



# **2013**

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# **NATIONAL REPAIR & REMODELING ESTIMATOR**

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**by Albert S. Paxton**

**Edited by J. A. O'Grady**



#### **Includes inside the back cover:**

- An estimating CD with all the costs in this book, plus,
- An estimating program that makes it easy to use these costs,
- An interactive video guide to the National Estimator program,
- A program that converts your estimates into invoices,
- A program that exports your estimates to QuickBooks Pro.

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## Preface

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The author has corresponded with manufacturers and wholesalers of building material supplies and surveyed retail pricing services. From these sources, he has developed Average Material Unit Costs which should apply in most parts of the country.

Wherever possible, the author has listed Average Labor Unit Costs which are derived from the Average Manhours per Unit, the Crew Size, and the Wage Rates used in this book. Please read How to Use This Book for a more in-depth explanation of the arithmetic.

If you prefer, you can develop your own local labor unit costs. You can do this by simply multiplying the Average Manhours per Unit by your local crew wage rates per hour. Using your actual local labor wage rates for the trades will make your estimate more accurate.

What is a realistic labor unit cost to one reader may well be low or high to another reader, because of variations in labor efficiency. The Average Manhours per Unit figures were developed by time studies at job sites around the country. To determine the daily production rate for the crew, divide the total crew manhours per day by the Average Manhours per Unit.

The subject topics in this book are arranged in alphabetical order, A to Z. To help you find specific construction items, there is a complete alphabetical index at the end of the book, and a main subject index at the beginning of the book.

This manual shows crew, manhours, material, labor and equipment cost estimates based on Large or Small Volume work, then a total cost and a total including overhead and profit. No single price fits all repair and remodeling jobs. Generally, work done on smaller jobs costs more per unit installed and work on larger jobs costs less. The estimates in this book reflect that simple fact. The two estimates you find for each work item show the author's opinion of the likely range of costs for most contractors and for most jobs. So, which cost do you use, High Volume or Low Volume?

The only right price is the one that gets the job and earns a reasonable profit. Finding that price always requires estimating judgment. Use Small Volume cost estimates when some or most of the following conditions are likely:

- The crews won't work more than a few days on site.
- Better quality work is required.
- Productivity will probably be below average.
- Volume discounts on materials aren't available.
- Bidding is less competitive.
- Your overhead is higher than most contractors.

When few or none of those conditions apply, use Large Volume cost estimates.

## Credits and Acknowledgments

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This book has over 12,000 cost estimates for 2013. To develop these estimates, the author and editors relied on information supplied by hundreds of construction cost authorities. We offer our sincere thanks to the contractors, engineers, design professionals, construction estimators,

American Standard Products  
DAP Products  
Outwater Plastic Industries  
Con-Rock Concrete  
Georgia Pacific Products

material suppliers and manufacturers who, in the spirit of cooperation, have assisted in the preparation of this 36th edition of the *National Repair & Remodeling Estimator*. Our appreciation is extended to those listed below.

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Henry Roofing Products

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## About the Author

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Albert Paxton is president of Professional Construction Analysts, Inc., located at 5823 Filaree Heights Ave., Malibu, CA 90265-3944; [alpaxton@pca-group.net](mailto:alpaxton@pca-group.net); fax (310) 589-0400. Mr. Paxton is a California licensed General Contractor (B1-425946). PCA's staff is comprised of estimators, engineers and project managers who are also expert witnesses, building appraisers and arbitrators operating throughout the United States.

**PCA** clients include property insurance carriers, financial institutions, self-insureds, and private individuals.

The expertise of **PCA** is in both new and repair-remodel construction, both commercial and residential structures. In addition to individual structures, **PCA** assignments have included natural disasters such as the Northridge earthquake in California, Hurricanes Charley, Frances, Ivan and Jeanne striking Florida and the southeastern states, the catastrophic Hurricane Katrina, whose impact on the Gulf Coast is still being felt in the building and repair industry, Hurricanes Dolly and Ike, and, even as this book is being printed, cleanup, repair and rebuilding of the massive destruction of Superstorm Sandy.

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# How to Use This Book

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Description	Oper	Unit	Vol	Crew Size	Man- hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P

The descriptions and cost data in this book are arranged in a series of columns, which are described below. The cost data is divided into two categories: Costs Based On Large Volume and Costs Based On Small Volume. These two categories provide the estimator with a pricing range for each construction topic.

The Description column (1) contains the pertinent, specific information necessary to make the pricing information relevant and accurate.

The Operation column (2) contains a description of the construction repair or remodeling operation being performed. Generally the operations are Demolition, Install, and Reset.

The Unit column (3) contains the unit of measurement or quantity which applies to the item described.

The Volume column (4) breaks jobs into Large and Small categories. Based on the information given regarding volume (on page 2), select your job size.

The Crew Size column (5) contains a description of the trade that usually installs or labors on the specified item. It includes information on the labor trade that installs the material and the typical crew size. Letters and numbers are used in the abbreviations in the crew size column. Full descriptions of these abbreviations are in the Crew Compositions and Wage Rates table, beginning on page 15.

The Manhours per Unit column (6) is for the listed operation and listed crew.

The units per day in this book don't take into consideration unusually large or small quantities. But items such as travel, accessibility to work, experience of workers, and protection of undamaged property, which can favorably or adversely affect productivity, have been considered in developing Average Manhours per Unit. For further information about labor, see "Notes — Labor" in the Notes Section of some specific items.

Crew Output per Day (7) is based on how many units, on average, a crew can install or demo in one 8-hour day.

Crew Output per Day and Average Material Unit (8) Cost should assist the estimator in:

1. Checking prices quoted by others.
2. Developing local prices.

The Average Material Unit Cost column contains an average material cost for products (including, in many cases, the by-products used in installing the products) for both large and small volume. It doesn't include an allowance for sales tax, delivery charges, overhead and profit. Percentages for waste, shrinkage, or coverage have been taken into consideration unless indicated. For other information, see "Dimensions" or "Installation" in the Notes Section.

If the item described has many or very unusual by-products which are essential to determining the Average Material Unit Cost, the author has provided examples of material pricing. These examples are placed throughout the book in the Notes Section.

You should verify labor rates and material prices locally. Though the prices in this book are average material prices, prices vary from locality to locality. A local hourly wage rate should normally include taxes, benefits, and insurance. Some contractors may also include overhead and profit in the hourly rate.

The Average Labor Unit Cost column (9) contains an average labor cost based on the Average Manhours per Unit and the Crew Compositions and Wage Rates table. The average labor unit cost equals the Average Manhours per Unit multiplied by the Average Crew Rate per hour. The rates include fringe benefits, taxes, and insurance. Examples that show how to determine the average labor unit cost are provided in the Notes Section.

The Average Equipment Unit Cost column (10) contains an average equipment cost, based on both the average daily rental and the cost per day if owned and depreciated. The costs of daily maintenance and the operator are included.

The Average Total Unit Cost column (11) includes the sum of the Material, Equipment, and Labor Cost columns. It doesn't include an allowance for overhead and profit.

The Average (Total) Price Including Overhead and Profit column (12) results from adding an overhead and profit allowance to Total Cost. This allowance reflects the author's interpretation of average fixed and variable overhead expenses and the labor intensiveness of the operation vs. the costs of materials for the operation. This allowance factor varies throughout the book, depending on the operation. Each contractor interprets O&P differently. The range can be from 15 percent to 80 percent of the Average Total Unit Cost.

# Estimating Techniques

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## **Estimating Repair/Remodeling Jobs: The unforeseen, unpredictable, or unexpected can ruin you.**

Each year, the residential repair and remodeling industry grows. It's currently outpacing residential new construction due to increases in land costs, labor wage rates, interest rates, material costs, and economic uncertainty. When people can't afford a new home, they tend to remodel their old one. And there are always houses that need repair, from natural disasters or accidents like fire. The professional repair and remodeling contractor is moving to the forefront of the industry.

Repair and remodeling spawns three occupations: the contractor and his workers, the insurance company property claims adjuster, and the property damage appraiser. Each of these professionals shares common functions, including estimating the cost of the repair or remodeling work.

Estimating isn't an exact science. Yet the estimate determines the profit or loss for the contractor, the fairness of the claim payout by the adjuster, and the amount of grant or loan by the appraiser. Quality estimating must be uppermost in the mind of each of these professionals. And accurate estimates are possible only when you know exactly what materials are needed and the number of manhours required for demolition, removal, and installation. Remember, profits follow the professional. To be profitable you must control costs — and cost control is directly related to accurate, professional estimates.

There are four general types of estimates, each with a different purpose and a corresponding degree of accuracy:

- The guess method: "All bathrooms cost \$5,000." or "It looks like an \$8,000 job to me."
- The per measure method: (I like to call it the surprise package.) "Remodeling costs \$60 per SF, the job is 500 SF, so the price is \$30,000."

These two methods are the least accurate and accomplish little for the adjuster or the appraiser. The contractor might use the methods for qualifying customers (e.g., "I thought a bathroom would only cost \$2,000."), but never as the basis for bidding or negotiating a price.

- The *piece estimate* or *stick-by-stick* method.
- The *unit cost estimate* method.

These two methods yield a detailed estimate itemizing all of the material quantities and costs, the labor manhours and wage rates, the subcontract costs, and the allowance for overhead and profit.

Though time-consuming, the detailed estimate is the most accurate and predictable. It's a very satisfactory

tool for negotiating either the contract price or the adjustment of a building loss. The piece estimate and the unit cost estimate rely on historical data, such as manhours per specific job operation and recent material costs. The successful repair and remodeling contractor, or insurance/appraisal company, maintains records of previous jobs detailing allocation of crew manhours per day and materials expended.

While new estimators don't have historical data records, they can rely on reference books, magazines, and newsletters to estimate manhours and material costs. It is important to remember that **the reference must pertain to repair and remodeling**. This book is designed *specifically* to meet this requirement.

The reference material must specialize in repair and remodeling work because there's a large cost difference between new construction and repair and remodeling. Material and labor construction costs vary radically with the size of the job or project. Economies of scale come into play. The larger the quantity of materials, the better the purchase price should be. The larger the number of units to be installed, the greater the labor efficiency.

Repair and remodeling work, compared to new construction, is more expensive due to a normally smaller volume of work. Typical repair work involves only two or three rooms of a house, or one roof. In new construction, the job size may be three to five complete homes or an entire development. And there's another factor: a lot of repair and remodeling is done with the house occupied, forcing the crew to work around the normal, daily activities of the occupants. In new construction, the approach is systematic and logical — work proceeds from the ground up to the roof and to the inside of the structure.

Since the jobs are small, the repair and remodeling contractor doesn't employ trade specialists. Repairers employ the "jack-of-all-trades" who is less specialized and therefore less efficient. This isn't to say the repairer is less professional than the trade specialist. On the contrary, the repairer must know about many more facets of construction: not just framing, but painting, finish carpentry, roofing, and electrical as well. But because the repairer has to spread his expertise over a greater area, he will be less efficient than the specialist who repeats the same operation all day long.

Another factor reducing worker efficiency is poor access to the work area. With new construction, where building is an orderly "from the ground up" approach, workers have easy access to the work area for any given operation. The workers can spread out as much as needed, which facilitates efficiency and minimizes the manhours required to perform a given operation.

The opposite situation exists with repair and remodeling construction. Consider an example where the work area involves fire damage on the second floor. Materials either go up through the interior stairs or through a second



story window. Neither is easy when the exterior and interior walls have a finished covering such as siding and drywall. That results in greater labor costs with repair and remodeling because it takes more manhours to perform many of the same tasks.

If, as a professional estimator, you want to start collecting historical data, the place to begin is with daily worker time sheets that detail:

1. total hours worked by each worker per day
2. what specific operations each worker performed that day
3. how many hours (to the nearest tenth) each worker used in each operation performed that day.

Second, you must catalog all material invoices daily, being sure that quantities and unit costs per item are clearly indicated.

Third, maintain a record of overhead expenses attributable to the particular project. Then, after a number of jobs, you'll be able to calculate an average percentage of the job's gross amount that's attributable to overhead. Many contractors add 45% for overhead and profit to their total direct costs (direct labor, direct material, and direct subcontract costs). But that figure may not be right for your jobs.

Finally, each week you should reconcile in a job summary file the actual costs versus the estimated costs, and determine why there is any difference. This information can't immediately help you on this job since the contract has been signed, but it will be invaluable to you on your next job.

