worked. Finally, the worker was identified as being in a union or a nonunion job. See the "Definition of terms" section for more details.

Collection period

The survey was collected from April through June 1998. The average payroll reference month was May 1998. For each establishment in the survey, the data reflect the establishment's practices on the day of collection.

Earnings

Earnings were defined as regular payments from the employer to the employee as compensation for straight-time hourly work, or for any salaried work performed. The following components were included as part of earnings:

- Incentive pay, including commissions, production bonuses, and piece rates

- Cost-of-living allowances
- Hazard pay
- Payments of income deferred due to participation in a salary reduction plan
- Deadhead pay, defined as pay given to transportation workers returning in a vehicle without freight or passengers

The following forms of payments were *not* considered part of straight-time earnings:

- Shift differentials, defined as extra payment for working a schedule that varies from the norm, such as night or weekend work
- Premium pay for overtime, holidays, and weekends
- Bonuses not directly tied to production (e.g., Christmas bonuses, profit-sharing bonuses)
- Uniform and tool allowances
- Free room and board
- Payments made by third parties (e.g., tips)
- On-call pay

Benefits

The collection of benefits included the following: paid leave (holidays, vacations, and sick leave); insurances (short-term disability, life, health, and long-term disability); and retirement benefits (defined benefit and defined contribution). These benefits are defined as follows:

Paid holidays. Holidays are days of special religious, cultural, social or patriotic significance on which work ordinarily ceases. Workers, either by agreement or company policy, receive time off at full or partial pay. If employees work on a holiday, they may receive holiday pay for the hours worked (possibly at a premium rate) or receive another day off in the future. Also included are floating holidays, which may vary from year-to-year at the discretion of the employer.

Paid vacations. Vacations are defined as leave from work normally taken in days or weeks, the purpose of which is extended rest or break. The amount of vacation time-off received each year may be a fixed amount or may vary based on a length of service schedule. Vacation time is usually taken at full or partial pay, but it may also be a percentage of earnings.

Paid sick leave. Sick leave is a benefit that continues all or part of income if the employee cannot work because of a non-work related illness or injury. Employees commonly receive their regular pay for a specified number of days off per year. Sick leave is provided on a **per year basis**, usually expressed in days. It is always employer paid and is never insured, although the benefit received by employees may be less than 100 percent of pay. This is in contrast to short-term disability (STD), which provides benefits on a **per disability basis**.

Life insurance. Life insurance provides cash to beneficiaries, in the event of employee death or dismemberment. The purpose of the benefit is to help beneficiaries pay for burial expenses and replace lost income resulting from death or dismemberment. The benefit is commonly distributed as a lump sum cash payment but it can also be distributed as an annuity.

Health insurance. Health care provides preventative and protective health care services to employees and their families. Included are medical and major medical plans, as well as dental, vision, and prescription drug plans. Plans may be financed through a private carrier, union fund, or self funded.

Short-term disability benefits. Short-term disability (STD), often called sickness and accident insurance, provides full, partial, or a combination of full and partial pay to employees who are unable to work because of a non-work related accident or illness. The duration of short-term disability benefits is a fixed number of weeks, usually 26, and benefits are provided on a **per-disability basis**. This is in contrast to sick leave, which provides benefits on a **per year basis**.

Long-term disability benefits. Long-term disability (LTD) provides salary continuation to employees who, due to illness or injury, are unable to work for an extended period of time. LTD benefit payments begin after a predetermined period of disability (generally 3 or 6 months). Payments are made until the end of the disability, the employee's retirement age, or for a specified number of months, depending on the employee's age at the time of disability. In most instances, the LTD payments equal a percent of pre-disability earnings. The illness/injury does not have to be job related.

Defined benefit retirement. A defined benefit retirement plan is a type of retirement plan that provides employees with a specified retirement benefit, generally monthly annuity payments. The benefit formula is predetermined and is typically based on salary and length of service. The employer contributions are usually not fixed; however, multi-employer plans have fixed employer contributions. Employers are obligated to provide enough funds to pay anticipated future benefits, including additional contributions to make up for any investment losses by the pension fund. Common provisions of defined benefit plans are coordination with Social Security payments, survivor annuities, disability retirement, and early retirement.

