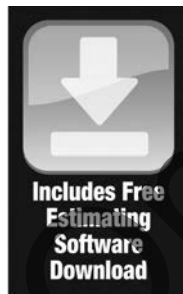




2021 NATIONAL REPAIR & REMODELING ESTIMATOR

by **Albert S. Paxton**

Includes inside the back cover:



Inside the back cover of this book you'll find a software download certificate. To access the download, follow the instructions printed there. The download includes the National Estimator, an easy-to-use estimating program with all the cost estimates in this book. The software will run on PCs using Windows XP, Vista, 7, 8, or 10 operating systems.

Quarterly price updates on the Web are free and automatic all during 2021. You'll be prompted when it's time to collect the next update. A connection to the Web is required.

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Preface

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

This book has over 12,000 cost estimates for 2021. 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 39th edition of the National Repair & Remodeling Estimator. Our appreciation is extended to those listed below.

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Wood Mode Cabinets
Transit Mixed Concrete
U.S. Gypsum Products
Henry Roofing Products

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About the Author

Albert Paxton is a Project Director at *Unified Building Sciences, Inc. (UBS)* (www.UnifiedGroup.com), located in Dallas, Texas.

Mr. Paxton (ALP@UnifiedGroup.com) is a California licensed General Contractor (B1-425946) and a Certified Professional Estimator with the *American Society of Professional Estimators*. The UBS staff is comprised of estimators, engineers and project managers who are also expert witnesses, building appraisers and arbitrators operating throughout the United States.

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

The expertise of UBS is in both new and repair/remodel work, for both residential and commercial construction. In addition to daily claims involving individual structures, UBS assignments have included natural disasters such as the 2004 Hurricanes Charley, Frances, Ivan and Jeanne, striking Florida and the southeastern states, the catastrophic Hurricane Katrina (2005), the Texas Hurricanes Dolly (2008) and Ike (2008), the cleanup, repair and rebuilding of the massive destruction of Superstorms Sandy (2012), and, more recently, Hurricanes Matthew (2016), Harvey and Irma (2017), Michael (2018), and Sally and Zeta, both 2020.

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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

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 and every business entity works to make a fair and reasonable profit. An office, even in your home, costs

money to operate. If family members help out, pay them. Everyone's time is valuable!

If you expect there will be a supervising general contractor on the job, and the overhead and profit is computed as a percentage of the job, then overhead and profit dollars automatically adjust to the job size and the job complexity.

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 a software download certificate. To access the download, follow the instructions printed there. The download includes the *National Estimator*, an easy-to-use estimating program with all the cost estimates in this book. The software will run on PCs using Windows XP, Vista, 7, 8, or 10 operating systems. When the *National Estimator* program has been installed, click Help on the menu bar to see a list of topics that will get you up and running. Or, go online to www.craftsman-book.com, click on "Support," then "Tutorials" to view an interactive video for *National Estimator*.

Building Repair Estimate

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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.
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.
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. 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.

[illegible]

Wage Rates Used in This Book

Wage rates listed here and used in this book were compiled in the fall of 2020 and projected to mid-2021. 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 5.48% 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 (0.60%), Social Security and Medicare tax (7.65%), liability

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 4.84% 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 (5.53% of Base Wage)	3 Liability Insurance & Employer Taxes %	4 \$	5 Non-Taxable Fringe Benefits (4.88% of Base Wage)	6 Total Hourly Cost Used in This Book
Air Tool Operator	\$32.01	\$1.78	25.83%	\$8.73	\$1.57	\$44.09
Bricklayer or Stone Mason	\$27.76	\$1.54	24.94%	\$7.31	\$1.36	\$37.97
Bricktender	\$20.58	\$1.14	24.94%	\$5.42	\$1.01	\$28.15
Carpenter	\$26.11	\$1.45	30.97%	\$8.54	\$1.28	\$37.38
Cement Mason	\$26.40	\$1.47	22.89%	\$6.38	\$1.30	\$35.55
Drywall Installer	\$27.02	\$1.50	23.22%	\$6.62	\$1.33	\$36.47
Drywall Taper	\$27.11	\$1.51	23.22%	\$6.65	\$1.33	\$36.60
Electrician, Journeyman Wireman	\$30.97	\$1.72	19.65%	\$6.42	\$1.52	\$40.63
Equipment Operator	\$31.25	\$1.74	24.83%	\$8.19	\$1.53	\$42.71
Fence Erector	\$28.06	\$1.56	25.62%	\$7.59	\$1.38	\$38.59
Floor Layer: Carpet, Linoleum, Soft Tile	\$25.34	\$1.41	23.52%	\$6.29	\$1.24	\$34.28
Floor Layer: Hardwood	\$26.47	\$1.47	23.52%	\$6.57	\$1.30	\$35.81
Glazier	\$26.34	\$1.46	25.34%	\$7.04	\$1.29	\$36.13
Laborer, General Construction	\$21.00	\$1.17	32.07%	\$7.11	\$1.03	\$30.31
Lather	\$27.11	\$1.51	21.05%	\$6.02	\$1.33	\$35.97
Marble Setter	\$25.06	\$1.39	21.13%	\$5.59	\$1.23	\$33.27
Millwright / Finish Carpenter	\$26.56	\$1.48	21.02%	\$5.89	\$1.30	\$35.23
Mosaic & Terrazzo Setter	\$26.62	\$1.48	21.13%	\$5.94	\$1.31	\$35.35
Mosaic & Terrazzo Setter Helper	\$20.26	\$1.13	21.13%	\$4.52	\$1.00	\$26.91
Painter, Brush	\$28.02	\$1.56	24.55%	\$7.26	\$1.38	\$38.22
Painter, Spray-Gun	\$28.72	\$1.60	24.55%	\$7.44	\$1.41	\$39.17
Paperhanger	\$29.27	\$1.63	24.55%	\$7.59	\$1.44	\$39.93
Plasterer	\$26.74	\$1.49	28.05%	\$7.92	\$1.31	\$37.46
Plasterer Helper	\$20.98	\$1.17	28.05%	\$6.21	\$1.03	\$29.39
Plumber	\$32.01	\$1.78	24.00%	\$8.11	\$1.57	\$43.47
Reinforcing Ironworker	\$28.06	\$1.56	28.12%	\$8.33	\$1.38	\$39.33
Roofer, Foreman	\$29.25	\$1.63	43.00%	\$13.28	\$1.44	\$45.60
Roofer, Journeyman	\$26.73	\$1.49	43.00%	\$12.13	\$1.31	\$41.66
Roofer, Hot Mop Pitch	\$27.39	\$1.52	43.00%	\$12.43	\$1.35	\$42.69
Roofer, Wood Shingles	\$27.92	\$1.55	43.00%	\$12.67	\$1.37	\$43.51
Sheet Metal Worker	\$30.66	\$1.70	25.62%	\$8.29	\$1.51	\$42.16
Tile Setter	\$26.86	\$1.49	21.13%	\$5.99	\$1.32	\$35.66
Tile Setter's Helper	\$20.26	\$1.13	21.13%	\$4.52	\$1.00	\$26.91
Truck Driver	\$22.60	\$1.26	25.83%	\$6.16	\$1.11	\$31.13