Up to now I've been talking about general estimating theory. Now let's be more specific. On page 8 is a Building Repair Estimate form. Each line is keyed to an explanation. A filled-out copy of the form is also provided, and on page 10, a blank, full-size copy that you can reproduce for your own use.

You can adapt the Building Repair Estimate form, whether you're a contractor, adjuster, or appraiser. Use of the form will yield a detailed estimate that will identify:

- The room or area involved, including sizes, dimensions and measurements.
- The kind and quality of material to be used.
- The quantities of materials to be used and verification of their prices.
- The type of work to be performed (demolish, remove, install, remove and reset) by what type of crew.
- The crew manhours per job operation and verification of the hourly wage scale.
- All arithmetical calculations that can be verified.
- Areas of difference between your estimate and others.

- Areas that will be a basis for negotiation and discussion of details.

Each job estimate begins with a visual inspection of the work site. If it's a repair job, you've got to see the damage. Without a visual inspection, you can't select a method of repair and you can't properly evaluate the opinions of others regarding repair or replacement. With either repair or remodeling work, the visual inspection is essential to uncover the "hiders" — the unpredictable, unforeseen, and unexpected problems that can turn profit into loss, or simplicity into nightmare. You're looking for the many variables and unknowns that exist behind an exterior or interior wall covering.

Along with the Building Repair Estimate form, use this checklist to make sure you're not forgetting anything.

## Checklist

- Site accessibility: Will you store materials and tools in the garage? Is it secure? You can save a half hour to an hour each day by storing tools in the garage. Will the landscaping prevent trucks from reaching the work site? Are wheelbarrows or concrete pumpers going to be required?
- Soil: What type and how much water content? Will the soil change your excavation estimate?
- Utility lines: What's under the soil and where? Should you schedule the utilities to stake their lines?
- Soundness of the structure: If you're going to remodel, repair or add on, how sound is that portion of the house that you're going to have to work around? Where are the load-bearing walls? Are you going to remove and reset any walls? Do the floor joists sag?
- Roof strength: Can the roof support the weight of another layer of shingles. (Is four layers of composition shingles already too much?)
- Electrical: Is another breaker box required for the additional load?

This checklist is by no means complete, but it is a start. Take pictures! A digital camera will quickly pay for itself. When you're back at the office, the picture helps reconstruct the scene. Before and after pictures are also a sales tool representing your professional expertise.

During the visual inspection always be asking yourself "what if" this or that happened. Be looking for potential problem areas that would be extremely labor intensive or expensive in material to repair or replace.

Also spend some time getting to know your clients and their attitudes. Most of repair and remodeling work occurs while the house is occupied. If the work will be messy, let the homeowners know in advance. Their satisfaction is your ultimate goal — and their satisfaction will provide you a pleasant working atmosphere. You're there to communicate with them. At the end of an estimate and visual inspection, the homeowner should have a clear idea of what you can or can't do, how it will be

done, and approximately how long it will take. Don't discuss costs now! Save the estimating for your quiet office with a print-out calculator and your cost files or reference books.

What you create on your estimate form during a visual inspection is a set of rough notes and diagrams that make the estimate speak. To avoid duplications and omissions, estimate in a *systematic sequence of inspection*. There are two questions to consider. First, where do you start the estimate? Second, in what order will you list the damaged or replaced items? It's customary to start in the room having either the most damage or requiring the most extensive remodeling. The sequence of listing is important. Start with either the floor or the ceiling. When starting with the floor, you might list items in the following sequence: Joists, subfloor, finish floor, base — listing from bottom to top. When starting with the ceiling, you reverse, and list from top to bottom. The important thing is to be *consistent* as you go from room to room! It's a good idea to figure the roof and foundation separately, instead of by the room.

After completing your visual inspection, go back to your office to cost out the items. Talk to your material supply houses and get unit costs for the quantity involved. Consult your job files or reference books and assign crew manhours to the different job operations.

There's one more reason for creating detailed estimates. Besides an estimate, what else have your notes given you? A material take-off sheet, a lumber list, a plan and specification sheet — the basis for writing a job summary for comparing estimated costs and profit versus actual costs and profit — and a project schedule that minimizes down time.


Here's the last step: Enter an amount for overhead and profit. No matter how small or large your work volume is, be realistic — everyone has overhead. An office,

even in your home, costs money to operate. If family members help out, pay them. Everyone's time is valuable!

Don't forget to charge for performing your estimate. A professional expects to be paid. You'll render a better product if you know you're being paid for your time. If you want to soften the blow to the owner, say the first hour is free or that the cost of the estimate will be deducted from the job price if you get the job.

In conclusion, whether you're a contractor, adjuster, or appraiser, you're selling your personal service, your ideas, and your reputation. To be successful you must:

- Know yourself and your capabilities.
- Know what the job will require by ferreting out the "hiders."
- Know your products and your work crew.
- Know your productivity and be able to deliver in a reasonable manner and within a reasonable time frame.
- Know your client and make it clear that all change orders, no matter how large or small, will cost money.

 Inside the back cover of this book you'll find an envelope with a compact disk. The disk has National Estimator, an easy-to-use estimating program with all the cost estimates in this book. Insert the CD in your computer and wait a few seconds. Installation should begin automatically. (If not, click Start, Settings, Control Panel, double-click Add/Remove Programs and Install.) Select ShowMe from the installation menu and Dan will show you how to use National Estimator. When ShowMe is complete, select Install Program. When the National Estimator program has been installed, click Help on the menu bar, click Contents, click Print all Topics, click File and click Print Topic to print a 28-page instruction manual for National Estimator.





## Keyed Explanations of the Building Repair Estimate Form

1. Insert name of insured(s).
2. Insert claim number or, if claim number is not available, insert policy number or binder number.
3. Insert the page number and the total number of pages.
4. Insert street address, city and state where loss or damage occurred.
5. Insert type of loss (wind, hail, fire, water, etc.)
6. Check YES if there is other insurance, whether collectible or not. Check NO if there's only one insurer.
7. Insert the present replacement cost of the building. What would it cost to build the structure today?
8. Insert present actual cash value of the building.
9. Insert the amount of insurance applicable. If there is more than one insurer, insert the total amount of applicable insurance provided by all insurers.
10. If the amount of insurance required is based on replacement cost value, circle RCV and insert the percent required by the policy, if any.
11. If the amount of insurance required is based on actual cash value, circle ACV and insert the percent required by the policy, if any.  
*Note:* (regarding 10 and 11) if there is a non-concurrency, i.e., one insurer requires insurance to 90% of value while another requires insurance to 80% of value, make a note here. Comment on the non-concurrency in the settlement report.
12. The installed price and/or material price only, as expressed in columns 13 through 15, may include any of the following (expressed in units and unit prices):
  - Material only (no labor)
  - Material and labor to replace
  - Material and labor to remove and replace

*Unit Cost* is determined by dividing dollar cost by quantity. The term cost, as used in unit cost, is not intended to include any allowance, percentage or otherwise, for overhead or profit. Usually, overhead and profit are expressed as a percentage of cost. Cost must be determined first. Insert a line or dash in a space(s) in columns 13, 14, 15, 17, 18 or 19 if the space is not to be used.
13. The *units* column includes both the quantity and the unit of measure, i.e., 100 SF, 100 BF, 200 CF, 100 CY, 20 ea., etc.
14. The *unit price* may be expressed in dollars, cents or both. If the units column has 100 SF and if the unit price column has \$.10, this would indicate the price to be \$.10 per SF.
15. The *total* column is merely the dollar product of the quantity (in column 13) times the price per unit measure (in column 14).
- 16-19. These columns are normally used to express labor as follows: hours times rate per hour. However, it is possible to express labor as a unit price, i.e., 100 SF in column 13, a dash in column 17, \$.05 in column 18 and \$5.00 in column 19.
20. Under *description of item*, the following may be included:
  - Description of item to be repaired or replaced (studs 2" x 4" 8'0" #2 Fir, Sheetrock 1/2", etc.)
  - Quantities or dimensions (20 pcs., 8'0" x 14'0", etc.)
  - Location within a room or area (north wall, ceiling, etc.)
  - Method of correcting damage (paint - 1 coat; sand, fill and finish; R&R; remove only; replace; resize; etc.)
- 21-22. Dollar totals of columns A and B respectively.
- 23-27. Spaces provided for items not included in the body of the estimate (subtotals, overhead, profit, sales tax, etc.)
28. Total cost of repair.
29. Insert the agreed amount here. The agreement may be between the claim representative and the insured or between the claim rep and the repairer. If the agreed price is different from the grand total, the reason(s) for the difference should be itemized on the estimate sheet. If there is no room, attach an additional estimate sheet.
30. PRINT the name of the insured or the repairer so that it is legible.
31. PRINT the address of the insured or repairer legibly. Include phone number.
32. The insured or a representative of the repairer should sign here indicating agreement with the claim rep's estimate.
33. Insured or representative of the repairer should insert date here.
34. Claim rep should sign here.
35. Claim rep should insert date here.
36. Insert name of service office here.



# Wage Rates Used in This Book

Wage rates listed here and used in this book were compiled in the fall of 2012 and projected to mid-2013. Wage rates are in dollars per hour.

“Base Wage Per Hour” (Col. 1) includes items such as vacation pay and sick leave which are normally taxed as wages. Nationally, these benefits average 5.15% of the Base Wage Per Hour. This amount is paid by the Employer in addition to the Base Wage Per Hour.

“Liability Insurance and Employer Taxes” (Cols. 3 & 4) include national averages for state unemployment insurance (4.00%), federal unemployment insurance (0.80%), Social Security and Medicare tax (7.65%), li-

bility insurance (2.29%), and Workers’ Compensation Insurance which varies by trade. This total percentage (Col. 3) is applied to the sum of Base Wage Per Hour and Taxable Fringe Benefits (Col. 1 + Col. 2) and is listed in Dollars (Col. 4). This amount is paid by the Employer in addition to the Base Wage Per Hour and the Taxable Fringe Benefits.

“Non-Taxable Fringe Benefits” (Col. 5) include employer-sponsored medical insurance and other benefits, which nationally average 4.55% of the Base Wage Per Hour.

“Total Hourly Cost Used In This Book” is the sum of Columns 1, 2, 4, & 5.

Trade	1 Base Wage Per Hour	2 Taxable Fringe Benefits (5.15% of Base Wage)	3 Liability Insurance & Employer Taxes %	4 \$	5 Non-Taxable Fringe Benefits (4.55% of Base Wage)	6 Total Hourly Cost Used in This Book
Air Tool Operator	\$23.14	\$1.19	32.93%	\$8.01	\$1.05	\$33.39
Bricklayer or Stone Mason	\$26.94	\$1.39	25.54%	\$7.24	\$1.23	\$36.80
Bricktender	\$19.84	\$1.02	25.54%	\$5.33	\$0.90	\$27.09
Carpenter	\$25.15	\$1.30	31.83%	\$8.42	\$1.14	\$36.01
Cement Mason	\$25.22	\$1.30	23.35%	\$6.19	\$1.15	\$33.86
Electrician, Journeyman Wireman	\$29.86	\$1.54	20.04%	\$6.29	\$1.36	\$39.05
Equipment Operator	\$29.86	\$1.54	25.42%	\$7.98	\$1.36	\$40.74
Fence Erector	\$27.09	\$1.40	26.21%	\$7.47	\$1.23	\$37.19
Floorlayer: Carpet, Linoleum, Soft Tile	\$24.25	\$1.25	24.02%	\$6.13	\$1.10	\$32.73
Floorlayer: Hardwood	\$25.46	\$1.31	24.02%	\$6.43	\$1.16	\$34.36
Glazier	\$24.79	\$1.28	25.98%	\$6.77	\$1.13	\$33.97
Laborer, General Construction	\$20.12	\$1.04	32.93%	\$6.97	\$0.92	\$29.05
Lather	\$26.38	\$1.36	21.48%	\$5.96	\$1.20	\$34.90
Marble and Terrazzo Setter	\$23.69	\$1.22	21.56%	\$5.37	\$1.08	\$31.36
Painter, Brush	\$27.02	\$1.39	25.08%	\$7.13	\$1.23	\$36.77
Painter, Spray-Gun	\$27.83	\$1.43	25.08%	\$7.34	\$1.27	\$37.87
Paperhanger	\$28.37	\$1.46	25.08%	\$7.48	\$1.29	\$38.60
Plasterer	\$26.02	\$1.34	28.78%	\$7.87	\$1.18	\$36.41
Plumber	\$30.47	\$1.57	24.47%	\$7.84	\$1.39	\$41.27
Reinforcing Ironworker	\$24.80	\$1.28	28.81%	\$7.51	\$1.13	\$34.72
Roofer, Foreman	\$28.45	\$1.46	44.34%	\$13.26	\$1.29	\$44.46
Roofer, Journeyman	\$25.86	\$1.33	44.34%	\$12.06	\$1.18	\$40.43
Roofer, Hot Mop Pitch	\$26.64	\$1.37	44.34%	\$12.42	\$1.21	\$41.64
Roofer, Wood Shingles	\$27.15	\$1.40	44.34%	\$12.66	\$1.24	\$42.45
Sheet Metal Worker	\$29.45	\$1.52	26.21%	\$8.12	\$1.34	\$40.43
Tile Setter	\$25.41	\$1.31	21.56%	\$5.76	\$1.16	\$33.64
Tile Setter Helper	\$19.52	\$1.01	21.56%	\$4.43	\$0.89	\$25.85
Truck Driver	\$21.63	\$1.11	26.42%	\$6.01	\$0.98	\$29.73

# Area Modification Factors

Construction costs are higher in some areas than in other areas. Add or deduct the percentages shown on the following pages to adapt the costs in this book to your job site. Adjust your cost estimate by the appropriate percentages in this table to find the estimated cost for the site selected. Where 0% is shown, it means no modification is required.