Defined contribution retirement. A defined contribution retirement plan is a type of retirement plan with an explicit method of determining employer contributions. Individual accounts are established for each employee, with periodic employer and/or employee contributions and investment earnings. Monetary benefits at retirement are a function of employer contributions, employee contributions, and the

return on the investment of employer and employee contributions. Employer contributions may come from current operating funds or from company profits, but not from company stock. Contributions are invested in such vehicles as stocks, bonds, securities, and money market funds.

Determining the cost of individual benefits

The cost estimates in this publication differ from those published in the Bureau's Employer Cost for Employee Compensation (ECEC) survey. Benefit cost levels in the ECEC reflect employer costs per occupational employee. The cents-per-hour worked benefit costs in this publication are determined as an occupational cost per participating employee. The definition of a "participating employee" varies by benefit area as follows:

For paid leave benefits – holidays, vacations, and sick leave – workers are considered participating employees when the following two conditions are met:

- The employee is covered by the benefit plan
- The employee is eligible to begin using the benefit plan

For insurance and retirement benefits – life, health, short-term disability, long-term disability, defined benefit, and defined contribution plans – workers are considered participating employees when the following three conditions are met:

- The employee is provided access to the benefit plan
- The employee is enrolled in the benefit plan
- The employer is currently making a benefit payment on behalf of the employee

The following examples illustrate the calculation of annual cost per participant for two benefits – holidays (a paid leave benefit) and health insurance (an insurance benefit).

Holiday example. Each employee in the selected occupation receives 10 paid holidays, paid at 8 hours of straight-time pay per holiday. All employees in the occupation receive the paid holidays, having met all eligibility requirements. The hourly wage is \$10. The annualized cost per participant is the number of paid holidays provided (10) times the rate at which each holiday is paid (8 hours at \$10 per hour). Since all employees are eligible to begin using the benefit, the holiday benefit cost for the occupation is $[10 \times (8 \times \$10)] = \800 per year per participant. This cost is then used to derive the cost per hour worked estimates in this publication.

Health insurance example. All employees in the occupation have access to a health insurance plan; however, 50 percent of the employees in the occupation elect not to participate in the plan because it requires an employee contribution. The employer's share of the premium for the occu-

pation is \$120 per participant per month. The annualized cost per participant is the monthly premium (\$120) times 12 months. The health insurance benefit cost for the occupation is $\$120 \times 12 = \$1,440$ per year per participant. This cost is then used to derive the cost per hour worked estimates in this publication.

Benefit access and participation

Tabulations in this bulletin present the percent of employees who have access to a benefit, the percent of employees who participate in a benefit, and the percent of employees with access to a benefit who participate. Benefit access is determined for each occupation. If the benefit is made available to that occupation, even if there is an eligibility requirement or mandatory employee contribution, all employees in the occupation are considered to have access to the benefit. The benefit tables in this bulletin indicate the percent of employees with access, without access, and those for which access could not be determined.

Participation is defined below. This information is presented in two ways: as a percent of all employees and as a percent of those employees who have access to the benefit.

For example, suppose 80 percent of all blue-collar construction workers had access to health insurance benefits. If, due to eligibility requirements and required contributions, only 60 percent of employees are actually enrolled in a health insurance plan, those 60 percent would be considered participants. The tabulations will indicate that 80 percent of employees have access to health insurance and 60 percent of employees participate in health insurance. In addition, 75 percent of employees with access to health insurance actually participate. This is calculated by dividing the percent of employees participating (60) by the percent of employees with access (80). $60 / 80 = 75$ percent.

Definition of terms

Access. Employees in an occupation who currently have, or will eventually be eligible for a benefit plan. For example, an employee may decline to participate in health insurance but still have access to the benefit. Similarly, an employer may establish a length of service requirement that the employee must satisfy to qualify for a benefit. An employee who may not be able to participate in a vacation plan currently, but will in the future, is considered to have access to the benefit.

Apprentice. Workers who learn a recognized skill, craft, or trade requiring one or more years of on-the-job training through job experience supplemented by related instruction. Apprentices must be in a formal program with an agreement or contract with the employer.

Cost-per-hour worked. Benefit costs are presented as a cost-per-hour worked. To accomplish this, all benefit data are converted to an annual cost per participant and divided by the annual hours worked. For example, a health insurance premium paid on a quarterly basis must be multiplied

by 4 to arrive at an annual cost per participant. To calculate annual hours worked, leave hours are subtracted from straight-time and overtime hours. The result is the cost of health insurance per hour worked.

Full-time worker. Any employee that the employer considers to be full time.