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.

Alabama Average	-4%	Herlong	961.....9%
Anniston	362.....-6%	Inglewood	902-905.....9%
Auburn	368.....-4%	Irvine	926-927.....13%
Bellamy	369.....-5%	Lompoc	934.....-3%
Birmingham	350-352.....2%	Long Beach	907-908.....9%
Dothan	363.....-7%	Los Angeles	900-901.....8%
Evergreen	364.....-10%	Marysville	959.....9%
Gadsden	359.....-9%	Modesto	953.....1%
Huntsville	358.....-1%	Mojave	935.....5%
Jasper	355.....-8%	Novato	949.....18%
Mobile	365-366.....-2%	Oakland	945-947.....24%
Montgomery	360-361.....-2%	Orange	928.....12%
Scottsboro	357.....-4%	Oxnard	930.....2%
Selma	367.....-5%	Pasadena	910-912.....9%
Sheffield	356.....0%	Rancho	
Tuscaloosa	354.....-4%	Cordova	956-957.....4%
Alaska Average	23%	Redding	960.....-3%
Anchorage	995.....26%	Richmond	948.....17%
Fairbanks	997.....27%	Riverside	925.....-4%
Juneau	998.....19%	Sacramento	958.....-3%
Ketchikan	999.....18%	Salinas	939.....1%
King Salmon	996.....23%	San Bernardino	923-924.....2%
Arizona Average	-4%	San Diego	919-921.....8%
Chambers	865.....-8%	San Francisco	941.....27%
Douglas	855.....-8%	San Jose	950-951.....17%
Flagstaff	860.....-7%	San Mateo	943-944.....21%
Kingman	864.....-5%	Santa Barbara	931.....7%
Mesa	852.....3%	Santa Rosa	954.....16%
Phoenix	850.....3%	Stockton	952.....-4%
Prescott	863.....-6%	Sunnyvale	940.....20%
Show Low	859.....-7%	Van Nuys	913-916.....8%
Tucson	856-857.....5%	Whittier	906.....8%
Yuma	853.....2%	Colorado Average	1%
Arkansas Average	-7%	Aurora	800-801.....7%
Batesville	725.....-9%	Boulder	803-804.....4%
Camden	717.....-2%	Colorado	
Fayetteville	727.....-4%	Springs	808-809.....0%
Fort Smith	729.....-7%	Denver	802.....8%
Harrison	726.....-12%	Durango	813.....-1%
Hope	718.....-8%	Fort Morgan	807.....-2%
Hot Springs	719.....-13%	Glenwood	
Jonesboro	724.....-9%	Springs	816.....4%
Little Rock	720-722.....-3%	Grand Junction	814-815.....0%
Pine Bluff	716.....-11%	Greeley	806.....5%
Russellville	728.....-4%	Longmont	805.....2%
West Memphis	723.....-2%	Pagosa Springs	811.....-4%
California Average	9%	Pueblo	810.....0%
Alhambra	917-918.....8%	Salida	812.....-6%
Bakersfield	932-933.....2%	Connecticut Average	8%
El Centro	922.....0%	Bridgeport	66.....6%
Eureka	955.....7%	Bristol	60.....12%
Fresno	936-938.....-2%	Fairfield	64.....9%
		Hartford	61.....11%
		New Haven	65.....7%