Modification factors are listed alphabetically by state and province. Areas within each state are listed by the first three digits of the postal zip code. For convenience, one representative city is identified in each three-digit zip or range of zips. Percentages are based on the average of all data points in the table.

Factors listed for each state and province are the average of all data points in that state or province. Figures for three-digit zips are the average of all five-digit zips in that area, and are the weighted average of factors for labor, material and equipment.

The National Estimator program will apply an area modification factor for any five-digit zip you select. Click Utilities. Click Options. Then select the Area Modification Factors tab.

These percentages are composites of many costs and will not necessarily be accurate when estimating the cost of any particular part of a building. But when used to modify costs for an entire structure, they should improve the accuracy of your estimates.

<b>Alabama</b> <b>-6%</b>	Herlong	961	.....	.0%	Norwich	63	.....	-6%	<b>Hawaii</b>	<b>24%</b>							
Anniston	362	.....	-.9%	Inglewood	902-905	...	.8%	Stamford	068-069	...15%							
Auburn	368	.....	-.6%	Irvine	926-927	...	.11%	Waterbury	67	.....	-.9%						
Bellamy	369	.....	-.4%	Lompoc	934	.....	-.6%	West Hartford	62	.....	-.7%						
Birmingham	350-352	...	-.3%	Long Beach	907-908	...	.9%	<b>Delaware</b>	<b>3%</b>	Dover	199	.....	-.3%				
Dothan	363	.....	-.4%	Los Angeles	900-901	...	.8%	Newark	197	.....	.8%	Aliamanu	968	.....	.25%		
Evergreen	364	.....	-.12%	Marysville	959	.....	.1%	Wilmington	198	.....	.6%	Ewa	967	.....	.23%		
Gadsden	359	.....	-.12%	Modesto	953	.....	-.1%	<b>District of Columbia</b>	<b>13%</b>	Washington	200-205	...	.13%	Halawa Heights	967	.....	.23%
Huntsville	358	.....	-.4%	Mojave	935	.....	.5%	<b>Florida</b>	<b>-6%</b>	Altamonte Springs	327	.....	-.6%	Hilo	967	.....	.23%
Jasper	355	.....	-.10%	Novato	949	.....	.14%	Bradenton	342	.....	-.7%	Honolulu	968	.....	.25%		
Mobile	365-366	...	-.2%	Oakland	945-947	...	.18%	Brooksville	346	.....	-.8%	Kailua	968	.....	.25%		
Montgomery	360-361	...	-.4%	Orange	928	.....	.10%	Daytona Beach	321	.....	-.11%	Lualualei	967	.....	.23%		
Scottsboro	357	.....	-.7%	Oxnard	930	.....	.5%	Fort Lauderdale	333	.....	.0%	Mililani Town	967	.....	.23%		
Selma	367	.....	-.5%	Pasadena	910-912	...	.8%	Fort Myers	339	.....	-.9%	Pearl City	967	.....	.23%		
Sheffield	356	.....	-.1%	Rancho Cordova	956-957	...	.7%	Fort Pierce	349	.....	-.13%	Wahiawa	967	.....	.23%		
Tuscaloosa	354	.....	-.4%	Redding	960	.....	-.3%	Gainesville	326	.....	-.10%	Waianae	967	.....	.23%		
<b>Alaska</b> <b>20%</b>	Richmond	948	.....	.19%	Daytona Beach	321	.....	-.11%	Jacksonville	322	.....	-.3%	Wailuku (Maui)	967	.....	.23%	
Anchorage	995	.....	.25%	Riverside	925	.....	.4%	Lakeland	338	.....	-.8%	<b>Idaho</b>	<b>-8%</b>	Boise	837	.....	-.2%
Fairbanks	997	.....	.23%	Sacramento	958	.....	.6%	Melbourne	329	.....	-.10%	Coeur d'Alene	838	.....	-.10%		
Juneau	998	.....	.21%	Salinas	939	.....	.2%	Miami	330-332	...	-.1%	Idaho Falls	834	.....	-.8%		
Ketchikan	999	.....	.8%	San Bernardino	923-924	...	.2%	Naples	341	.....	-.4%	Lewiston	835	.....	-.10%		
King Salmon	996	.....	.22%	San Diego	919-921	...	.8%	Ocala	344	.....	-.12%	Meridian	836	.....	-.7%		
<b>Arizona</b> <b>-5%</b>	San Francisco	941	.....	.28%	Lakeland	338	.....	-.8%	Orlando	328	.....	-.1%	Pocatello	832	.....	-.7%	
Chambers	865	.....	-.5%	San Jose	901-951	...	.18%	Panama City	324	.....	-.3%	Sun Valley	833	.....	-.10%		
Douglas	855	.....	-.7%	San Mateo	943-944	...	.18%	Pensacola	325	.....	-.7%	<b>Illinois</b>	<b>5%</b>	Arlington Heights	600	.....	.15%
Flagstaff	860	.....	-.9%	Santa Barbara	931	.....	.7%	Saint Augustine	320	.....	-.6%	Aurora	605	.....	.15%		
Kingman	864	.....	-.5%	Santa Rosa	954	.....	.6%	Saint Cloud	347	.....	-.4%	Belleville	622	.....	.4%		
Mesa	852	.....	.1%	Stockton	952	.....	.1%	St. Petersburg	337	.....	-.6%	Bloomington	617	.....	.2%		
Phoenix	850	.....	.1%	Sunnyvale	940	.....	.19%	Tallahassee	323	.....	-.8%	Carbondale	629	.....	-.6%		
Prescott	863	.....	-.8%	Van Nuys	913-916	...	.8%	Tampa	335-336	...	-.1%	Carol Stream	601	.....	.15%		
Show Low	859	.....	-.10%	Whittier	906	.....	.8%	W. Palm Beach	334	.....	-.3%	Centralia	628	.....	-.4%		
Tucson	856-857	...	-.7%	<b>Colorado</b> <b>1%</b>	Aurora	800-801	...	.4%	<b>Georgia</b> <b>-5%</b>	Albany	317	.....	-.10%	Champaign	618	.....	.2%
Yuma	853	.....	.0%	Boulder	803-804	...	.1%	Athens	306	.....	-.7%	Chicago	606-608	...	.17%		
<b>Arkansas</b> <b>-7%</b>	Batesville	725	.....	-.11%	Colorado Springs	808-809	...	-.2%	Atlanta	303	.....	.12%	Decatur	623	.....	-.7%	
Camden	717	.....	-.6%	Denver	802	.....	.6%	Augusta	308-309	...	-.6%	Galesburg	614	.....	-.5%		
Fayetteville	727	.....	-.4%	Durango	813	.....	-.2%	Buford	305	.....	-.4%	Granite City	620	.....	.5%		
Fort Smith	729	.....	-.6%	Fort Morgan	807	.....	.1%	Calhoun	307	.....	-.10%	Green River	612	.....	.4%		
Harrison	726	.....	-.14%	Glenwood Springs	816	.....	.4%	Columbus	318-319	...	-.5%	Joliet	604	.....	.15%		
Hope	718	.....	.2%	Grand Junction	814-815	...	-.1%	Dublin/Fort Valley	310	.....	-.8%	Kankakee	609	.....	.0%		
Hot Springs	719	.....	-.14%	Greeley	806	.....	.3%	Hinesville	313	.....	-.6%	Lawrenceville	624	.....	-.4%		
Jonesboro	724	.....	-.8%	Longmont	805	.....	.3%	Kings Bay	315	.....	-.9%	Oak Park	603	.....	.19%		
Little Rock	720-722	...	-.3%	Pagosa Springs	811	.....	-.5%	Macon	312	.....	-.4%	Peoria	615-616	...	.5%		
Pine Bluff	716	.....	-.4%	Pueblo	810	.....	.3%	Marietta	300-302	...	.4%	Peru	613	.....	.7%		
Russellville	728	.....	-.5%	Salida	812	.....	-.5%	Savannah	314	.....	-.6%	Quincy	602	.....	.17%		
West Memphis	723	.....	-.6%	<b>Connecticut</b> <b>10%</b>	Bridgeport	66	.....	.10%	Statesboro	304	.....	-.11%	Rockford	610-611	...	.4%	
<b>California</b> <b>7%</b>	Alhambra	917-918	...	.8%	Bristol	60	.....	.12%	Valdosta	316	.....	-.4%	Springfield	625-627	...	-.1%	
Bakersfield	932-933	...	.2%	Fairfield	64	.....	.12%	<b>Indiana</b> <b>-1%</b>	Aurora	470	.....	-.2%	Urbana	619	.....	-.5%	
El Centro	922	.....	.1%	Hartford	61	.....	.10%	Bloomington	474	.....	-.2%	<b>Indiana</b> <b>-1%</b>	Evansville	476-477	...	.10%	
Eureka	955	.....	-.1%	New Haven	65	.....	.10%	Columbus	472	.....	-.4%						
Fresno	936-938	...	-.1%														