Helpers. Semi-skilled workers who assist other workers of usually higher levels of competence or skill. Helpers perform a variety of duties such as furnishing another worker with materials, tools, and supplies; cleaning work areas, machines, and equipment; feeding or offbearing machines; holding materials and tools; and performing routine duties. Helpers specialize in a particular craft or trade. A helper may learn a trade but does so informally and without contract or agreement with the employer.

Journey-level workers. Skilled workers who have completed a specified training program or have qualifying experience in a craft or trade occupation.

Laborers. Unskilled workers who perform tasks at the work area. Laborers do not assist other workers and do not have an area of trade specialization.

Nonunion worker. An employee in an occupation not meeting the conditions for union coverage (see below).

Participation. The percentage of employees in an occupation who are actually enrolled in a benefit plan. For insurance and retirement benefits, participation is defined as the percent of employees that have met the eligibility requirements, are enrolled in the benefit, and on whose behalf the employer is making a contribution. For leave benefits, participation is defined as the percent of workers that are offered the benefit and have met the eligibility requirements to begin using the benefit.

Part-time worker. Any employee that the employer considers to be part-time.

Straight-time. Time worked at the standard rate of pay for the job.

Union worker. Any employee is in a union occupation when all of the following conditions are met:

- A labor organization is recognized as the bargaining agent for all workers in the occupation.
- Wage and salary rates are determined through collective bargaining or negotiations.
- Settlement terms, which must include earnings provisions and may include benefit provisions, are embodied in a signed mutually binding collective bargaining agreement.

Processing and analyzing the data

Data were processed and analyzed at the Bureau's National Office following collection.

Weighting and nonresponse adjustment

Sample weights were calculated for each establishment/occupation in the survey. These weights reflected the relative size of the occupation within the establishment and of the establishment within the sample universe. Weights were used to aggregate the individual establishment/occupations into the various data series. Of the establishments surveyed, 12.5 percent (representing 1,946 employees covered by the survey) refused to supply information. If data were not provided by a sample member, the weights of responding sample members in the same or similar "cells" were adjusted to account for the missing data. This technique assumes that the mean value of the nonrespondents equals the mean value of the respondents at some detailed "cell" level. Responding and nonresponding establishments were classified into these cells according to industry and employment size. Responding and nonresponding occupations within responding establishments were classified into cells which were additionally defined by major occupation group, and adjustments to the weights of the responding occupations were made to account for missing occupational data.

Establishments that were determined to be out of business or outside the scope of the survey (18.5 percent of the total sample representing 2,721 workers) had their weights changed to zero.

Estimation

The wage series in the tables are computed by combining the wages for individual establishment/occupations. Before being combined, individual wage rates are weighted by the number of workers and the sample weight adjusted for nonresponding establishments and occupations.

The benefit tables reflect the sample weight adjustments listed above, but no additional nonresponse adjustments were made for those establishments providing wage information and unable or unwilling to provide information on whether their establishment offered one or more of the employee benefits studied. The percent of workers where all benefit information was unavailable was about 1 percent.

Percentages for individual benefits and occupations are shown as "not determinable" in the benefit tables.

In instances where respondents were unable to provide the costs of individual benefits, values were imputed based on the average cost of the same benefit in similar establishments/occupations. When respondents were unable to separate the costs of individual benefits, an algorithm was used to allocate the costs among the various benefits based on similar establishments/occupations.

For establishments that had a benefit plan, but that refused or were unable to provide information on employee participation, a logistic regression was used to estimate participation levels. A logistic regression ensures that the estimated participation values are between 0 and 100 percent. The percent of workers where participation data were unavailable was less than 2 percent.

As a result of the use of sampling weights, the number of workers estimates represent the total in all establishments within the scope of the study and not the actual number surveyed.

Data reliability

The data in these tables are estimates from a scientifically selected probability sample. There are two types of errors possible in an estimate based on a sample survey, sampling and nonsampling.

Sampling errors occur because observations come only from a sample, not the entire population. The particular sample used in this survey is one of a number of possible samples of the same size that could have been selected using the sample design. Estimates derived from the different samples would differ from each other. Sampling errors were not computed for this survey.

Nonsampling errors also affect survey results. They can stem from many sources, such as inability to obtain information for some establishments, difficulties with survey definitions, inability of the respondents to provide correct information, or mistakes in recording or coding the data obtained. A Technical Reinterview Program done in all survey areas will be used in the development of a formal quality assessment process to help control the magnitude of nonsampling error. Although they also were not specifically measured, efforts were made to minimize the nonsampling errors by the extensive training of the field economists who gathered the survey data by personal visit, computer edits of the data, and detailed data review.

