

Test Surveys of the Construction Industry

BLS recently published the results of two test surveys on compensation in the construction industry in the Jacksonville, FL and Tucson, AZ Metropolitan Statistical Areas. This article reviews the earnings results of these surveys.

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The Bureau of Labor Statistics (BLS) and the Employment Standards Administration (ESA), agencies of the U.S. Department of Labor, agreed to have BLS conduct four test surveys of the construction industry. These surveys are intended to determine the feasibility of collecting data in employer costs for employee compensation for blue-collar occupations in local areas. They are also designed to assist ESA in determining prevailing wages and benefits for construction workers employed on federally funded projects.

This article discusses the earnings results of the surveys conducted in Jacksonville, FL and Tucson, AZ¹ Metropolitan Statistical Areas (MSAs). The results of the test surveys in Salt Lake City, UT and Toledo, OH will be available in the future.

Survey design

The surveys covered all private construction establishments in the two MSAs. The list of establishments (the sampling frame) from which the survey sample was selected was developed from State unemployment insurance reports. Sampling frames were developed

from the December 1996 reports, the most recent month of reference available at the time of sample selection.

The sample of establishments were drawn by first stratifying the sampling frame by the following five construction categories within the Standard Industrial Classification (SIC) system:

- General contractors (residential building)
- General contractors (nonresidential building)
- Highway and street construction
- Heavy construction, except highway and street
- Special trade contractors

Establishments were selected within each category with a probabil-

This is the first of two articles dealing with the results of two test surveys on compensation in the construction industry in the Jacksonville, FL and Tucson, AZ Metropolitan Statistical Areas. It reviews the earning results of these surveys. The second article, which reviews the retirement benefits results, starts on page 15.

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ity proportionate to employment size (that is, the larger an establishment's employment, the greater its chance of selection). Weights were applied to each sampled establishment so all establishments would be represented.

The surveys of the Jacksonville and Tucson MSAs were conducted between February and June 1998. BLS field economists collected data through personal visits. The Jacksonville survey sampled 500 establishments with 10,728 workers to represent the 2,451 firms and 26,862 workers estimated to be in the construction industry in Jacksonville. Similarly, 450 establishments with 10,253 workers were studied to represent the 1,660 firms and 15,104 workers estimated to be in the construction industry in Tucson.²

From a complete list of an establishment's blue-collar occupations a random selection of occupations (each with a probability of selection proportional to size) was made by BLS economists. The nearly 200 selected blue-collar occupations were classified into one of four major occupational groups (MOGs):

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

The final step involved identifying various characteristics, including full- or part-time work schedule, union or nonunion status, and time or incentive pay basis.

Sample weights were calculated for each establishment and occupation so survey estimates would represent total employment in the sampling frame. These weights reflected the relative size of the establishment within the survey and the relative size of the occupation within the establishment. Weights were used to aggregate the

individual establishments and occupations into the various data series. If a sampled establishment did not provide data, the weights of responding sampled establishments in the same industry and classification were adjusted to account for the missing data.

Average hourly earnings were computed by first combining the wages for workers in occupations within individual establishments. Individual wage rates were weighted according to the number of workers in the establishment. Occupation weights were adjusted to compensate for nonresponding establishments.

Earnings

Straight-time hourly earnings³ in construction averaged \$11.35 for the 16,400 blue-collar workers in Jacksonville during April 1998 and \$11.18 for 12,712 comparable workers in Tucson 1 month later. (See table 1.)

The earnings of individual major occupational groups relative to the overall earnings in each area followed predictable patterns. In Jacksonville, earnings for handlers, equipment cleaners, helpers, and laborers were 72 percent of earnings of the area's blue-collar workers. In Tucson, earnings for similar workers were 74 percent of the earnings of blue-collar workers. With few exceptions, this pattern occurred within MOGs and for individual occupations as well. For example, the relative earnings of construction trades supervisors were 44 percent higher than for all blue-collar workers in both areas. An exception to the pattern was found among transportation and material moving occupations in Tucson, where workers enjoyed higher relative earnings than did their counterparts in Jacksonville.

Precision production, craft, and repair occupations. Over 60 percent of the blue-collar workers found in construction were in the major occupational group precision production, craft, and repair. Average hourly earnings for these workers were \$12.92 in Jacksonville and \$12.49 in Tucson.