Fort Wayne	467-468	...	-3%	<b>Maine</b>			<b>-6%</b>	Meridian	393	.....	-8%	<b>New Mexico</b>			<b>-9%</b>
Gary	463-464	...	18%	Auburn	42	.....	-5%	Tupelo	388	.....	-10%	Alamogordo	883	.....	-10%
Indianapolis	460-462	...	5%	Augusta	43	.....	-6%	<b>Missouri</b>			<b>-4%</b>	Albuquerque	870-871	...	-3%
Jasper	475	.....	-7%	Bangor	44	.....	-8%	Cape Girardeau	637	.....	-5%	Clovis	881	.....	-13%
Jeffersonville	471	.....	-3%	Bath	45	.....	-5%	Caruthersville	638	.....	-11%	Farmington	874	.....	0%
Kokomo	469	.....	-8%	Brunswick	39-40	...	-2%	Chillicothe	646	.....	-9%	Fort Sumner	882	.....	-2%
Lafayette	479	.....	-5%	Camden	48	.....	-9%	Columbia	652	.....	-4%	Gallup	873	.....	-8%
Muncie	473	.....	-8%	Cutler	46	.....	-10%	East Lynne	647	.....	-6%	Holman	877	.....	-9%
South Bend	466	.....	-3%	Dexter	49	.....	-6%	Farmington	636	.....	-9%	Las Cruces	880	.....	-12%
Terre Haute	478	.....	-2%	Northern Area	47	.....	-10%	Hannibal	634	.....	-4%	Santa Fe	875	.....	-9%
<b>Iowa</b>			<b>-4%</b>	Portland	41	.....	1%	Independence	640	.....	5%	Socorro	878	.....	-15%
Burlington	526	.....	-3%	<b>Maryland</b>			<b>3%</b>	Jefferson City	650-651	...	-4%	Truth or Consequences	879	.....	-19%
Carroll	514	.....	-10%	Annapolis	214	.....	6%	Joplin	648	.....	-8%	Tucumcari	884	.....	-10%
Cedar Falls	506	.....	-3%	Baltimore	210-212	...	8%	Kansas City	641	.....	6%	<b>New York</b>			<b>9%</b>
Cedar Rapids	522-524	...	1%	Bethesda	208-209	...	14%	Kirksville	635	.....	-10%	Albany	120-123	...	10%
Cherokee	510	.....	-4%	Church Hill	216	.....	-4%	Knob Noster	653	.....	-5%	Amityville	117	.....	13%
Council Bluffs	515	.....	-6%	Cumberland	215	.....	-7%	Lebanon	654-655	...	-11%	Batavia	140	.....	1%
Creston	508	.....	-7%	Elkton	219	.....	3%	Poplar Bluff	639	.....	-6%	Binghamton	137-139	...	1%
Davenport	527-528	...	0%	Frederick	217	.....	3%	Saint Charles	633	.....	1%	Bronx	104	.....	16%
Decorah	521	.....	-4%	Laurel	206-207	...	9%	Saint Joseph	644-645	...	1%	Brooklyn	112	.....	12%
Des Moines	500-503	...	4%	Salisbury	218	.....	-4%	Springfield	656-658	...	-8%	Buffalo	142	.....	1%
Dubuque	520	.....	0%	<b>Massachusetts</b>			<b>12%</b>	St. Louis	630-631	...	5%	Elmira	149	.....	0%
Fort Dodge	505	.....	-4%	Ayer	015-016	...	8%	<b>Montana</b>			<b>-3%</b>	Flushing	113	.....	21%
Mason City	504	.....	-3%	Bedford	017	.....	18%	Billings	590-591	...	1%	Garden City	115	.....	19%
Ottumwa	525	.....	-6%	Boston	021-022	...	36%	Butte	597	.....	-4%	Hicksville	118	.....	17%
Sheldon	512	.....	-8%	Brockton	023-024	...	21%	Fairview	592	.....	0%	Ithaca	148	.....	-3%
Shenandoah	516	.....	-14%	Cape Cod	026	.....	2%	Great Falls	594	.....	-3%	Jamaica	114	.....	20%
Sioux City	511	.....	-1%	Chicopee	010	.....	7%	Havre	595	.....	-7%	Jamestown	147	.....	-4%
Spencer	513	.....	-7%	Dedham	019	.....	17%	Helena	596	.....	-2%	Kingston	124	.....	-3%
Waterloo	507	.....	-5%	Fitchburg	014	.....	13%	Kalispell	599	.....	-5%	Long Island	111	.....	35%
<b>Kansas</b>			<b>-7%</b>	Hingham	020	.....	20%	Miles City	593	.....	-2%	Montauk	119	.....	11%
Colby	677	.....	-11%	Lawrence	018	.....	16%	Missoula	598	.....	-5%	New York (Manhattan)	100-102	...	36%
Concordia	669	.....	-12%	Nantucket	025	.....	10%	<b>Nebraska</b>			<b>-9%</b>	New York City	100-102	...	36%
Dodge City	678	.....	-5%	New Bedford	027	.....	8%	Alliance	693	.....	-11%	Newcomb	128	.....	0%
Emporia	668	.....	-12%	Northfield	013	.....	1%	Columbus	686	.....	-6%	Niagara Falls	143	.....	-7%
Fort Scott	667	.....	-7%	Pittsfield	012	.....	1%	Grand Island	688	.....	-8%	Plattsburgh	129	.....	0%
Hays	676	.....	-14%	Springfield	011	.....	7%	Hastings	689	.....	-10%	Poughkeepsie	125-126	...	2%
Hutchinson	675	.....	-7%	<b>Michigan</b>			<b>1%</b>	Lincoln	683-685	...	-5%	Queens	110	.....	22%
Independence	673	.....	-2%	Battle Creek	490-491	...	0%	McCook	690	.....	-12%	Rochester	144-146	...	2%
Kansas City	660-662	...	5%	Detroit	481-482	...	11%	Norfolk	687	.....	-10%	Rockaway	116	.....	15%
Liberal	679	.....	-10%	Flint	484-485	...	-3%	North Platte	691	.....	-10%	Rome	133-134	...	-2%
Salina	674	.....	-7%	Grand Rapids	493-495	...	2%	Omaha	680-681	...	-2%	Staten Island	103	.....	12%
Topeka	664-666	...	-3%	Grayling	497	.....	-6%	Valentine	692	.....	-16%	Stewart	127	.....	-5%
Wichita	670-672	...	-5%	Jackson	492	.....	-2%	<b>Nevada</b>			<b>.6%</b>	Syracuse	130-132	...	2%
<b>Kentucky</b>			<b>-4%</b>	Lansing	488-489	...	1%	Carson City	897	.....	-3%	Tonawanda	141	.....	-1%
Ashland	411-412	...	-3%	Marquette	498-499	...	-1%	Elko	898	.....	30%	Utica	135	.....	-3%
Bowling Green	421	.....	-6%	Pontiac	483	.....	10%	Ely	893	.....	-2%	Watertown	136	.....	11%
Campton	413-414	...	-8%	Royal Oak	480	.....	9%	Fallon	894	.....	4%	West Point	109	.....	11%
Covington	410	.....	1%	Saginaw	486-487	...	-3%	Las Vegas	889-891	...	5%	White Plains	105-108	...	17%
Elizabethtown	427	.....	-8%	Traverse City	496	.....	0%	Reno	895	.....	2%	<b>North Carolina</b>			<b>-4%</b>
Frankfort	406	.....	-3%	<b>Minnesota</b>			<b>0%</b>	<b>New Hampshire</b>			<b>0%</b>	Asheville	287-289	...	-8%
Hazard	417-418	...	-5%	Bemidji	566	.....	-4%	Charlestown	036	.....	-4%	Charlotte	280-282	...	2%
Hopkinsville	422	.....	-6%	Brainerd	564	.....	-2%	Concord	034	.....	-1%	Durham	277	.....	1%
Lexington	403-405	...	1%	Duluth	556-558	...	0%	Dover	038	.....	3%	Elizabeth City	279	.....	-6%
London	407-409	...	-4%	Fergus Falls	565	.....	-7%	Lebanon	037	.....	-2%	Fayetteville	283	.....	-8%
Louisville	400-402	...	-1%	Magnolia	561	.....	-7%	Littleton	035	.....	-3%	Goldsboro	275	.....	-1%
Owensboro	423	.....	-2%	Mankato	560	.....	-3%	Manchester	032-033	...	2%	Greensboro	274	.....	-3%
Paducah	420	.....	-4%	Minneapolis	553-555	...	11%	New Boston	030-031	...	6%	Hickory	286	.....	-8%
Pikeville	415-416	...	-4%	Rochester	559	.....	-2%	<b>New Jersey</b>			<b>13%</b>	Kinston	285	.....	-10%
Somerset	425-426	...	-12%	St. Cloud	563	.....	6%	Atlantic City	080-084	...	9%	Raleigh	276	.....	1%
White Plains	424	.....	-4%	St. Paul	550-551	...	11%	Brick	087	.....	6%	Rocky Mount	278	.....	-7%
<b>Louisiana</b>			<b>0%</b>	Thief River Falls	567	.....	0%	Dover	078	.....	12%	Wilmington	284	.....	-1%
Alexandria	713-714	...	-6%	Willmar	562	.....	-2%	Edison	088-089	...	15%	Winston-Salem	270-273	...	-5%
Baton Rouge	707-708	...	10%	<b>Mississippi</b>			<b>-8%</b>	Hackensack	076	.....	14%	<b>North Dakota</b>			<b>2%</b>
Houma	703	.....	6%	Clarksdale	386	.....	-10%	Monmouth	077	.....	16%	Bismarck	585	.....	2%
Lafayette	705	.....	2%	Columbus	397	.....	-3%	Newark	071-073	...	14%	Dickinson	586	.....	9%
Lake Charles	706	.....	0%	Greenville	387	.....	-14%	Passaic	070	.....	15%	Fargo	580-581	...	2%
Mandeville	704	.....	0%	Greenwood	389	.....	-10%	Pateron	074-075	...	12%	Grand Forks	582	.....	0%
Minden	710	.....	-4%	Gulfport	395	.....	-4%	Princeton	085	.....	14%	Jamestown	584	.....	-3%
Monroe	712	.....	-7%	Jackson	390-392	...	-5%	Summit	079	.....	19%	Minot	587	.....	4%
New Orleans	700-701	...	5%	Laurel	394	.....	-6%	Trenton	086	.....	12%				
Shreveport	711	.....	-2%	McComb	396	.....	-9%								