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

Norwich	63.....3%	Hawaii Average	20%
Stamford	068-069.....12%	Aliamanu	968.....22%
Waterbury	67.....6%	Ewa	967.....20%
West Hartford	62.....5%	Halawa Heights	967.....20%
Delaware Average	2%	Hilo	967.....20%
Dover	199.....-4%	Honolulu	968.....22%
Newark	197.....6%	Kailua	968.....22%
Wilmington	198.....4%	Lualualei	967.....20%
District of Columbia		Mililani Town	967.....20%
Washington	200-205.....12%	Pearl City	967.....20%
Florida Average	-5%	Wahiawa	967.....20%
Altamonte		Waianae	967.....20%
Springs	327.....-3%	Wailuku (Maui)	967.....20%
Bradenton	342.....-6%	Idaho Average	-9%
Brooksville	346.....-7%	Boise	837.....-5%
Daytona Beach	321.....-9%	Coeur d'Alene	838.....-10%
Fort Lauderdale	333.....2%	Idaho Falls	834.....-9%
Fort Myers	339.....-6%	Lewiston	835.....-11%
Fort Pierce	349.....-10%	Meridian	836.....-9%
Gainesville	326.....-9%	Pocatello	832.....-10%
Jacksonville	322.....-2%	Sun Valley	833.....-8%
Lakeland	338.....-8%	Illinois Average	4%
Melbourne	329.....-8%	Arlington Heights	600.....14%
Miami	330-332.....1%	Aurora	605.....14%
Naples	341.....-2%	Belleville	622.....0%
Ocala	344.....-12%	Bloomington	617.....-1%
Orlando	328.....1%	Carbondale	629.....-4%
Panama City	324.....-11%	Carol Stream	601.....14%
Pensacola	325.....-8%	Centralia	628.....-3%
Saint Augustine	320.....-2%	Champaign	618.....-2%
Saint Cloud	347.....-2%	Chicago	606-608.....15%
St Petersburg	337.....-6%	Decatur	623.....-7%
Tallahassee	323.....-6%	Galesburg	614.....-4%
Tampa	335-336.....-1%	Granite City	620.....3%
W. Palm Beach	334.....-2%	Green River	612.....5%
Georgia Average	-4%	Joliet	604.....13%
Albany	317.....-6%	Kankakee	609.....-3%
Athens	306.....-5%	Lawrenceville	624.....-6%
Atlanta	303.....12%	Oak Park	603.....18%
Augusta	308-309.....-2%	Peoria	615-616.....6%
Buford	305.....-2%	Peru	613.....2%
Calhoun	307.....-9%	Quincy	602.....16%
Columbus	318-319.....-3%	Rockford	610-611.....3%
Dublin/Fort Valley	310.....-8%	Springfield	625-627.....0%
Hinesville	313.....-6%	Urbana	619.....-4%
Kings Bay	315.....-10%	Indiana Average	-3%
Macon	312.....-4%	Aurora	470.....-5%
Marietta	300-302.....4%	Bloomington	474.....-2%
Savannah	314.....-4%	Columbus	472.....-4%
Statesboro	304.....-11%	Elkhart	465.....-4%
Valdosta	316.....-1%	Evansville	476-477.....4%