Over three-fourths of the workers in this MOG were employed in construction trades occupations. Earnings for these workers averaged \$12.29 per hour in Jacksonville and \$11.79 in Tucson.

Survey estimates include average hourly earnings for the most populous construction trades in the two areas. In Jacksonville and Tucson, respectively, hourly earnings for painters averaged \$9.66 and \$10.20; carpenters, \$11.67 and \$11.23; electricians, \$15.60 and \$13.85; and plumbers, pipefitters, and steamfitters, \$14.75 and \$13.54.

Apprentices are workers who are learning a recognized craft or trade through a formal program of on-the-job training supplemented by related instruction.⁴ The only estimates of apprentice earnings that met publication standards were for electrician apprentices, who earned \$10.25 in Jacksonville and \$9.81 in Tucson.

Included within the precision production, craft, and repair MOG are supervisors of construction trade workers. They assign and examine work, monitor work performance and procedures, and resolve work problems. They also suggest and initiate plans for increased work efficiency. Hourly earnings for supervisors in Jacksonville and Tucson averaged \$16.35 and \$16.06, respectively. Supervisors received more than a 30-percent pay advantage over construction trades occupations. In Jacksonville, supervisors of carpenters earned \$15.85 an hour; and supervisors of plumbers, pipefitters, and steamfitters earned \$18.43. In Tucson, hourly earnings of supervisors of carpenters averaged \$16.70; and supervisors of plumbers, pipefitters, and steamfitters, \$16.64.

Machine operators, assemblers, and inspectors. Approximately 1 percent of workers were machine operators, assemblers, and inspectors. In Jacksonville, these workers averaged \$10.56 an hour, about the same as in Tucson. Over half the workers in this category, welders and cutters, averaged \$10.95 in Jacksonville and \$9.90 in Tucson.

Transportation and material moving occupations. Approximately 8 percent of blue-collar workers in construction in the two survey areas were classified in the transportation and material moving major occupational group. Hourly earnings for these workers were \$9.80 in Jacksonville and \$12.73 in Tucson. Workers in this MOG are usually found in the highway and street and heavy construction industries. Over 80 percent of workers were classified into one of the following occupations: Truckdrivers, which includes drivers of all capacities and also includes concrete mixer drivers; excavating and loading machine operators, which includes those who use machinery equipped with scoops or shovels such as backhoes or earth moving equipment to excavate loose material; and grader, dozer, and scraper operators, which includes those who use equipment with blades such as bulldozers, to remove or grade earth.

Hourly earnings for transportation and material moving occupations were lowest for truckdrivers, \$9.32 and \$10.67 in Jacksonville and Tucson, respectively. The highest earnings were reported for grader, dozer, and scraper operators, \$10.04 in Jacksonville and \$14.88 in Tucson.

Handlers, equipment cleaners, helpers, and laborers. Nearly 30 percent of blue-collar workers were in this MOG. Over 90 percent of workers in this category were classified as helpers or laborers. Helpers assist workers who specialize in one craft, while laborers perform tasks at the work area and do not have a trade specialization.

Among these less-skilled occupations, hourly earnings in Jacksonville averaged \$7.95 for construction trades helpers and \$8.29 for construction laborers. In Tucson, comparable earnings were \$7.66 for helpers and \$8.65 for laborers.

Union and nonunion workers. The relatively small proportion of union workers in construction in both metropolitan statistical areas (MSAs) earned more than their nonunion counterparts. Union workers in Jacksonville represented 17 percent of blue-collar construction workers in the MSA and earned \$14.81 per hour. Their counterparts in Tucson represented 5 percent of the Tucson MSA workers and averaged \$14.80 per hour. In contrast, nonunion workers earned \$10.63 in Jacksonville and \$10.98 in Tucson. (See table 2.) Union workers in construction trades occupations averaged \$15.13 in Jacksonville and \$15.73 in Tucson. Comparable nonunion workers averaged \$11.52 in Jacksonville and \$11.58 in Tucson. Comparisons between earnings of union and nonunion occupations were limited because of the small number of union workers. The earnings differentials between union and nonunion workers were a function of the higher proportion of union workers in higher skilled jobs, as well as higher pay within comparable occupations.

Earnings among construction industries

Among different construction industries, earnings in Jacksonville and Tucson were highest in nonresidential building construction, \$11.85 and \$13.78, respectively. (See tables 3 and 4.) The lowest earnings were reported in the highway and street construction industry in Jacksonville, \$8.69, and in residential building construction in Tucson, \$10.75.