Nekoma	583	.....	-9%	Punxsutawney	157	.....	-5%	Longview	756	.....	-3%	Huntington	255-257	...	-1%
Williston	588	.....	14%	Reading	195-196	...	2%	Lubbock	793-794	...	-8%	Lewisburg	249	.....	-15%
<b>Ohio</b>			<b>-1%</b>	Scranton	184-185	...	-2%	Lufkin	759	.....	-3%	Martinsburg	254	.....	-8%
Akron	442-443	...	0%	Somerset	155	.....	-8%	McAllen	785	.....	-14%	Morgantown	265	.....	-2%
Canton	446-447	...	-3%	Southeastern	193	.....	9%	Midland	797	.....	5%	New Martinsville	262	.....	-8%
Chillicothe	456	.....	-5%	Uniontown	154	.....	-5%	Palestine	758	.....	-6%	Parkersburg	261	.....	-1%
Cincinnati	450-452	...	3%	Valley Forge	194	.....	15%	Plano	750	.....	5%	Romney	267	.....	-7%
Cleveland	440-441	...	3%	Warminster	189	.....	11%	San Angelo	769	.....	-8%	Sugar Grove	268	.....	-12%
Columbus	432	.....	4%	Warrendale	150-151	...	8%	San Antonio	780-782	...	-2%	Wheeling	260	.....	-3%
Dayton	453-455	...	-3%	Washington	153	.....	9%	Texarkana	755	.....	-9%	<b>Wisconsin</b>			<b>0%</b>
Lima	458	.....	-5%	Wilkes Barre	186-187	...	-1%	Tyler	757	.....	-7%	Amery	540	.....	0%
Marietta	457	.....	-4%	Williamsport	177	.....	1%	Victoria	779	.....	-3%	Beloit	535	.....	4%
Marion	433	.....	-6%	York	173-174	...	0%	Waco	765-767	...	-6%	Clam Lake	545	.....	-8%
Newark	430-431	...	3%	<b>Rhode Island</b>			<b>6%</b>	Wichita Falls	763	.....	-9%	Eau Claire	547	.....	-1%
Sandusky	448-449	...	-1%	Bristol	28	.....	6%	Woodson	764	.....	-9%	Green Bay	541-543	...	1%
Steubenville	439	.....	-3%	Coventry	028	.....	6%	<b>Utah</b>			<b>-3%</b>	La Crosse	546	.....	-2%
Toledo	434-436	...	5%	Cranston	029	.....	7%	Clearfield	840	.....	0%	Ladysmith	548	.....	-5%
Warren	444	.....	-4%	Davisville	028	.....	6%	Green River	845	.....	0%	Madison	537	.....	8%
Youngstown	445	.....	-1%	Narragansett	028	.....	6%	Ogden	843-844	...	-7%	Milwaukee	530-534	...	7%
Zanesville	437-438	...	1%	Newport	028	.....	6%	Provo	846-847	...	-9%	Oshkosh	549	.....	1%
<b>Oklahoma</b>			<b>-7%</b>	Providence	029	.....	7%	Salt Lake City	841	.....	2%	Portage	539	.....	1%
Adams	739	.....	-10%	Warwick	028	.....	6%	<b>Vermont</b>			<b>-4%</b>	Prairie du Chien	538	.....	-5%
Ardmore	734	.....	-7%	<b>South Carolina</b>			<b>-5%</b>	Albany	058	.....	-5%	Wausau	544	.....	-3%
Clinton	736	.....	-7%	Aiken	298	.....	4%	Battleboro	053	.....	-3%	<b>Wyoming</b>			<b>-2%</b>
Durant	747	.....	-11%	Beaufort	299	.....	-8%	Beecher Falls	059	.....	-5%	Casper	826	.....	2%
Enid	737	.....	-8%	Charleston	294	.....	-3%	Bennington	052	.....	-7%	Cheyenne/ Laramie	820	.....	-5%
Lawton	735	.....	-8%	Columbia	290-292	...	-4%	Burlington	054	.....	3%	Gillette	827	.....	2%
McAlester	745	.....	-11%	Greenville	296	.....	-4%	Montpelier	056	.....	-3%	Powell	824	.....	-6%
Muskogee	744	.....	-12%	Myrtle Beach	295	.....	-9%	Rutland	057	.....	-7%	Rawlins	823	.....	0%
Norman	730	.....	-3%	Rock Hill	297	.....	-8%	Rutland	057	.....	-7%	Riverton	825	.....	-5%
Oklahoma City	731	.....	-2%	Spartanburg	293	.....	-7%	Springfield	051	.....	-5%	Rock Springs	829-831	...	3%
Ponca City	746	.....	-4%	<b>South Dakota</b>			<b>-6%</b>	White River Junction	050	.....	-4%	Sheridan	828	.....	-4%
Poteau	749	.....	-10%	Aberdeen	574	.....	-6%	<b>Virginia</b>			<b>-5%</b>	Wheatland	822	.....	-10%
Pryor	743	.....	-11%	Mitchell	573	.....	-7%	Abingdon	242	.....	-5%	<b>CANADIAN AREA MODIFIERS</b>			
Shawnee	748	.....	-10%	Mobridge	576	.....	-11%	Alexandria	220-223	...	13%	These figures assume an exchange rate of \$1.00 Canadian to \$1.00 U.S.			
Tulsa	740-741	...	-2%	Pierre	575	.....	-10%	Charlottesville	229	.....	-5%	<b>Alberta</b>			<b>16%</b>
Woodward	738	.....	2%	Rapid City	577	.....	-6%	Chesapeake	233	.....	-1%	Calgary	.....	17%	
<b>Oregon</b>			<b>-3%</b>	Sioux Falls	570-571	...	-1%	Culpeper	227	.....	-4%	Edmonton	.....	17%	
Adrian	979	.....	-8%	Watertown	572	.....	-6%	Farmville	239	.....	-12%	Fort McMurray	.....	14%	
Bend	977	.....	-6%	<b>Tennessee</b>			<b>-2%</b>	Fredericksburg	224-225	...	-5%	<b>British Columbia</b>			<b>10%</b>
Eugene	974	.....	-1%	Chattanooga	374	.....	2%	Galax	243	.....	-10%	Fraser Valley	.....	9%	
Grants Pass	975	.....	-5%	Clarksville	370	.....	2%	Harrisonburg	228	.....	-7%	Okanagan	.....	9%	
Klamath Falls	976	.....	-9%	Cleveland	373	.....	-1%	Lynchburg	245	.....	-9%	Vancouver	.....	11%	
Pendleton	978	.....	-3%	Columbia	384	.....	-7%	Norfolk	235-237	...	0%	<b>Manitoba</b>			<b>3%</b>
Portland	970-972	...	10%	Cookeville	385	.....	-7%	Petersburg	238	.....	-6%	North Manitoba	.....	3%	
Salem	973	.....	-3%	Jackson	383	.....	-2%	Radford	241	.....	-11%	South Manitoba	.....	3%	
<b>Pennsylvania</b>			<b>-1%</b>	Kingsport	376	.....	-4%	Reston	201	.....	10%	Selkirk	.....	3%	
Allentown	181	.....	4%	Knoxville	377-379	...	-1%	Richmond	232	.....	1%	Winnipeg	.....	3%	
Altoona	166	.....	-7%	McKenzie	382	.....	-9%	Roanoke	240	.....	-11%	<b>New Brunswick</b>			<b>-11%</b>
Beaver Springs	178	.....	-4%	Memphis	380-381	...	3%	Staunton	244	.....	-8%	Moncton	.....	-11%	
Bethlehem	180	.....	6%	Nashville	371-372	...	5%	Tazewell	246	.....	-8%	<b>Nova Scotia</b>			<b>-5%</b>
Bradford	167	.....	-6%	<b>Texas</b>			<b>-2%</b>	Virginia Beach	234	.....	-4%	Amherst	.....	-6%	
Butler	160	.....	0%	Abilene	795-796	...	-3%	Williamsburg	230-231	...	-4%	Nova Scotia	.....	-5%	
Chambersburg	172	.....	-7%	Amarillo	790-791	...	-3%	Winchester	226	.....	-7%	Sydney	.....	-6%	
Clearfield	168	.....	0%	Arlington	760	.....	0%	<b>Washington</b>			<b>0%</b>	<b>Newfoundland/ Labrador</b>			<b>-6%</b>
DuBois	158	.....	-9%	Austin	786-787	...	2%	Clarkston	994	.....	-9%	<b>Ontario</b>			<b>9%</b>
East Stroudsburg	183	.....	-3%	Bay City	774	.....	23%	Everett	982	.....	2%	London	.....	10%	
Erie	164-165	...	-6%	Beaumont	776-777	...	7%	Olympia	985	.....	-2%	Thunder Bay	.....	9%	
Genesee	169	.....	-2%	Brownwood	768	.....	-10%	Pasco	993	.....	4%	Toronto	.....	10%	
Greensburg	156	.....	-2%	Bryan	778	.....	-5%	Seattle	980-981	...	13%	<b>Quebec</b>			<b>2%</b>
Harrisburg	170-171	...	2%	Childress	792	.....	-16%	Spokane	990-992	...	-1%	Montreal	.....	2%	
Hazleton	182	.....	-3%	Corpus Christi	783-784	...	1%	Tacoma	983-984	...	2%	Quebec City	.....	2%	
Johnstown	159	.....	-9%	Dallas	751-753	...	4%	Vancouver	986	.....	2%	<b>Saskatchewan</b>			<b>6%</b>
Kittanning	162	.....	-7%	Del Rio	788	.....	-8%	Wenatchee	988	.....	-5%	La Ronge	.....	6%	
Lancaster	175-176	...	0%	El Paso	798-799	...	-12%	Yakima	989	.....	-4%	Prince Albert	.....	5%	
Meadville	163	.....	-12%	Fort Worth	761-762	...	-1%	<b>West Virginia</b>			<b>-5%</b>	Saskatoon	.....	8%	
Montrose	188	.....	-3%	Galveston	775	.....	8%	Beckley	258-259	...	-4%				
New Castle	161	.....	-3%	Giddings	789	.....	-4%	Bluefield	247-248	...	-1%				
Philadelphia	190-191	...	14%	Greenville	754	.....	2%	Charleston	250-253	...	6%				
Pittsburgh	152	.....	8%	Houston	770-772	...	10%	Clarksburg	263-264	...	-4%				
Pottsville	179	.....	-8%	Huntsville	773	.....	10%	Fairmont	266	.....	-11%				

# Crew Compositions & Wage Rates

Crew Code	Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
<b>AB</b>					
1 Air tool operator	8.00	\$33.39	\$267.10		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$499.50</b>	<b>\$31.22</b>	<b>\$45.89</b>
<b>AD</b>					
2 Air tool operators	16.00	\$33.39	\$534.21		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$766.61</b>	<b>\$31.94</b>	<b>\$46.95</b>
<b>BD</b>					
3 Bricklayers	24.00	\$36.80	\$883.20		
2 Bricktenders	16.00	\$27.09	\$433.44		
<b>TOTAL</b>	<b>40.00</b>		<b>\$1,316.64</b>	<b>\$32.92</b>	<b>\$48.72</b>
<b>BK</b>					
1 Bricklayer	8.00	\$36.80	\$294.40		
1 Bricktender	8.00	\$27.09	\$216.72		
<b>TOTAL</b>	<b>16.00</b>		<b>\$511.12</b>	<b>\$31.95</b>	<b>\$47.28</b>
<b>BO</b>					
2 Bricklayers	16.00	\$36.80	\$588.80		
2 Bricktenders	16.00	\$27.09	\$433.44		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,022.24</b>	<b>\$31.95</b>	<b>\$47.28</b>
<b>2C</b>					
2 Carpenters	16.00	\$36.01	\$576.16	\$36.01	\$53.65
<b>CA</b>					
1 Carpenter	8.00	\$36.01	\$288.08	\$36.01	\$53.65
<b>CH</b>					
1 Carpenter	8.00	\$36.01	\$288.08		
1/2 Laborer	4.00	\$29.05	\$116.20		
<b>TOTAL</b>	<b>12.00</b>		<b>\$404.28</b>	<b>\$33.69</b>	<b>\$50.20</b>
<b>CJ</b>					
1 Carpenter	8.00	\$36.01	\$288.08		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$520.48</b>	<b>\$32.53</b>	<b>\$48.47</b>
<b>CN</b>					
2 Carpenters	16.00	\$36.01	\$576.16		
1/2 Laborer	4.00	\$29.05	\$116.20		
<b>TOTAL</b>	<b>20.00</b>		<b>\$692.36</b>	<b>\$34.62</b>	<b>\$51.58</b>
<b>CS</b>					
2 Carpenters	16.00	\$36.01	\$576.16		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$808.56</b>	<b>\$33.69</b>	<b>\$50.20</b>
<b>CU</b>					
4 Carpenters	32.00	\$36.01	\$1,152.32		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>40.00</b>		<b>\$1,384.72</b>	<b>\$34.62</b>	<b>\$51.58</b>
<b>CW</b>					
2 Carpenters	16.00	\$36.01	\$576.16		
2 Laborers	16.00	\$29.05	\$464.80		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,040.96</b>	<b>\$32.53</b>	<b>\$48.47</b>

Crew Code	Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
<b>CX</b>					
4 Carpenters	32.00	\$36.01	\$1,152.32	\$36.01	\$53.65
<b>CY</b>					
3 Carpenters	24.00	\$36.01	\$864.24		
2 Laborers	16.00	\$29.05	\$464.80		
1 Equipment operator	8.00	\$40.74	\$325.92		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>56.00</b>		<b>\$1,887.36</b>	<b>\$33.70</b>	<b>\$50.22</b>
<b>CZ</b>					
4 Carpenters	32.00	\$36.01	\$1,152.32		
3 Laborers	24.00	\$29.05	\$697.20		
1 Equipment operator	8.00	\$40.74	\$325.92		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>72.00</b>		<b>\$2,407.84</b>	<b>\$33.44</b>	<b>\$49.83</b>
<b>DD</b>					
2 Cement masons	16.00	\$33.86	\$541.76		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$774.16</b>	<b>\$32.26</b>	<b>\$47.42</b>
<b>DF</b>					
3 Cement masons	24.00	\$33.86	\$812.64		
5 Laborers	40.00	\$29.05	\$1,162.00		
<b>TOTAL</b>	<b>64.00</b>		<b>\$1,974.64</b>	<b>\$30.85</b>	<b>\$45.36</b>
<b>EA</b>					
1 Electrician	8.00	\$39.05	\$312.40	\$39.05	\$56.62
<b>EB</b>					
2 Electricians	16.00	\$39.05	\$624.80	\$39.05	\$56.62
<b>ED</b>					
1 Electrician	8.00	\$39.05	\$312.40		
1 Carpenter	8.00	\$36.01	\$288.08		
<b>TOTAL</b>	<b>16.00</b>		<b>\$600.48</b>	<b>\$37.53</b>	<b>\$54.42</b>
<b>FA</b>					
1 Floorlayer	8.00	\$32.73	\$261.84	\$32.73	\$47.79
<b>FB</b>					
2 Floorlayers	16.00	\$32.73	\$523.68		
1/4 Laborer	2.00	\$29.05	\$58.10		
<b>TOTAL</b>	<b>18.00</b>		<b>\$581.78</b>	<b>\$32.32</b>	<b>\$47.19</b>
<b>FC</b>					
1 Floorlayer (hardwood)	8.00	\$34.36	\$274.90	\$34.36	\$50.17
<b>FD</b>					
2 Floorlayers (hardwood)	16.00	\$34.36	\$549.80		
1/4 Laborer	2.00	\$29.05	\$58.10		
<b>TOTAL</b>	<b>18.00</b>		<b>\$607.90</b>	<b>\$33.77</b>	<b>\$49.31</b>
<b>GA</b>					
1 Glazier	8.00	\$33.97	\$271.76	\$33.97	\$49.94
<b>GB</b>					
2 Glaziers	16.00	\$33.97	\$543.52	\$33.97	\$49.94
<b>GC</b>					
3 Glaziers	24.00	\$33.97	\$815.28	\$33.97	\$49.94
<b>HA</b>					
1 Fence erector	8.00	\$37.19	\$297.55	\$37.19	\$55.05
<b>HB</b>					
2 Fence erectors	16.00	\$37.19	\$595.10		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$827.50</b>	<b>\$34.48</b>	<b>\$51.03</b>