Appendix table 1. Establishments and workers within scope of survey and number sampled, Tucson, AZ,¹ May 1998

Industry ²	Number of establishments		Workers in establishments	
	Within scope of survey ³	Sampled	Within scope of survey ⁴	Sampled
All construction	1,660	450	15,104	10,253
Residential building construction ⁵	361	44	1,465	695
Nonresidential building construction	104	33	933	780
Highway and street construction	17	17	472	739
Heavy construction, except highway	51	27	919	790
Special trade contractors	1,127	329	11,315	7,249

¹ The Tucson Metropolitan Statistical Area, as defined by the Office of Management and Budget through October 1994, consists of Pima county. The "workers within scope of survey" estimates provide a reasonably accurate description of the size and composition of the labor force included in the survey. Estimates are not intended, however, for comparison with other statistical series to measure employment trends or levels since planning of wage surveys requires establishment data compiled considerably in advance of the payroll period studied.

² The 1987 *Standard Industrial Classification Manual* was

used in classifying establishments by this type of construction. See appendix for more information.

³ Includes all private construction establishments within the Tucson area.

⁴ Includes white-collar, blue-collar, and service workers in private construction establishments working within the Tucson area.

⁵ Includes operative builders engaged in the construction of single-family houses and other buildings for sale on their own account rather than as contractors.

Appendix B. Occupational Classifications

NOTE: The occupational classification system is based on the 1990 Census of Population. The 4-digit code before each occupation title is used to classify blue-collar occupations into a major occupational group. This survey included all blue-collar workers, those classified in major groups E through H.

Major group E:

PRECISION PRODUCTION, CRAFT, AND REPAIR OCCUPATIONS

MECHANICS AND REPAIRERS

- E503 Supervisors: Mechanics and Repairers
- E505 Automobile Mechanics
- E506 Automobile Mechanic Apprentices
- E507 Bus, Truck, and Stationary Engine Mechanics
- E508 Aircraft Engine Mechanics
- E509 Small Engine Repairers
- E514 Automobile Body and Related Repairers
- E515 Aircraft Mechanics, Except Engine
- E516 Heavy Equipment Mechanic
- E517 Farm Equipment Mechanics
- E518 Industrial Machinery Repairers
- E519 Machinery Maintenance Occupations
- E523 Electronic Repairers, Communications and Industrial Equipment
- E525 Data Processing Equipment Repairers
- E526 Household Appliance and Power Tool Repairers
- E527 Telephone Line Installers and Repairers
- E529 Telephone Installers and Repairers
- E534 Heating, Air Conditioning, and Refrigeration Mechanics
- E535 Camera, Watch, and Musical Instrument Repairers
- E536 Locksmiths and Safe Repairers
- E538 Office Machine Repairers
- E539 Mechanical Controls and Valve Repairers
- E543 Elevator Installers and Repairers
- E544 Millwrights
- E547 Mechanics and Repairers, n.e.c.

SUPERVISORS, CONSTRUCTION TRADES

- E553 Supervisors: Brickmasons, Stonemasons, and Tilesetters
- E554 Supervisors: Carpenters and Related Workers
- E555 Supervisors: Electricians and Power Transmission Installers
- E556 Supervisors: Painters, Paperhangers, and Plasterers
- E557 Supervisors: Plumbers, Pipefitters, and Steamfitters
- E558 Supervisors: Construction Trades, n.e.c.

CONSTRUCTION TRADES OCCUPATIONS

- E563 Brickmasons and Stonemasons
- E564 Brickmason and Stonemason Apprentices
- E565 Tile Setters, Hard and Soft
- E566 Carpet Installers
- E567 Carpenters
- E569 Carpenter Apprentices
- E573 Drywall Installers
- E575 Electricians
- E576 Electrician Apprentices
- E577 Electrical Power Installers and Repairers
- E579 Painters, Construction and Maintenance
- E583 Paperhangers
- E584 Plasterers
- E585 Plumbers, Pipefitters, and Steamfitters
- E587 Plumber, Pipefitter, and Steamfitter Apprentices
- E588 Concrete and Terrazzo Finishers
- E589 Glaziers
- E593 Insulation Workers
- E594 Paving, Surfacing, and Tamping Equipment Operators

E595 Roofers
E596 Sheetmetal Duct Installers
E597 Structural Metal Workers
E598 Drillers, Earth
E599 Construction Trades, n.e.c.