Over two-thirds of blue-collar workers in the construction industry in both MSAs worked for special trade contractors (SIC 17). (See table 5.) These firms undertake specialized activities such as painting, electrical work, plumbing, and roofing. Special trade contractors subcontract specific work from a general contractor, or work directly for a consumer.

General building contractors (SIC 15) employed about 15 percent of blue-collar workers in construction. They were divided into two categories—residential buildings and operative builders, and nonresidential buildings. This group includes builders primarily engaged in the construction of residential, industrial, commercial, or other buildings.

Heavy construction contractors (SIC 16) also employed about 15 percent of blue-collar workers. They were also divided into two categories—highway and street construction (other than elevated highways) and heavy construction, except highways and streets.

Because of the differences of work within each category, there are few occupations available for comparison. In Jacksonville, however, average hourly earnings for carpenters ranged from \$10.68 in residential housing construction to \$12.50 in the special trade contractors category. Among the three construction industries allowing comparison in Tucson, carpenters earned \$10.69 in the special trade contractors category, \$11.73 in residential building construction, and \$13.75 in nonresidential housing construction.

In Jacksonville, highway and street construction laborers were the lowest paid, at \$7.60 per hour; and nonresidential construction laborers were the highest paid, at \$9.07 per hour. In Tucson, earnings ranged from \$7.82 among special trade contractors to \$11.35 in heavy construction.

Summary

The Jacksonville and Tucson surveys provided earnings data for a wide variety of occupations in the construction industry. Results from the recent surveys in Salt Lake City and Toledo will be available shortly. The Employment Standards Administration is currently evaluating the survey results and has not asked BLS to conduct comparable surveys in other areas. ■

¹ Detailed information is available in *Jacksonville, FL, Wages and Benefits, Construction Industry Test Survey, April 1998*, Bulletin 2510-1 (Bureau of Labor Statistics, October 1998); and *Tucson, AZ, Wages and Benefits, Construction Industry Test Survey, May 1998*, Bulletin 2510-2 (Bureau of Labor Statistics, October 1998).

² For more information, see *Jacksonville Test Survey*, p. 22; and *Tucson Test Survey*, p. 22.

³ 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 straight-time earnings: Incentive pay, includ-

ing commissions, production bonuses, and piece rates; cost-of-living allowances; hazard pay; payments of income deferred due to participation in salary reduction plans; and dead-head 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 (for example, Christmas bonuses, profit-sharing bonuses); uniform or tool allowances; free room and board; payments

made by third parties (for example, tips); and on-call pay.

⁴ Eight apprentice-specific occupations exist within the blue-collar categories in the *1990 Occupational Classification System Manual* (Bureau of Labor Statistics, 1993). This 1990 manual is based on the *1990 Census of Population and Housing Classified Index of Industries and Occupations*. Within the construction trades, apprenticeship trade categories exist for brickmasons and stonemasons; carpenters; electricians; and plumbers, pipefitters, and steamfitters. Other apprenticeship categories exist for sheet metal workers, tool and die makers, machinists, and automobile mechanics.

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TABLE 1. Number of workers, average hourly earnings, and pay relatives, construction blue-collar occupations, Jacksonville, FL and Tucson, AZ, April-May 1998