Crew Code	Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
<b>1L</b>					
1 Laborer	8.00	\$29.05	\$232.40	\$29.05	\$42.99
<b>LB</b>					
2 Laborers	16.00	\$29.05	\$464.80	\$29.05	\$42.99
<b>LC</b>					
2 Laborers	16.00	\$29.05	\$464.80		
1 Carpenter	8.00	\$36.01	\$288.08		
<b>TOTAL</b>	<b>24.00</b>		<b>\$752.88</b>	<b>\$31.37</b>	<b>\$46.43</b>
<b>LD</b>					
2 Laborers	16.00	\$29.05	\$464.80		
2 Carpenters	16.00	\$36.01	\$576.16		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,040.96</b>	<b>\$32.53</b>	<b>\$48.14</b>
<b>LG</b>					
5 Laborers	40.00	\$29.05	\$1,162.00		
1 Carpenter	8.00	\$36.01	\$288.08		
<b>TOTAL</b>	<b>48.00</b>		<b>\$1,450.08</b>	<b>\$30.21</b>	<b>\$44.71</b>
<b>LH</b>					
3 Laborers	24.00	\$29.05	\$697.20	\$29.05	\$42.99
<b>LJ</b>					
4 Laborers	32.00	\$29.05	\$929.60	\$29.05	\$42.99
<b>LK</b>					
2 Laborers	16.00	\$29.05	\$464.80		
2 Carpenters	16.00	\$36.01	\$576.16		
1 Equipment operator	8.00	\$40.74	\$325.92		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>48.00</b>		<b>\$1,599.28</b>	<b>\$33.32</b>	<b>\$49.31</b>
<b>LL</b>					
3 Laborers	24.00	\$29.05	\$697.20		
1 Carpenter	8.00	\$36.01	\$288.08		
1 Equipment operator	8.00	\$40.74	\$325.92		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>48.00</b>		<b>\$1,543.60</b>	<b>\$32.16</b>	<b>\$47.59</b>
<b>LR</b>					
1 Lather	8.00	\$34.90	\$279.20	\$34.90	\$51.65
<b>ML</b>					
2 Bricklayers	16.00	\$36.80	\$588.80		
1 Bricktender	8.00	\$27.09	\$216.72		
<b>TOTAL</b>	<b>24.00</b>		<b>\$805.52</b>	<b>\$33.56</b>	<b>\$49.67</b>
<b>NA</b>					
1 Painter (brush)	8.00	\$36.77	\$294.16	\$36.77	\$54.05
<b>NC</b>					
1 Painter (spray)	8.00	\$37.87	\$302.96	\$37.87	\$55.67
<b>P3</b>					
2 Plasterers	16.00	\$36.41	\$582.56		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$814.96</b>	<b>\$33.96</b>	<b>\$50.26</b>
<b>PE</b>					
3 Plasterers	24.00	\$36.41	\$873.84		
2 Laborers	16.00	\$29.05	\$464.80		
<b>TOTAL</b>	<b>40.00</b>		<b>\$1,338.64</b>	<b>\$33.47</b>	<b>\$49.53</b>
<b>QA</b>					
1 Paperhanger	8.00	\$38.60	\$308.81	\$38.60	\$56.74

Crew Code	Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
<b>2R</b>					
2 Roofers (composition)	16.00	\$40.43	\$646.88	\$40.43	\$62.26
<b>RG</b>					
2 Roofers (composition)	16.00	\$40.43	\$646.88		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$879.28</b>	<b>\$36.64</b>	<b>\$56.42</b>
<b>RJ</b>					
2 Roofers (wood shingles)	16.00	\$42.45	\$679.25	\$42.45	\$65.38
<b>RL</b>					
2 Roofers (composition)	16.00	\$40.43	\$646.88		
1/2 Laborer	4.00	\$29.05	\$116.20		
<b>TOTAL</b>	<b>20.00</b>		<b>\$763.08</b>	<b>\$38.15</b>	<b>\$58.76</b>
<b>RM</b>					
2 Roofers (wood shingles)	16.00	\$42.45	\$679.25		
1/2 Laborer	4.00	\$29.05	\$116.20		
<b>TOTAL</b>	<b>20.00</b>		<b>\$795.45</b>	<b>\$39.77</b>	<b>\$61.25</b>
<b>RQ</b>					
2 Roofers (wood shingles)	16.00	\$42.45	\$679.25		
7/8 Laborer	7.00	\$29.05	\$203.35		
<b>TOTAL</b>	<b>23.00</b>		<b>\$882.60</b>	<b>\$38.37</b>	<b>\$59.10</b>
<b>RS</b>					
1 Roofer (foreman)	8.00	\$44.46	\$355.65		
3 Roofers (pitch)	24.00	\$41.64	\$999.26		
2 Laborers	16.00	\$29.05	\$464.80		
<b>TOTAL</b>	<b>48.00</b>		<b>\$1,819.71</b>	<b>\$37.91</b>	<b>\$58.38</b>
<b>RT</b>					
2 Roofers (pitch)	16.00	\$41.64	\$666.17		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$898.57</b>	<b>\$37.44</b>	<b>\$57.66</b>
<b>SA</b>					
1 Plumber	8.00	\$41.27	\$330.16	\$41.27	\$60.25
<b>SB</b>					
1 Plumber	8.00	\$41.27	\$330.16		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$562.56</b>	<b>\$35.16</b>	<b>\$51.33</b>
<b>SC</b>					
1 Plumber	8.00	\$41.27	\$330.16		
1 Electrician	8.00	\$39.05	\$312.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$642.56</b>	<b>\$40.16</b>	<b>\$58.63</b>
<b>SD</b>					
1 Plumber	8.00	\$41.27	\$330.16		
1 Laborer	8.00	\$29.05	\$232.40		
1 Electrician	8.00	\$39.05	\$312.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$874.96</b>	<b>\$36.46</b>	<b>\$53.23</b>
<b>SE</b>					
2 Plumbers	16.00	\$41.27	\$660.32		
1 Laborer	8.00	\$29.05	\$232.40		
1 Electrician	8.00	\$39.05	\$312.40		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,205.12</b>	<b>\$37.66</b>	<b>\$54.98</b>
<b>SF</b>					
2 Plumbers	16.00	\$41.27	\$660.32		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$892.72</b>	<b>\$37.20</b>	<b>\$54.31</b>



Crew Code	Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
<b>SG</b>					
3 Plumbers	24.00	\$41.27	\$990.48		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,222.88</b>	<b>\$38.22</b>	<b>\$55.79</b>
<b>TB</b>					
1 Tile setter (ceramic)	8.00	\$33.64	\$269.12		
1 Tile setter's helper (ceramic)	8.00	\$25.85	\$206.77		
<b>TOTAL</b>	<b>16.00</b>		<b>\$475.89</b>	<b>\$29.74</b>	<b>\$43.43</b>
<b>UA</b>					
1 Sheet metal worker	8.00	\$40.43	\$323.44	\$40.43	\$59.43
<b>UB</b>					
2 Sheet metal workers	16.00	\$40.43	\$646.88	\$40.43	\$59.43
<b>UC</b>					
2 Sheet metal workers	16.00	\$40.43	\$646.88		
2 Laborers	16.00	\$29.05	\$464.80		
<b>TOTAL</b>	<b>32.00</b>		<b>\$1,111.68</b>	<b>\$34.74</b>	<b>\$51.07</b>
<b>UD</b>					
1 Sheet metal worker	8.00	\$40.43	\$323.44		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$555.84</b>	<b>\$34.74</b>	<b>\$51.07</b>
<b>UE</b>					
1 Sheet metal worker	8.00	\$40.43	\$323.44		
1 Laborer	8.00	\$29.05	\$232.40		
1/2 Electrician	4.00	\$39.05	\$156.20		
<b>TOTAL</b>	<b>20.00</b>		<b>\$712.04</b>	<b>\$35.60</b>	<b>\$52.33</b>
<b>UF</b>					
2 Sheet metal workers	16.00	\$40.43	\$646.88		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>24.00</b>		<b>\$879.28</b>	<b>\$36.64</b>	<b>\$53.86</b>
<b>VB</b>					
1 Equipment operator	8.00	\$40.74	\$325.92		
1 Laborer	8.00	\$29.05	\$232.40		
<b>TOTAL</b>	<b>16.00</b>		<b>\$558.32</b>	<b>\$34.90</b>	<b>\$51.30</b>

# Abbreviations Used in This Book

<b>ABS</b>	acrylonitrile butadiene styrene	<b>F.H.A.</b>	Federal Housing Administration	<b>PSI</b>	per square inch
<b>ACR</b>	average crew rate	<b>fl. oz.</b>	fluid ounce	<b>PVC</b>	polyvinyl chloride
<b>AGA</b>	American Gas Association	<b>flt</b>	flight	<b>Qt.</b>	quart
<b>AMP</b>	ampere	<b>ft.</b>	foot	<b>R.E.</b>	rounded edge
<b>Approx.</b>	approximately	<b>ga.</b>	gauge	<b>R/L</b>	random length
<b>ASME</b>	American Society of Mechanical Engineers	<b>gal</b>	gallon	<b>RS</b>	rapid start (lamps)
<b>auto.</b>	automatic	<b>galv.</b>	galvanized	<b>R/W/L</b>	random width and length
<b>Avg.</b>	average	<b>GFI</b>	ground fault interrupter	<b>S4S</b>	surfaced-four-sides
<b>Bdle.</b>	bundle	<b>GPH</b>	gallons per hour	<b>SF</b>	square foot
<b>BTU</b>	British thermal unit	<b>GPM</b>	gallons per minute	<b>SL</b>	slimline (lamps)
<b>BTUH</b>	British thermal unit per hour	<b>H</b>	height or high	<b>Sq.</b>	1 square or 100 square feet
<b>C</b>	100	<b>HP, hp</b>	horsepower	<b>S.S.B.</b>	single strength, B quality
<b>cc</b>	center to center or cubic centimeter	<b>Hr.</b>	hour	<b>std.</b>	standard
<b>CF</b>	cubic foot	<b>HVAC</b>	heating, ventilating, air conditioning	<b>SY</b>	square yard
<b>CFM</b>	cubic foot per minute	<b>i.d.</b>	inside diameter	<b>T</b>	thick
<b>CLF</b>	100 linear feet	<b>i.e.</b>	that is	<b>T&amp;G</b>	tongue and groove
<b>Const.</b>	construction	<b>Inst</b>	install	<b>U</b>	thermal conductivity
<b>Corr.</b>	corrugated	<b>I.P.S.</b>	iron pipe size	<b>U.I.</b>	united inches
<b>CSF</b>	100 square feet	<b>KD</b>	knocked down	<b>UL</b>	Underwriters Laboratories
<b>CSY</b>	100 square yards	<b>KW, kw</b>	kilowatts	<b>U.S.G.</b>	United States Gypsum
<b>Ctn</b>	carton	<b>L</b>	length or long	<b>VLF</b>	vertical linear feet
<b>CWT</b>	100 pounds	<b>lb, lbs.</b>	pound(s)	<b>W</b>	width or wide
<b>CY</b>	cubic yard	<b>LF</b>	linear feet	<b>yr.</b>	year
<b>Cu.</b>	cubic	<b>LS</b>	lump sum		
<b>d</b>	penny	<b>M</b>	1000		
<b>D</b>	deep or depth	<b>Mat'l</b>	material		
<b>Demo</b>	demolish	<b>Max.</b>	maximum		
<b>dia.</b>	diameter	<b>MBF</b>	1000 board feet		
<b>D.S.A.</b>	double strength, A grade	<b>MBHP</b>	1000 boiler horsepower		
<b>D.S.B.</b>	double strength, B grade	<b>Mi</b>	miles		
<b>Ea</b>	each	<b>Min.</b>	minimum		
<b>e.g.</b>	for example	<b>MSF</b>	1000 square feet		
<b>etc.</b>	et cetera	<b>O.B.</b>	opposed blade		
<b>exp.</b>	exposure	<b>oc</b>	on center		
<b>FAS</b>	First and Select grade	<b>o.d.</b>	outside dimension		
		<b>oz.</b>	ounce		
		<b>pcs.</b>	pieces		
		<b>pkg.</b>	package		

## Symbols

/	per
%	percent
"	inches
'	foot or feet
x	by
o	degree
#	number or pounds
\$	dollar
+/-	plus or minus

For crew abbreviations, please see Crew Compositions & Wage Rates chart, pages 15 to 19.