Fort Wayne	467-468	-1%	Maine Average	-5%	Meridian	393	3%	New Mexico Average	-8%			
Gary	463-464	8%	Auburn	42	-4%	Tupelo	388	-7%	Alamogordo	883	-11%	
Indianapolis	460-462	4%	Augusta	43	-5%	Missouri Average	-3%	Albuquerque	870-871	-3%		
Jasper	475	-8%	Bangor	44	-6%	Cape Girardeau	637	-5%	Clovis	881	-11%	
Jeffersonville	471	-5%	Bath	45	-6%	Caruthersville	638	-7%	Farmington	874	-1%	
Kokomo	469	-8%	Brunswick	039-040	-1%	Chillicothe	646	-4%	Fort Sumner	882	-2%	
Lafayette	479	-5%	Camden	48	-10%	Columbia	652	-4%	Gallup	873	-7%	
Muncie	473	-8%	Cutler	46	-7%	East Lynne	647	4%	Holman	877	-10%	
South Bend	466	-2%	Dexter	49	-4%	Farmington	636	-8%	Las Cruces	880	-8%	
Terre Haute	478	-3%	Northern Area	47	-8%	Hannibal	634	-2%	Santa Fe	875	-8%	
Iowa Average	-3%		Portland	41	2%	Independence	640	5%	Socorro	878	-14%	
Burlington	526	1%	Maryland Average	2%	Jefferson City	650-651	-5%	Truth or Consequences	879	-8%		
Carroll	514	-11%	Annapolis	214	8%	Joplin	648	-6%	Tucumcari	884	-8%	
Cedar Falls	506	-4%	Baltimore	210-212	7%	Kansas City	641	6%	New York Average	6%		
Cedar Rapids	522-524	2%	Bethesda	208-209	13%	Kirksville	635	-15%	Albany	120-123	7%	
Cherokee	510	1%	Church Hill	216	-4%	Knob Noster	653	3%	Amityville	117	9%	
Council Bluffs	515	-1%	Cumberland	215	-8%	Lebanon	654-655	-12%	Batavia	140	1%	
Creston	508	1%	Elkton	219	-5%	Poplar Bluff	639	-10%	Binghamton	137-139	-2%	
Davenport	527-528	1%	Frederick	217	7%	Saint Charles	633	1%	Bronx	104	10%	
Decorah	521	-8%	Laurel	206-207	8%	Saint Joseph	644-645	-1%	Brooklyn	112	7%	
Des Moines	500-503	5%	Salisbury	218	-6%	Springfield	656-658	8%	Buffalo	142	1%	
Dubuque	520	-4%	Massachusetts Average	12%	St Louis	630-631	8%	Elmira	149	-3%		
Fort Dodge	505	-3%	Ayer	015-016	6%	Montana Average	-3%	Flushing	113	15%		
Mason City	504	-3%	Bedford	17	15%	Billings	590-591	2%	Garden City	115	15%	
Ottumwa	525	-6%	Boston	021-022	37%	Butte	597	-3%	Hicksville	118	14%	
Sheldon	512	-7%	Brockton	023-024	20%	Fairview	592	12%	Ithaca	148	-5%	
Shenandoah	516	-14%	Cape Cod	26	4%	Great Falls	594	-6%	Jamaica	114	14%	
Sioux City	511	5%	Chicopee	10	7%	Havre	595	-9%	Jamestown	147	-7%	
Spencer	513	-7%	Dedham	19	18%	Helena	596	-2%	Kingston	124	-4%	
Waterloo	507	-3%	Fitchburg	14	11%	Kalispell	599	-6%	Long Island	111	30%	
Kansas Average	0%		Hingham	20	19%	Miles City	593	-7%	Montauk	119	7%	
Colby	677	-8%	Lawrence	18	14%	Missoula	598	-6%	New York (Manhattan)	100-102	31%	
Concordia	669	-12%	Nantucket	25	9%	Nebraska Average	-8%	New York City	100-102	31%		
Dodge City	678	-4%	New Bedford	27	6%	Alliance	693	-10%	Newcomb	128	0%	
Emporia	668	8%	Northfield	13	2%	Columbus	686	-7%	Niagara Falls	143	-6%	
Fort Scott	667	-6%	Pittsfield	12	1%	Grand Island	688	-8%	Plattsburgh	129	-1%	
Hays	676	-13%	Springfield	11	8%	Hastings	689	-9%	Poughkeepsie	125-126	1%	
Hutchinson	675	-6%	Michigan Average	1%	Lincoln	683-685	-4%	Queens	110	17%		
Independence	673	29%	Battle Creek	490-491	-1%	McCook	690	-9%	Rochester	144-146	2%	
Kansas City	660-662	5%	Detroit	481-482	7%	Norfolk	687	-10%	Rockaway	116	10%	
Liberal	679	14%	Flint	484-485	-4%	North Platte	691	-6%	Rome	133-134	-4%	
Salina	674	-7%	Grand Rapids	493-495	1%	Omaha	680-681	0%	Staten Island	103	8%	
Topeka	664-666	-1%	Grayling	497	-7%	Valentine	692	-15%	Stewart	127	-5%	
Wichita	670-672	-4%	Jackson	492	-1%	Nevada Average	1%	Syracuse	130-132	2%		
Kentucky Average	-4%		Lansing	488-489	0%	Carson City	897	-4%	Tonawanda	141	-1%	
Ashland	411-412	-4%	Marquette	498-499	3%	Elko	898	9%	Utica	135	-6%	
Bowling Green	421	-5%	Pontiac	483	12%	Ely	893	-3%	Watertown	136	-1%	
Campton	413-414	-11%	Royal Oak	480	7%	Fallon	894	0%	West Point	109	6%	
Covington	410	2%	Saginaw	486-487	-5%	Las Vegas	889-891	3%	White Plains	105-108	14%	
Elizabethtown	427	-10%	Traverse City	496	-2%	Reno	895	-1%	North Carolina Average	-4%		
Frankfort	406	7%	Minnesota Average	-1%	New Hampshire Average	-1%	Charlestown	36	-5%	Asheville	287-289	-7%
Hazard	417-418	-10%	Bemidji	566	-6%	Concord	34	-3%	Charlotte	280-282	7%	
Hopkinsville	422	-5%	Brainerd	564	-3%	Dover	38	1%	Durham	277	0%	
Lexington	403-405	1%	Duluth	556-558	2%	Lebanon	37	-3%	Elizabeth City	279	-8%	
London	407-409	-7%	Fergus Falls	565	-10%	Littleton	35	-6%	Fayetteville	283	-6%	
Louisville	400-402	2%	Magnolia	561	-8%	Manchester	032-033	2%	Goldsboro	275	0%	
Owensboro	423	-4%	Mankato	560	-4%	New Boston	030-031	3%	Greensboro	274	-3%	
Paducah	420	0%	Minneapolis	553-555	13%	New Jersey Average	9%	Hickory	286	-8%		
Pikeville	415-416	-8%	Rochester	559	-1%	Atlantic City	080-084	4%	Kinston	285	-9%	
Somerset	425-426	-11%	St Cloud	563	2%	Brick	87	2%	Raleigh	276	3%	
White Plains	424	-4%	St Paul	550-551	12%	Dover	78	9%	Rocky Mount	278	-7%	
Louisiana Average	2%		Thief River Falls	567	-2%	Edison	088-089	13%	Wilmington	284	-6%	
Alexandria	713-714	4%	Willmar	562	-6%	Hackensack	76	10%	Winston-Salem	270-273	-5%	
Baton Rouge	707-708	10%	Mississippi Average	-6%	Monmouth	77	12%	North Dakota Average	4%			
Houma	703	4%	Clarksdale	386	-9%	Newark	071-073	11%	Bismarck	585	3%	
Lafayette	705	8%	Columbus	397	0%	Passaic	70	12%	Dickinson	586	15%	
Lake Charles	706	13%	Greenville	387	-14%	Paterson	074-075	7%	Fargo	580-581	0%	
Mandeville	704	-3%	Greenwood	389	-10%	Princeton	85	10%	Grand Forks	582	-1%	
Minden	710	-5%	Gulfport	395	-6%	Summit	79	16%				
Monroe	712	-8%	Jackson	390-392	-3%	Trenton	86	7%				
New Orleans	700-701	2%	Laurel	394	-7%							
Shreveport	711	-4%	McComb	396	-11%							