EXTRACTIVE OCCUPATIONS

E613 Supervisors: Extractive Occupations
E614 Drillers, Oil Well
E615 Explosives Workers
E616 Mining Machine Operators
E617 Mining Occupations, n.e.c.

PRECISION PRODUCTION OCCUPATIONS

E628 Supervisors: Production Occupations

PRECISION METAL WORKING OCCUPATIONS

E634 Tool and Die Makers
E635 Tool and Die Maker Apprentices
E636 Precision Assemblers, Metal
E637 Machinists
E639 Machinist Apprentices
E643 Boilermakers
E644 Precision Grinders, Filers, and Tool Sharpeners
E645 Patternmakers and Modelmakers, Metal
E646 Layout Workers
E647 Precious Stones and Metals Workers
E649 Engravers, Metal
E653 Sheet Metal Workers
E654 Sheet Metal Worker Apprentices

PRECISION WOODWORKING OCCUPATIONS

E656 Patternmakers and Modelmakers, Wood
E657 Cabinet Makers and Bench Carpenters
E658 Furniture and Wood Finishers

PRECISION TEXTILE, APPAREL, AND FURNISHINGS MACHINE WORKERS

E666 Dressmakers
E667 Tailors
E668 Upholsterers
E669 Shoe Repairers

PRECISION WORKERS, ASSORTED MATERIALS

E675 Hand Molders and Shapers, Except Jewelers
E676 Patternmakers, Layout Workers, and Cutters
E677 Optical Goods Workers

E678 Dental Laboratory and Medical Appliance Technicians
E679 Bookbinders
E683 Electrical and Electronic Equipment Assemblers
E684 Miscellaneous Precision Workers, n.e.c.

PRECISION FOOD PRODUCTION OCCUPATIONS

E685 Precision Food Production Occupations, n.e.c.
E686 Butchers and Meat Cutters
E687 Bakers
E688 Food Batchmakers

PRECISION INSPECTORS, TESTERS, AND RELATED WORKERS

E689 Inspectors, Testers, and Graders
E690 Precision Inspectors, Testers, and Related Workers, n.e.c.
E693 Adjusters and Calibrators

PLANT AND SYSTEM OPERATORS

E694 Water and Sewage Treatment Plant Operators
E695 Power Plant Operators
E696 Stationary Engineers
E699 Miscellaneous Plant and System Operators, n.e.c.

Major group F:

MACHINE OPERATORS, ASSEMBLERS, AND INSPECTORS

METALWORKING AND PLASTIC WORKING MACHINE OPERATORS

F703 Lathe and Turning-Machine Set-Up Operators
F704 Lathe and Turning-Machine Operators
F705 Milling and Planing Machine Operators
F706 Punching and Stamping Press Operators
F707 Rolling Machine Operators
F708 Drilling and Boring Machine Operators
F709 Grinding, Abrading, Buffing, and Polishing Machine Operators
F713 Forging Machine Operators
F714 Numerical Control Machine Operators
F717 Fabricating Machine Operators, n.e.c.
F719 Molding and Casting Machine Operators
F723 Metal Plating Machine Operators
F724 Heat Treating Equipment Operators

WOODWORKING MACHINE OPERATORS

- F726 Wood Lathe, Routing, and Planing Machine Operators
- F727 Sawing Machine Operators
- F728 Shaping and Joining Machine Operators
- F729 Nailing and Tacking Machine Operators

PRINTING MACHINE OPERATORS

- F734 Printing Press Operators
- F735 Photoengravers and Lithographers
- F736 Typesetters and Compositors

TEXTILE, APPAREL, AND FURNISHINGS MACHINE OPERATORS

- F738 Winding and Twisting Machine Operators
- F739 Knitting, Looping, Taping, and Weaving Machine Operators
- F743 Textile Cutting Machine Operators
- F744 Textile Sewing Machine Operators
- F745 Shoe Machine Operators
- F747 Pressing Machine Operators
- F748 Laundering and Dry Cleaning Machine Operators

MACHINE OPERATORS, ASSORTED MATERIALS

- F753 Cementing and Gluing Machine Operators
- F754 Packaging and Filling Machine Operators
- F755 Extruding and Forming Machine Operators
- F756 Mixing and Blending Machine Operators
- F757 Separating, Filtering, and Clarifying Machine Operators
- F758 Compressing and Compacting Machine Operators
- F759 Painting and Paint Spraying Machine Operators
- F763 Roasting and Baking Machine Operators, Food
- F764 Washing, Cleaning, and Pickling Machine Operators
- F765 Folding Machine Operators
- F766 Furnace, Kiln, and Oven Operators, Except Food
- F768 Crushing and Grinding Machine Operators
- F769 Slicing and Cutting Machine Operators
- F773 Motion Picture Projectionists
- F774 Photographic Process Machine Operators
- F777 Miscellaneous Machine Operators, n.e.c.