Occupation ¹	Jacksonville, FL ²			Tucson, AZ ²		
	Number of workers ³	Mean hourly earnings ⁴	Pay relative ⁵	Number of workers ³	Mean hourly earnings ⁴	Pay relative ⁵
All blue-collar workers	16,400	\$11.35	(100)	12,712	\$11.18	(100)
Precision production, craft, and repair	10,471	12.92	(114)	7,631	12.49	(112)
Construction trades	8,111	12.29	(108)	5,820	11.79	(105)
Brickmasons and stonemasons	97	14.76	(130)	233	11.96	(107)
Carpenters	2,160	11.67	(103)	1,125	11.23	(100)
Drywall installers	622	11.38	(100)	903	11.71	(105)
Electricians	1,526	15.60	(137)	358	13.85	(124)
Electrician apprentices	435	10.25	(90)	78	9.81	(88)
Painters	514	9.66	(85)	562	10.20	(91)
Plasters	101	11.54	(102)	255	10.91	(98)
Plumbers, pipefitters, and steamfitters	759	14.75	(130)	567	13.54	(121)
Concrete and terrazzo finishers	134	10.33	(91)	398	11.58	(104)
Roofers	342	10.95	(96)	182	10.05	(90)
Sheetmetal duct installers	159	14.07	(124)	226	11.00	(98)
Construction trades, n.e.c.	521	9.87	(87)	292	12.20	(109)
Supervisors, construction trades	1,371	16.35	(144)	1,179	16.06	(144)
Carpenters and related workers	303	15.85	(140)	84	16.70	(149)
Painters, paperhangers, and plasters	106	13.62	(120)	92	14.95	(134)
Plumbers, pipefitters, and steamfitters	293	18.43	(162)	83	16.64	(149)
Construction trades, n.e.c.	493	15.38	(136)	732	15.88	(142)
Other precision production, craft, and repair	988	13.36	(118)	632	12.19	(109)
Heating, air conditioning, and refrigeration mechanics	385	12.37	(109)	323	12.16	(109)
Machine operators, assemblers, and inspectors	153	10.56	(93)	153	10.58	(95)
Welders and cutters	80	10.95	(96)	97	9.90	(89)
Transportation and material moving	1,340	9.80	(86)	972	12.73	(114)
Truckdrivers	457	9.32	(82)	294	10.67	(95)
Excavating and loading machine operators	378	9.68	(85)	349	12.24	(109)
Grader, dozer, and scraper operators	182	10.04	(88)	290	14.88	(133)
Handlers, equipment cleaners, helpers, and laborers .	4,436	8.13	(72)	3,955	8.27	(74)
Helpers, mechanics and repairers	114	8.20	(72)	52	8.22	(74)
Helpers, construction trades	2,234	7.95	(70)	1,446	7.66	(69)
Construction laborers	1,844	8.29	(73)	2,153	8.65	(77)

¹ 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.

² The Jacksonville, FL metropolitan statistical area (MSA) includes Clay, Duval, Nassau, and St. Johns Counties. The Tucson, AZ MSA consists of Pima County.

³ The number of workers includes full- and part-time workers.

⁴ Earnings are straight-time hourly wages or salaries paid to employees. Earnings for Jacksonville and Tucson are for April and May of

1998, respectively. They include incentive pay, cost-of-living adjustments, and hazard pay. Excluded are premium pay for overtime, vacations, holidays, non-production 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.

⁵ The pay relative is the ratio between earnings for the individual occupation or occupational group and all blue-collar workers in the survey.

NOTE: Overall occupational groups may include data for categories not shown separately. n.e.c. means not elsewhere classified.

TABLE 2. Average hourly earnings¹ for construction blue-collar occupations in Jacksonville, FL and Tucson, AZ by union affiliation, April-May 1998

Occupation ²	Jacksonville, FL ³		Tucson, AZ ³	
	Union ⁴	Nonunion	Union ⁴	Nonunion
All blue-collar workers	\$14.81	\$10.63	\$14.80	\$10.98
Precision production, craft, and repair	15.92	12.01	15.91	12.29
Construction trades	15.13	11.52	15.73	11.58
Supervisors, construction trades	18.63	15.29	-	15.97
Other precision production, craft, and repair	16.48	12.07	-	11.88
Machine operators, assemblers and inspectors	-	10.56	-	10.58
Transportation and material moving	-	9.77	-	12.70
Handlers, equipment cleaners, helpers, and laborers	7.68	8.17	12.72	8.02

¹ Earnings are straight-time hourly wages or salaries paid to employees. Earnings for Jacksonville and Tucson are for April and May of 1998, respectively. They include incentive pay, cost-of-living adjustments, and hazard pay. Excluded are premium pay for overtime, vacations, holidays, non-production 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.

² 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.

³ The Jacksonville, FL metropolitan statistical area (MSA) includes Clay, Duval, Nassau, and St. Johns Counties. The Tucson, AZ MSA consists of Pima County.

⁴ Union workers are workers whose wages are determined through collective bargaining.

NOTE: Overall occupational groups may include data for categories not shown separately. A dash indicates that data are not available.