Jamestown	584.....-4%	New Castle	161.....-3%	Houston	770-772 .....26%	Huntington	255-257 .....-4%
Minot	587.....9%	Philadelphia	190-191 .....11%	Huntsville	773.....26%	Lewisburg	249.....-14%
Nekoma	583.....-10%	Pittsburgh	152.....6%	Longview	756.....1%	Martinsburg	254.....-5%
Williston	588.....21%	Pottsville	179.....-8%	Lubbock	793-794 .....-7%	Morgantown	265.....-4%
Ohio Average	0%	Punxsutawney	157.....-3%	Lufkin	759.....8%	New Martinsville	262.....-9%
Akron	442-443 .....1%	Reading	195-196 .....2%	McAllen	785.....-6%	Parkersburg	261.....1%
Canton	446-447 .....-2%	Scranton	184-185 .....1%	Midland	797.....10%	Romney	267.....-7%
Chillicothe	456.....-2%	Somerset	155.....-9%	Palestine	758.....2%	Sugar Grove	268.....-8%
Cincinnati	450-452 .....3%	Southeastern	193.....8%	Plano	750.....7%	Wheeling	260.....5%
Cleveland	440-441 .....3%	Uniontown	154.....-6%	San Angelo	769.....-6%	Wisconsin Average	0%
Columbus	432.....5%	Valley Forge	194.....11%	San Antonio	780-782 .....8%	Amery	540.....-1%
Dayton	453-455 .....1%	Warminster	189.....11%	Texarkana	755.....-8%	Beloit	535.....5%
Lima	458.....-5%	Warrendale	150-151 .....5%	Tyler	757.....-7%	Clam Lake	545.....-8%
Marietta	457.....-5%	Washington	153.....8%	Victoria	779.....12%	Eau Claire	547.....-2%
Marion	433.....-6%	Wilkes Barre	186-187 .....-1%	Waco	765-767 .....-3%	Green Bay	541-543 .....3%
Newark	430-431 .....3%	Williamsport	177.....-2%	Wichita Falls	763.....-9%	La Crosse	546.....0%
Sandusky	448-449 .....-3%	York	173-174 .....-1%	Woodson	764.....-3%	Ladysmith	548.....-2%
Steubenville	439.....1%	Rhode Island Average	5%	Utah Average	-3%	Madison	537.....8%
Toledo	434-436 .....7%	Bristol	28.....5%	Clearfield	840.....0%	Milwaukee	530-534 .....6%
Warren	444.....-5%	Coventry	28.....5%	Green River	845.....-3%	Oshkosh	549.....4%
Youngstown	445.....-3%	Cranston	29.....6%	Ogden	843-844 .....-9%	Portage	539.....0%
Zanesville	437-438 .....-1%	Davisville	28.....5%	Provo	846-847 .....-6%	Prairie du Chien	538.....-7%
Oklahoma Average	-5%	Narragansett	28.....5%	Salt Lake City	841.....-1%	Wausau	544.....-3%
Adams	739.....-10%	Newport	28.....5%	Vermont Average	-5%	Wyoming Average	-1%
Ardmore	734.....-1%	Providence	29.....6%	Albany	58.....-7%	Casper	826.....1%
Clinton	736.....-3%	Warwick	28.....5%	Battleboro	53.....-4%	Cheyenne/ Laramie	820.....-2%
Durant	747.....-11%	South Carolina Average	-1%	Beecher Falls	59.....-8%	Gillette	827.....3%
Enid	737.....-4%	Aiken	298.....4%	Bennington	52.....-6%	Powell	824.....-3%
Lawton	735.....-8%	Beaufort	299.....-2%	Burlington	54.....-4%	Rawlins	823.....8%
McAlester	745.....-7%	Charleston	294.....-1%	Montpelier	56.....-4%	Riverton	825.....-6%
Muskogee	744.....-8%	Columbia	290-292 .....-2%	Rutland	57.....-7%	Rock Springs	829-831 .....1%
Norman	730.....-4%	Greenville	296.....8%	Springfield	51.....-6%	Sheridan	828.....-3%
Oklahoma City	731.....-3%	Myrtle Beach	295.....-8%	White River Junction	50.....-5%	Wheatland	822.....-3%
Ponca City	746.....-1%	Rock Hill	297.....-6%	Virginia Average	-4%	CANADIAN AREA MODIFIERS	
Poteau	749.....-7%	Spartanburg	293.....-4%	Abingdon	242.....-9%	These figures assume an exchange rate of \$1.00 Canadian to \$0.76 U.S.	
Pryor	743.....-6%	South Dakota Average	-6%	Alexandria	220-223 .....10%	Alberta	13%
Shawnee	748.....-8%	Aberdeen	574.....-7%	Charlottesville	229.....-6%	Calgary	.....14%
Tulsa	740-741 .....0%	Mitchell	573.....-6%	Chesapeake	233.....-4%	Edmonton	.....14%
Woodward	738.....5%	Mobridge	576.....-9%	Culpeper	227.....-5%	Fort McMurray	.....12%
Oregon Average	-3%	Pierre	575.....-10%	Farmville	239.....-12%	British Columbia	7%
Adrian	979.....-12%	Rapid City	577.....-8%	Fredericksburg	224-225 .....-5%	Fraser Valley	.....6%
Bend	977.....-5%	Sioux Falls	570-571 .....-1%	Galax	243.....-10%	Okanagan	.....6%
Eugene	974.....-3%	Watertown	572.....-4%	Harrisonburg	228.....-6%	Vancouver	.....9%
Grants Pass	975.....-5%	Tennessee Average	-2%	Lynchburg	245.....-9%	Manitoba	0%
Klamath Falls	976.....-8%	Chattanooga	374.....2%	Norfolk	235-237 .....-2%	North Manitoba	.....0%
Pendleton	978.....-3%	Clarksville	370.....1%	Petersburg	238.....-3%	South Manitoba	.....0%
Portland	970-972 .....10%	Cleveland	373.....-1%	Radford	241.....-9%	Selkirk	.....0%
Salem	973.....-2%	Columbia	384.....-7%	Reston	201.....7%	Winnipeg	.....0%
Pennsylvania Average	-1%	Cookeville	385.....-8%	Richmond	232.....2%	New Brunswick	-13%
Allentown	181.....-3%	Jackson	383.....-2%	Roanoke	240.....-9%	Moncton	.....-13%
Altoona	166.....-8%	Kingsport	376.....-5%	Staunton	244.....-7%	Nova Scotia	-8%
Beaver Springs	178.....-5%	Knoxville	377-379 .....-2%	Tazewell	246.....-6%	Amherst	.....-8%
Bethlehem	180.....4%	McKenzie	382.....-8%	Virginia Beach	234.....-3%	Nova Scotia	.....-7%
Bradford	167.....-8%	Memphis	380-381 .....1%	Williamsburg	230-231 .....-3%	Sydney	.....-8%
Butler	160.....-2%	Nashville	371-372 .....2%	Winchester	226.....4%	Newfoundland/ Labrador	-3%
Chambersburg	172.....-7%	Texas Average	5%	Washington Average	0%	Ontario	7%
Clearfield	168.....-3%	Abilene	795-796 .....-2%	Clarkston	994.....-8%	London	.....7%
DuBois	158.....-10%	Amarillo	790-791 .....-2%	Everett	982.....2%	Thunder Bay	.....6%
East Stroudsburg	183.....-5%	Arlington	760.....1%	Olympia	985.....-2%	Toronto	.....7%
Erie	164-165 .....-6%	Austin	786-787 .....12%	Pasco	993.....1%	Quebec	-1%
Genesee	169.....-4%	Bay City	774.....39%	Seattle	980-981 .....11%	Montreal	.....-1%
Greensburg	156.....-4%	Beaumont	776-777 .....18%	Spokane	990-992 .....3%	Quebec City	.....-1%
Harrisburg	170-171 .....3%	Brownwood	768.....-8%	Tacoma	983-984 .....2%	Saskatchewan	4%
Hazleton	182.....-3%	Bryan	778.....8%	Vancouver	986.....3%	La Ronge	.....3%
Johnstown	159.....-9%	Childress	792.....-14%	Wenatchee	988.....-6%	Prince Albert	.....2%
Kittanning	162.....-6%	Corpus Christi	783-784 .....18%	Yakima	989.....-5%	Saskatoon	.....5%
Lancaster	175-176 .....-1%	Dallas	751-753 .....6%	West Virginia Average	-5%		
Meadville	163.....-9%	Del Rio	788.....0%	Beckley	258-259 .....-5%		
Montrose	188.....-4%	El Paso	798-799 .....-7%	Bluefield	247-248 .....0%		
		Fort Worth	761-762 .....2%	Charleston	250-253 .....4%		
		Galveston	775.....24%	Clarksburg	263-264 .....-7%		
		Giddings	789.....6%	Fairmont	266.....-11%		
		Greenville	754.....3%				