FABRICATORS, ASSEMBLERS, AND HAND WORKING OCCUPATIONS

- F783 Welders and Cutters
- F784 Solderers and Braziers
- F785 Assemblers
- F786 Hand Cutting and Trimming Occupations
- F787 Hand Molding, Casting, and Forming Occupations
- F789 Hand Painting, Coating, and Decorating Occupations
- F793 Hand Engraving and Printing Occupations
- F795 Miscellaneous Hand Working Occupations, n.e.c.

PRODUCTION INSPECTORS, TESTERS, SAMPLERS, AND WEIGHERS

- F796 Production Inspectors, Checkers, and Examiners
- F797 Production Testers
- F798 Production Samplers and Weighers
- F799 Graders and Sorters, Except Agricultural
- F800 Hand Inspectors, n.e.c.

Major group G:

TRANSPORTATION AND MATERIAL MOVING OCCUPATIONS

MOTOR VEHICLE OPERATORS

- G803 Supervisors: Motor Vehicle Operators
- G804 Truck Drivers
- G806 Driver-Sales Workers
- G808 Bus Drivers
- G809 Taxicab Drivers and Chauffeurs
- G813 Parking Lot Attendants
- G814 Motor Transportation Occupations, n.e.c.

RAILROAD TRANSPORTATION OCCUPATIONS

- G823 Railroad Conductors and Yardmasters
- G824 Locomotive Operating Occupations
- G825 Railroad Brake, Signal, and Switch Operators
- G826 Rail Vehicle Operators, n.e.c.

WATER TRANSPORTATION OCCUPATIONS

- G828 Ship Captains and Mates, Except Fishing Boats

- G829 Sailors and Deckhands
- G833 Marine Engineers
- G834 Bridge, Lock, and Lighthouse Tenders

MATERIAL MOVING EQUIPMENT OPERATORS

- G843 Supervisors: Material Moving Equipment Operators
- G844 Operating Engineers
- G845 Longshore Equipment Operators
- G848 Hoist and Winch Operators
- G849 Crane and Tower Operators
- G853 Excavating and Loading Machine Operators
- G855 Grader, Dozer, and Scraper Operators
- G856 Industrial Truck and Tractor Equipment Operators
- G859 Miscellaneous Material Moving Equipment Operators, n.e.c.

Major group H:

HANDLERS, EQUIPMENT CLEANERS, HELPERS, AND LABORERS

FARM, FISHING AND FORESTRY OCCUPATIONS - NONFARM SECTOR

- H483 Marine Life Cultivation Workers
- H484 Nursery Workers

- H485 Supervisors, Agriculture-Related Workers
- H486 Groundskeepers and Gardeners, Except Farm
- H487 Animal Caretakers, Except Farm
- H489 Inspectors, Agricultural Products
- H494 Supervisors, Forestry and Logging Workers
- H495 Forestry Workers, Except Logging
- H496 Timber Cutting and Logging Occupations
- H497 Captains and Other Officers, Fishing Vessels
- H498 Fishers, Hunters, and Trappers

HELPERS, HANDLERS, AND LABORERS

- H864 Supervisors: Handlers, Equipment Cleaners, and Laborers, n.e.c.
- H865 Helpers, Mechanics and Repairers
- H866 Helpers, Construction Trades
- H867 Helpers, Surveyor
- H868 Helpers, Extractive Occupations
- H869 Construction Laborers
- H874 Production Helpers
- H875 Garbage Collectors
- H876 Stevedores
- H877 Stock Handlers and Baggers
- H878 Machine Feeders and Offbearers
- H883 Freight, Stock, and Material Handlers, n.e.c.
- H885 Garage and Service Station Related Occupations
- H887 Vehicle Washers and Equipment Cleaners
- H888 Hand Packers and Packagers
- H889 Laborers, Except Construction, n.e.c.