TABLE 3. Average hourly earnings¹ for blue-collar occupations in Jacksonville, FL² by construction industry,³ April 1998

Occupation ⁴	Residential building construction	Nonresidential building construction	Highway and street construction	Heavy construction	Special trade contractors
All blue-collar workers	\$10.75	\$11.85	\$8.69	\$10.08	\$11.70
Precision production, craft, and repair	11.61	13.08	-	12.02	13.20
Construction trades	10.77	11.60	-	11.22	12.74
Carpenters	10.68	12.22	-	11.60	12.50
Supervisors, construction trades	16.20	17.97	-	14.52	16.33
Other precision production, craft, and repair	-	-	-	-	13.12
Machine operators, assemblers, and inspectors	-	-	-	-	10.68
Transportation and material moving	-	-	9.26	9.95	9.91
Handlers, equipment cleaners, helpers, and laborers	8.03	8.44	7.75	7.95	8.17
Construction laborers	-	9.07	7.60	7.96	8.54

¹ Earnings are 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, non-production 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.

² The Jacksonville, FL metropolitan statistical area includes Clay, Duval, Nassau, and St. Johns Counties.

³ The 1987 *Standard Industrial Classification (SIC) Manual* was used in classifying establishments. The construction industries are defined as follows: General Building Contractors-Residential Buildings and Operative Builders (SIC 152 and 153); General Building

Contractors-Nonresidential Building (SIC 154); Highway and Street Construction, except Elevated Highways (SIC 161), Heavy Construction, except Highway and Street Construction (SIC 162), and Construction-Special Trade Contractors (SIC 17).

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 1 of 4 major occupational groups.

NOTE: Overall occupational groups may include data for categories not shown separately. A dash indicates that data are not available.

TABLE 4. Average hourly earnings¹ for blue-collar occupations in Tucson, AZ² by construction industry,³ May 1998

Occupation ⁴	Residential building construction	Nonresidential building construction	Highway and street construction	Heavy construction	Special trade contractors
All blue-collar workers	\$10.75	\$13.78	\$12.56	\$11.67	\$10.91
Precision production, craft, and repair	13.19	15.74	15.95	13.47	12.10
Construction trades	11.72	12.74	14.54	10.76	11.70
Carpenters	11.73	13.75	-	-	10.69
Supervisors, construction trades	17.62	20.42	-	16.32	14.85
Other precision production, craft, and repair	-	-	-	-	11.77
Machine operators, assemblers and inspectors	-	-	-	-	10.54
Transportation and material moving	-	-	11.35	13.22	-
Handlers, equipment cleaners, helpers, and laborers	8.04	8.74	9.67	10.49	7.77
Construction laborers	8.41	8.54	9.24	11.35	7.82

¹ Earnings are 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, non-production 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.

² The Tucson, AZ Metropolitan Statistical Area consists of Pima County.

³ The 1987 *Standard Industrial Classification (SIC) Manual* was used in classifying establishments. The construction industries are defined as follows: General Building Contractors-Residential Buildings and Operative Builders (SIC 152 and 153);

General Building Contractors-Nonresidential Building (SIC 154); Highway and Street Construction, except Elevated Highways (SIC 161), Heavy Construction, except Highway and Street Construction (SIC 162), and Construction-Special Trade Contractors (SIC 17).

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: Overall occupational groups may include data for categories not shown separately. A dash indicates that data are not available.

TABLE 5. Number of blue-collar workers in Jacksonville, FL, and Tucson, AZ by construction industry, April-May, 1998

Industry ¹	Jacksonville, FL ²	Tucson, AZ ²
	Number of workers ³	Number of workers ³
All construction workers	16,400	12,712
Residential building construction	1,426	863
Nonresidential building construction	1,426	642
Highway and street construction	528	630
Heavy construction, except highway	1,924	848
Special trades contractors	11,097	9,729

¹ The 1987 *Standard Industrial Classification (SIC) Manual* was used in classifying establishments. The construction industries are defined as follows: General Building Contractors-Residential Buildings and Operative Builders (SIC 152 and 153); General Building Contractors-Nonresidential Building (SIC 154); Highway and Street Construction, except Elevated Highways (SIC 161), Heavy Construction, except Highway and Street Construction (SIC

162), and Construction-Special Trade Contractors (SIC 17).

² The Jacksonville, FL Metropolitan Statistical Area (MSA) includes Clay, Duval, Nassau, and St. Johns Counties. The Tucson, AZ MSA consists of Pima County.

³ The number of workers includes full- and part-time workers.

NOTE: Because of rounding, sums of individual items may not equal totals.