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
AB	1 Air tool operator	8.00	\$44.09	\$352.72		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$595.20	\$37.20	\$52.08
AD	2 Air tool operators	16.00	\$44.09	\$705.44		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$947.92	\$39.50	\$55.30
BD	3 Bricklayers	24.00	\$37.97	\$911.28		
	2 Bricktenders	16.00	\$28.15	\$450.40		
	TOTAL	40.00		\$1,361.68	\$34.04	\$48.34
BK	1 Bricklayer	8.00	\$37.97	\$303.76		
	1 Bricktender	8.00	\$28.15	\$225.20		
	TOTAL	16.00		\$528.96	\$33.06	\$46.95
BO	2 Bricklayers	16.00	\$37.97	\$607.52		
	2 Bricktenders	16.00	\$28.15	\$450.40		
	TOTAL	32.00		\$1,057.92	\$33.06	\$46.95
2C	2 Carpenters	16.00	\$37.38	\$598.08	\$37.38	\$52.33
CA	1 Carpenter	8.00	\$37.38	\$299.04	\$37.38	\$52.33
CH	1 Carpenter	8.00	\$37.38	\$299.04		
	1/2 Laborer	4.00	\$30.31	\$121.24		
	TOTAL	12.00		\$420.28	\$35.02	\$49.03
CJ	1 Carpenter	8.00	\$37.38	\$299.04		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$541.52	\$33.85	\$47.38
CN	2 Carpenters	16.00	\$37.38	\$598.08		
	1/2 Laborer	4.00	\$30.31	\$121.24		
	TOTAL	20.00		\$719.32	\$35.97	\$50.35
CS	2 Carpenters	16.00	\$37.38	\$598.08		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$840.56	\$35.02	\$49.03
CT	1 Mosaic & terrazzo setter	8.00	\$35.35	\$282.80	\$35.35	\$50.20
CU	4 Carpenters	32.00	\$37.38	\$1,196.16		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	40.00		\$1,438.64	\$35.97	\$50.35
CW	2 Carpenters	16.00	\$37.38	\$598.08		
	2 Laborers	16.00	\$30.31	\$484.96		
	TOTAL	32.00		\$1,083.04	\$33.85	\$47.38
CX	4 Carpenters	32.00	\$37.38	\$1,196.16	\$37.38	\$52.33