# Acoustical and insulating tile

## 1. Dimensions

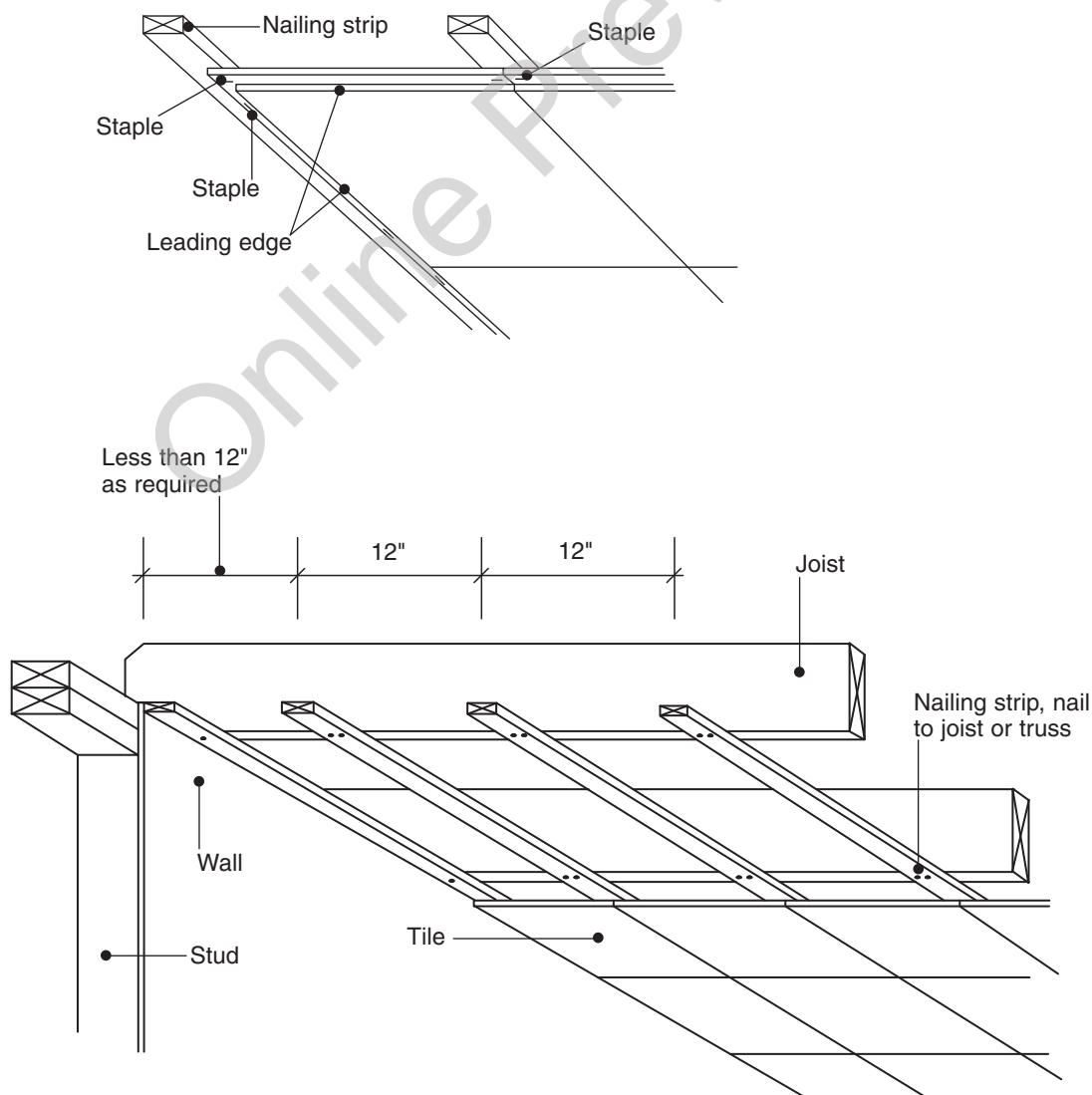
- a. Acoustical tile.  $\frac{1}{2}$ " thick x 12" x 12", 24".
- b. Insulating tile, decorative.  $\frac{1}{2}$ " thick x 12" x 12", 24";  $\frac{1}{2}$ " thick x 16" x 16", 32".

2. **Installation.** Tile may be applied to existing plaster (if joist spacing is suitable) or to wood furring strips. Tile may have a square edge or flange. Depending on the type and shape of the tile, you can use adhesive, staples, nails or clips to attach the tile.

3. **Estimating Technique.** Determine area and add 5 percent to 10 percent for waste.

4. **Notes on Material Pricing.** A material price of \$20.00 a gallon for adhesive was used to compile the Average Material Cost/Unit on the following pages. Here are the coverage rates:

12" x 12"	1.25 Gal/CSF
12" x 24"	0.95 Gal/CSF
16" x 16"	0.75 Gal/CSF
16" x 32"	0.55 Gal/CSF



Description	Oper	Unit	Vol	Crew Size	Man-hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
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## Acoustical treatment

See also *Suspended ceiling systems*, page 439

### Ceiling and wall tile

#### Adhesive set

Tile only, no grid system

Demo	SF	Lg	LB	.012	1300	---	.35	---	.35	.52
Demo	SF	Sm	LB	.018	910.0	---	.52	---	.52	.77

Tile on furring strips

Demo	SF	Lg	LB	.009	1710	---	.26	---	.26	.39
Demo	SF	Sm	LB	.013	1197	---	.38	---	.38	.56

#### Mineral fiber, vinyl coated, tile only

Applied in square pattern by adhesive to solid backing; 5% tile waste

1/2" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	.76	.65	---	1.41	1.84
	Inst	SF	Sm	2C	.026	616.0	.84	.94	---	1.78	2.36
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.43	.65	---	2.08	2.61
	Inst	SF	Sm	2C	.026	616.0	1.58	.94	---	2.52	3.21
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	1.97	.65	---	2.62	3.23
	Inst	SF	Sm	2C	.026	616.0	2.18	.94	---	3.12	3.90
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	2.37	.65	---	3.02	3.69
	Inst	SF	Sm	2C	.026	616.0	2.62	.94	---	3.56	4.41

5/8" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	.91	.65	---	1.56	2.01
	Inst	SF	Sm	2C	.026	616.0	1.01	.94	---	1.95	2.56
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.75	.65	---	2.40	2.98
	Inst	SF	Sm	2C	.026	616.0	1.93	.94	---	2.87	3.61
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.43	.65	---	3.08	3.76
	Inst	SF	Sm	2C	.026	616.0	2.68	.94	---	3.62	4.48
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	2.92	.65	---	3.57	4.32
	Inst	SF	Sm	2C	.026	616.0	3.23	.94	---	4.17	5.11

3/4" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	1.01	.65	---	1.66	2.13
	Inst	SF	Sm	2C	.026	616.0	1.11	.94	---	2.05	2.67
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.94	.65	---	2.59	3.20
	Inst	SF	Sm	2C	.026	616.0	2.14	.94	---	3.08	3.86
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.70	.65	---	3.35	4.07
	Inst	SF	Sm	2C	.026	616.0	2.98	.94	---	3.92	4.82
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	3.25	.65	---	3.90	4.70
	Inst	SF	Sm	2C	.026	616.0	3.60	.94	---	4.54	5.53

Applied by adhesive to furring strips ADD

	Inst	SF	Lg	2C	.002	---	---	.07	---	.07	.11
	Inst	SF	Sm	2C	.002	---	---	.07	---	.07	.11

Description	Oper	Unit	Vol	Crew Size	Man- hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
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**Stapled**

Tile only, no grid system	Demo	SF	Lg	LB	.014	1170	---	.41	---	.41	.60
	Demo	SF	Sm	LB	.020	819	---	.58	---	.58	.86
Tile on furring strips	Demo	SF	Lg	LB	.010	1540	---	.29	---	.29	.43
	Demo	SF	Sm	LB	.015	1078	---	.44	---	.44	.64

**Mineral fiber, vinyl coated, tile only**

Applied in square pattern by staples, nails, or clips; 5% tile waste

1/2" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	.65	.61	---	1.26	1.66
	Inst	SF	Sm	2C	.024	672.0	.72	.86	---	1.58	2.12
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.32	.61	---	1.93	2.43
	Inst	SF	Sm	2C	.024	672.0	1.46	.86	---	2.32	2.97
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	1.86	.61	---	2.47	3.05
	Inst	SF	Sm	2C	.024	672.0	2.06	.86	---	2.92	3.66
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	2.26	.61	---	2.87	3.51
	Inst	SF	Sm	2C	.024	672.0	2.50	.86	---	3.36	4.16

5/8" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	.80	.61	---	1.41	1.83
	Inst	SF	Sm	2C	.024	672.0	.88	.86	---	1.74	2.30
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.64	.61	---	2.25	2.80
	Inst	SF	Sm	2C	.024	672.0	1.81	.86	---	2.67	3.37
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.31	.61	---	2.92	3.57
	Inst	SF	Sm	2C	.024	672.0	2.56	.86	---	3.42	4.23
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	2.81	.61	---	3.42	4.14
	Inst	SF	Sm	2C	.024	672.0	3.11	.86	---	3.97	4.86

3/4" thick, 12" x 12" or 12" x 24"

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	.89	.61	---	1.50	1.94
	Inst	SF	Sm	2C	.024	672.0	.99	.86	---	1.85	2.43
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.82	.61	---	2.43	3.01
	Inst	SF	Sm	2C	.024	672.0	2.02	.86	---	2.88	3.61
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.59	.61	---	3.20	3.89
	Inst	SF	Sm	2C	.024	672.0	2.86	.86	---	3.72	4.58
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	3.14	.61	---	3.75	4.52
	Inst	SF	Sm	2C	.024	672.0	3.47	.86	---	4.33	5.28

Applied by staples, nails or clips to furring strips ADD

	Inst	SF	Lg	2C	.017	960.0	---	.61	---	.61	.91
	Inst	SF	Sm	2C	.024	672.0	---	.86	---	.86	1.29

**Tile patterns, effect on labor**

Herringbone, Increase manhours

	Inst	%	Lg	2C	25.0	---	---	---	---	---	---
	Inst	%	Sm	2C	25.0	---	---	---	---	---	---
Diagonal, Increase manhours	Inst	%	Lg	2C	20.0	---	---	---	---	---	---
	Inst	%	Sm	2C	20.0	---	---	---	---	---	---
Ashlar, Increase manhours	Inst	%	Lg	2C	30.0	---	---	---	---	---	---
	Inst	%	Sm	2C	30.0	---	---	---	---	---	---



Description	Oper	Unit	Vol	Crew Size	Man-hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
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## Furring strips, 8% waste included

Over wood

1" x 4", 12" oc	Inst	SF	Lg	2C	.010	1600	.26	.36	---	.62	.84
	Inst	SF	Sm	2C	.014	1120	.29	.50	---	.79	1.08
1" x 4", 16" oc	Inst	SF	Lg	2C	.008	1920	.23	.29	---	.52	.69
	Inst	SF	Sm	2C	.012	1344	.25	.43	---	.68	.93

Over plaster

1" x 4", 12" oc	Inst	SF	Lg	2C	.013	1280	.26	.47	---	.73	1.00
	Inst	SF	Sm	2C	.018	896	.29	.65	---	.94	1.30
1" x 4", 16" oc	Inst	SF	Lg	2C	.010	1600	.23	.36	---	.59	.80
	Inst	SF	Sm	2C	.014	1120	.25	.50	---	.75	1.04

## Adhesives

*Better quality, gun-applied in continuous bead to wood or metal framing or furring members.*

*Per 100 SF of surface area including 6% waste.*

### Panel adhesives

#### Subfloor adhesive, on floors

12" oc members

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	3.84	2.70	---	6.54	8.32
	Inst	CSF	Sm	CA	.101	79.50	4.25	3.64	---	7.89	10.20
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	15.30	2.70	---	18.00	21.20
	Inst	CSF	Sm	CA	.101	79.50	16.90	3.64	---	20.54	24.40
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	34.50	2.70	---	37.20	42.70
	Inst	CSF	Sm	CA	.101	79.50	38.20	3.64	---	41.84	48.20
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	61.10	2.70	---	63.80	72.40
	Inst	CSF	Sm	CA	.101	79.50	67.60	3.64	---	71.24	81.10