Crew Code		Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
CY	3 Carpenters	24.00	\$37.38	\$897.12		
	2 Laborers	16.00	\$30.31	\$484.96		
	1 Equipment operator	8.00	\$42.71	\$341.68		
	1 Laborer	8.00	\$30.31	\$242.48		
TOTAL		56.00		\$1,966.24	\$35.11	\$49.16
CZ	4 Carpenters	32.00	\$37.38	\$1,196.16		
	3 Laborers	24.00	\$30.31	\$727.44		
	1 Equipment operator	8.00	\$42.71	\$341.68		
	1 Laborer	8.00	\$30.31	\$242.48		
TOTAL		72.00		\$2,507.76	\$34.83	\$48.76
DD	2 Cement masons	16.00	\$35.55	\$568.80		
	1 Laborer	8.00	\$30.31	\$242.48		
TOTAL		24.00		\$811.28	\$33.80	\$48.00
DF	3 Cement masons	24.00	\$35.55	\$853.20		
	5 Laborers	40.00	\$30.31	\$1,212.40		
TOTAL		64.00		\$2,065.60	\$32.28	\$45.83
DI	1 Drywall installer	8.00	\$36.47	\$291.76	\$36.47	\$51.06
DJ	1 Drywall installer	8.00	\$36.47	\$291.76		
	1 Laborer	8.00	\$30.31	\$242.48		
TOTAL		16.00		\$534.24	\$33.39	\$46.75
DK	1 Drywall installer	8.00	\$36.47	\$291.76		
	1 Drywall taper	8.00	\$36.60	\$292.80		
TOTAL		16.00		\$584.56	\$36.54	\$51.15
DL	2 Drywall installers	16.00	\$36.47	\$583.52		
	1 Drywall taper	8.00	\$36.60	\$292.80		
TOTAL		24.00		\$876.32	\$36.51	\$51.12
DM	2 Drywall installers	16.00	\$36.47	\$583.52	\$36.47	\$51.06
DT	1 Drywall taper	8.00	\$36.60	\$292.80	\$36.60	\$51.24
DU	2 Drywall tapers	16.00	\$36.60	\$585.60	\$36.60	\$51.24
EA	1 Electrician	8.00	\$40.63	\$325.04	\$40.63	\$58.91
EB	2 Electricians	16.00	\$40.63	\$650.08	\$40.63	\$58.91
ED	1 Electrician	8.00	\$40.63	\$325.04		
	1 Carpenter	8.00	\$37.38	\$299.04		
TOTAL		16.00		\$624.08	\$39.01	\$56.56
FA	1 Floorlayer	8.00	\$34.28	\$274.24	\$34.28	\$47.99
FB	2 Floorlayers	16.00	\$34.28	\$548.48		
	1/4 Laborer	2.00	\$30.31	\$60.62		
TOTAL		18.00		\$609.10	\$33.84	\$47.37
FC	1 Floorlayer (hardwood)	8.00	\$35.81	\$286.48	\$35.81	\$50.85