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	3.07	2.02	---	5.09	6.44
	Inst	CSF	Sm	CA	.075	107.3	3.40	2.70	---	6.10	7.83
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	12.20	2.02	---	14.22	16.70
	Inst	CSF	Sm	CA	.075	107.3	13.50	2.70	---	16.20	19.20
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	27.60	2.02	---	29.62	33.90
	Inst	CSF	Sm	CA	.075	107.3	30.60	2.70	---	33.30	38.30
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	48.90	2.02	---	50.92	57.70
	Inst	CSF	Sm	CA	.075	107.3	54.10	2.70	---	56.80	64.60

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	2.30	1.87	---	4.17	5.37
	Inst	CSF	Sm	CA	.069	115.5	2.55	2.48	---	5.03	6.56
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	9.18	1.87	---	11.05	13.10
	Inst	CSF	Sm	CA	.069	115.5	10.20	2.48	---	12.68	15.10
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	20.70	1.87	---	22.57	26.00
	Inst	CSF	Sm	CA	.069	115.5	22.90	2.48	---	25.38	29.40
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	36.70	1.87	---	38.57	43.80
	Inst	CSF	Sm	CA	.069	115.5	40.60	2.48	---	43.08	49.10

Description	Oper	Unit	Vol	Crew Size	Man- hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
<b>Wall sheathing or shear panel wall adhesive on walls, floors or ceilings</b>											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.32	3.60	---	6.92	9.08
	Inst	CSF	Sm	CA	.133	60.00	3.67	4.79	---	8.46	11.30
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	13.20	3.60	---	16.80	20.20
	Inst	CSF	Sm	CA	.133	60.00	14.60	4.79	---	19.39	23.50
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	29.80	3.60	---	33.40	38.70
	Inst	CSF	Sm	CA	.133	60.00	33.00	4.79	---	37.79	44.10
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	52.70	3.60	---	56.30	64.40
	Inst	CSF	Sm	CA	.133	60.00	58.30	4.79	---	63.09	72.40
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	2.65	3.28	---	5.93	7.85
	Inst	CSF	Sm	CA	.121	66.00	2.93	4.36	---	7.29	9.77
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	10.60	3.28	---	13.88	16.70
	Inst	CSF	Sm	CA	.121	66.00	11.70	4.36	---	16.06	19.60
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	23.80	3.28	---	27.08	31.60
	Inst	CSF	Sm	CA	.121	66.00	26.40	4.36	---	30.76	36.00
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	42.20	3.28	---	45.48	52.10
	Inst	CSF	Sm	CA	.121	66.00	46.60	4.36	---	50.96	58.70
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.99	3.02	---	5.01	6.74
	Inst	CSF	Sm	CA	.112	71.25	2.20	4.03	---	6.23	8.47
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	7.92	3.02	---	10.94	13.40
	Inst	CSF	Sm	CA	.112	71.25	8.77	4.03	---	12.80	15.80
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	17.90	3.02	---	20.92	24.50
	Inst	CSF	Sm	CA	.112	71.25	19.80	4.03	---	23.83	28.20
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	31.60	3.02	---	34.62	39.90
	Inst	CSF	Sm	CA	.112	71.25	35.00	4.03	---	39.03	45.20
<b>Polystyrene or polyurethane foam panel adhesive, on walls</b>											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	4.27	3.60	---	7.87	10.20
	Inst	CSF	Sm	CA	.133	60.00	4.72	4.79	---	9.51	12.40
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	17.00	3.60	---	20.60	24.40
	Inst	CSF	Sm	CA	.133	60.00	18.80	4.79	---	23.59	28.20
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	38.30	3.60	---	41.90	48.30
	Inst	CSF	Sm	CA	.133	60.00	42.40	4.79	---	47.19	54.70
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	67.90	3.60	---	71.50	81.40
	Inst	CSF	Sm	CA	.133	60.00	75.10	4.79	---	79.89	91.20
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.41	3.28	---	6.69	8.70
	Inst	CSF	Sm	CA	.121	66.00	3.78	4.36	---	8.14	10.70
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	13.60	3.28	---	16.88	20.10
	Inst	CSF	Sm	CA	.121	66.00	15.10	4.36	---	19.46	23.40
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	30.70	3.28	---	33.98	39.20
	Inst	CSF	Sm	CA	.121	66.00	34.00	4.36	---	38.36	44.50
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	54.30	3.28	---	57.58	65.70
	Inst	CSF	Sm	CA	.121	66.00	60.10	4.36	---	64.46	73.80

Description	Oper	Unit	Vol	Crew Size	Man-hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
<b>24" oc members</b>											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.56	3.02	---	5.58	<b>7.37</b>
	Inst	CSF	Sm	CA	.129	62.00	2.83	4.65	---	7.48	<b>10.10</b>
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	10.20	3.02	---	13.22	<b>15.90</b>
	Inst	CSF	Sm	CA	.129	62.00	11.30	4.65	---	15.95	<b>19.60</b>
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	23.00	3.02	---	26.02	<b>30.30</b>
	Inst	CSF	Sm	CA	.129	62.00	25.50	4.65	---	30.15	<b>35.40</b>
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	40.70	3.02	---	43.72	<b>50.10</b>
	Inst	CSF	Sm	CA	.129	62.00	45.00	4.65	---	49.65	<b>57.40</b>
<b>Gypsum drywall adhesive, on ceilings</b>											
<b>12" oc members</b>											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	1.98	3.60	---	5.58	<b>7.58</b>
	Inst	CSF	Sm	CA	.133	60.00	2.19	4.79	---	6.98	<b>9.59</b>
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	7.91	3.60	---	11.51	<b>14.20</b>
	Inst	CSF	Sm	CA	.133	60.00	8.76	4.79	---	13.55	<b>17.00</b>
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	17.90	3.60	---	21.50	<b>25.40</b>
	Inst	CSF	Sm	CA	.133	60.00	19.80	4.79	---	24.59	<b>29.30</b>
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	31.60	3.60	---	35.20	<b>40.80</b>
	Inst	CSF	Sm	CA	.133	60.00	35.00	4.79	---	39.79	<b>46.30</b>
<b>16" oc members</b>											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	1.59	3.28	---	4.87	<b>6.66</b>
	Inst	CSF	Sm	CA	.121	66.00	1.76	4.36	---	6.12	<b>8.46</b>
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	6.33	3.28	---	9.61	<b>12.00</b>
	Inst	CSF	Sm	CA	.121	66.00	7.00	4.36	---	11.36	<b>14.30</b>
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	14.30	3.28	---	17.58	<b>20.90</b>
	Inst	CSF	Sm	CA	.121	66.00	15.80	4.36	---	20.16	<b>24.20</b>
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	25.30	3.28	---	28.58	<b>33.20</b>
	Inst	CSF	Sm	CA	.121	66.00	28.00	4.36	---	32.36	<b>37.80</b>
<b>24" oc members</b>											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.19	3.02	---	4.21	<b>5.84</b>
	Inst	CSF	Sm	CA	.112	71.25	1.32	4.03	---	5.35	<b>7.49</b>
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	4.75	3.02	---	7.77	<b>9.83</b>
	Inst	CSF	Sm	CA	.112	71.25	5.25	4.03	---	9.28	<b>11.90</b>
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	10.70	3.02	---	13.72	<b>16.50</b>
	Inst	CSF	Sm	CA	.112	71.25	11.90	4.03	---	15.93	<b>19.30</b>
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	19.00	3.02	---	22.02	<b>25.70</b>
	Inst	CSF	Sm	CA	.112	71.25	21.00	4.03	---	25.03	<b>29.50</b>
<b>Gypsum drywall adhesive, on walls</b>											
<b>12" oc members</b>											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	1.98	3.60	---	5.58	<b>7.58</b>
	Inst	CSF	Sm	CA	.133	60.00	2.19	4.79	---	6.98	<b>9.59</b>
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	7.91	3.60	---	11.51	<b>14.20</b>
	Inst	CSF	Sm	CA	.133	60.00	8.76	4.79	---	13.55	<b>17.00</b>
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	17.90	3.60	---	21.50	<b>25.40</b>
	Inst	CSF	Sm	CA	.133	60.00	19.80	4.79	---	24.59	<b>29.30</b>
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	31.60	3.60	---	35.20	<b>40.80</b>
	Inst	CSF	Sm	CA	.133	60.00	35.00	4.79	---	39.79	<b>46.30</b>

Description	Oper	Unit	Vol	Crew Size	Man- hours per Unit	Crew Output per Day	Avg Mat'l Unit Cost	Avg Labor Unit Cost	Avg Equip Unit Cost	Avg Total Unit Cost	Avg Price Incl O&P
<b>16" oc members</b>											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	1.59	3.28	---	4.87	<b>6.66</b>
	Inst	CSF	Sm	CA	.121	66.00	1.76	4.36	---	6.12	<b>8.46</b>
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	6.33	3.28	---	9.61	<b>12.00</b>
	Inst	CSF	Sm	CA	.121	66.00	7.00	4.36	---	11.36	<b>14.30</b>
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	14.30	3.28	---	17.58	<b>20.90</b>
	Inst	CSF	Sm	CA	.121	66.00	15.80	4.36	---	20.16	<b>24.20</b>
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	25.30	3.28	---	28.58	<b>33.20</b>
	Inst	CSF	Sm	CA	.121	66.00	28.00	4.36	---	32.36	<b>37.80</b>
<b>24" oc members</b>											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.19	3.02	---	4.21	<b>5.84</b>
	Inst	CSF	Sm	CA	.112	71.25	1.32	4.03	---	5.35	<b>7.49</b>
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	4.75	3.02	---	7.77	<b>9.83</b>
	Inst	CSF	Sm	CA	.112	71.25	5.25	4.03	---	9.28	<b>11.90</b>
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	10.70	3.02	---	13.72	<b>16.50</b>
	Inst	CSF	Sm	CA	.112	71.25	11.90	4.03	---	15.93	<b>19.30</b>
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	19.00	3.02	---	22.02	<b>25.70</b>
	Inst	CSF	Sm	CA	.112	71.25	21.00	4.03	---	25.03	<b>29.50</b>
<b>Hardboard or plastic panel adhesive, on walls</b>											
<b>12" oc members</b>											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.74	3.60	---	7.34	<b>9.55</b>
	Inst	CSF	Sm	CA	.133	60.00	4.14	4.79	---	8.93	<b>11.80</b>
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	14.90	3.60	---	18.50	<b>22.10</b>
	Inst	CSF	Sm	CA	.133	60.00	16.50	4.79	---	21.29	<b>25.60</b>
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	33.60	3.60	---	37.20	<b>43.00</b>
	Inst	CSF	Sm	CA	.133	60.00	37.20	4.79	---	41.99	<b>48.80</b>
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	59.50	3.60	---	63.10	<b>72.00</b>
	Inst	CSF	Sm	CA	.133	60.00	65.80	4.79	---	70.59	<b>80.80</b>
<b>16" oc members</b>											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	2.99	3.28	---	6.27	<b>8.23</b>
	Inst	CSF	Sm	CA	.121	66.00	3.31	4.36	---	7.67	<b>10.20</b>
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	11.90	3.28	---	15.18	<b>18.20</b>
	Inst	CSF	Sm	CA	.121	66.00	13.20	4.36	---	17.56	<b>21.30</b>
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	26.90	3.28	---	30.18	<b>35.00</b>
	Inst	CSF	Sm	CA	.121	66.00	29.70	4.36	---	34.06	<b>39.80</b>
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	47.60	3.28	---	50.88	<b>58.20</b>
	Inst	CSF	Sm	CA	.121	66.00	52.60	4.36	---	56.96	<b>65.50</b>
<b>24" oc members</b>											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.25	3.02	---	5.27	<b>7.03</b>
	Inst	CSF	Sm	CA	.112	71.25	2.49	4.03	---	6.52	<b>8.80</b>
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	8.94	3.02	---	11.96	<b>14.50</b>
	Inst	CSF	Sm	CA	.112	71.25	9.89	4.03	---	13.92	<b>17.10</b>
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	20.20	3.02	---	23.22	<b>27.10</b>
	Inst	CSF	Sm	CA	.112	71.25	22.30	4.03	---	26.33	<b>31.00</b>
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	35.70	3.02	---	38.72	<b>44.50</b>
	Inst	CSF	Sm	CA	.112	71.25	39.50	4.03	---	43.53	<b>50.20</b>

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## A

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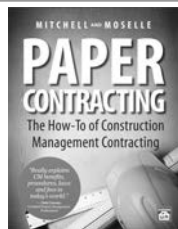
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