Crew Code		Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
FD	2 Floorlayers (hardwood)	16.00	\$35.81	\$572.97		
	1/4 Laborer	2.00	\$30.31	\$60.62		
	TOTAL	18.00		\$633.59	\$35.20	\$49.98
GA	1 Glazier	8.00	\$36.13	\$289.04	\$36.13	\$51.30
GB	2 Glaziers	16.00	\$36.13	\$578.08	\$36.13	\$51.30
GC	3 Glaziers	24.00	\$36.13	\$867.12	\$36.13	\$51.30
HA	1 Fence erector	8.00	\$38.59	\$308.72	\$38.59	\$54.80
HB	1 Fence erector	8.00	\$38.59	\$308.72		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$551.20	\$34.45	\$48.92
HD	2 Fence erectors	16.00	\$38.59	\$617.44		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$859.92	\$35.83	\$50.88
1L	1 Laborer	8.00	\$30.31	\$242.48	\$30.31	\$42.43
LB	2 Laborers	16.00	\$30.31	\$484.96	\$30.31	\$42.43
LC	2 Laborers	16.00	\$30.31	\$484.96		
	1 Carpenter	8.00	\$37.38	\$299.04		
	TOTAL	24.00		\$784.00	\$32.67	\$45.73
LD	2 Laborers	16.00	\$30.31	\$484.96		
	2 Carpenters	16.00	\$37.38	\$598.08		
	TOTAL	32.00		\$1,083.04	\$33.85	\$47.38
LG	5 Laborers	40.00	\$30.31	\$1,212.40		
	1 Carpenter	8.00	\$37.38	\$299.04		
	TOTAL	48.00		\$1,511.44	\$31.49	\$44.08
LH	3 Laborers	24.00	\$30.31	\$727.44	\$30.31	\$42.43
LJ	4 Laborers	32.00	\$30.31	\$969.92	\$30.31	\$42.43
LK	2 Laborers	16.00	\$30.31	\$484.96		
	2 Carpenters	16.00	\$37.38	\$598.08		
	1 Equipment operator	8.00	\$42.71	\$341.68		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	48.00		\$1,667.20	\$34.73	\$48.63
LL	3 Laborers	24.00	\$30.31	\$727.44		
	1 Carpenter	8.00	\$37.38	\$299.04		
	1 Equipment operator	8.00	\$42.71	\$341.68		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	48.00		\$1,610.64	\$33.56	\$46.98
LR	1 Lather	8.00	\$35.97	\$287.76	\$35.97	\$51.08
MB	1 Millwright finish carpenter	8.00	\$35.23	\$281.84	\$35.23	\$50.03
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$524.32	\$32.77	\$46.53

Crew Code		Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
ML	2 Bricklayers	16.00	\$37.97	\$607.52		
	1 Bricktender	8.00	\$28.15	\$225.20		
	TOTAL	24.00		\$832.72	\$34.70	\$49.27
MR	1 Millwright finish carpenter	8.00	\$35.23	\$281.84	\$35.23	\$50.03
NA	1 Painter (brush)	8.00	\$38.22	\$305.76	\$38.22	\$53.51
NC	1 Painter (spray)	8.00	\$39.17	\$313.33	\$39.17	\$54.83
PD	2 Plasterers	16.00	\$37.46	\$599.36		
	1 Plasterer helper	8.00	\$29.39	\$235.12		
	TOTAL	24.00		\$834.48	\$34.77	\$49.37
PE	3 Plasterers	24.00	\$37.46	\$899.04		
	2 Plasterer helpers	16.00	\$29.39	\$470.24		
	TOTAL	40.00		\$1,369.28	\$34.23	\$48.61
QA	1 Paperhanger	8.00	\$39.93	\$319.47	\$39.93	\$57.90
2R	2 Roofers (journeyman)	16.00	\$41.66	\$666.56	\$41.66	\$61.24
RG	2 Roofers (journeyman)	16.00	\$41.66	\$666.56		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$909.04	\$37.88	\$55.68
RJ	2 Roofers (wood shingles)	16.00	\$43.51	\$696.15	\$43.51	\$63.96
RL	2 Roofers (journeyman)	16.00	\$41.66	\$666.56		
	1/2 Laborer	4.00	\$30.31	\$121.24		
	TOTAL	20.00		\$787.80	\$39.39	\$57.90
RM	2 Roofers (wood shingles)	16.00	\$43.51	\$696.15		
	1/2 Laborer	4.00	\$30.31	\$121.24		
	TOTAL	20.00		\$817.39	\$40.87	\$60.08
RQ	2 Roofers (wood shingles)	16.00	\$43.51	\$696.15		
	7/8 Laborer	7.00	\$30.31	\$212.17		
	TOTAL	23.00		\$908.32	\$39.49	\$58.05
RS	1 Roofer (foreman)	8.00	\$45.60	\$364.79		
	3 Roofers (pitch)	24.00	\$42.69	\$1,024.50		
	2 Laborers	16.00	\$30.31	\$484.96		
	TOTAL	48.00		\$1,874.26	\$39.05	\$57.40
RT	2 Roofers (pitch)	16.00	\$42.69	\$683.00		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$925.48	\$38.56	\$56.69
SA	1 Plumber	8.00	\$43.47	\$347.76	\$43.47	\$63.03
SB	1 Plumber	8.00	\$43.47	\$347.76		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$590.24	\$36.89	\$53.49

Crew Code		Manhours per day	Total costs \$/Hr.	\$/Day	Average Crew Rate (ACR) per Hour	Average Crew Rate (ACROP) per Hour w/O&P
SC	1 Plumber	8.00	\$43.47	\$347.76		
	1 Electrician	8.00	\$40.63	\$325.04		
	TOTAL	16.00		\$672.80	\$42.05	\$60.97
SD	1 Plumber	8.00	\$43.47	\$347.76		
	1 Laborer	8.00	\$30.31	\$242.48		
	1 Electrician	8.00	\$40.63	\$325.04		
	TOTAL	24.00		\$915.28	\$38.14	\$55.30
SE	2 Plumbers	16.00	\$43.47	\$695.52		
	1 Laborer	8.00	\$30.31	\$242.48		
	1 Electrician	8.00	\$40.63	\$325.04		
	TOTAL	32.00		\$1,263.04	\$39.47	\$57.23
SF	2 Plumbers	16.00	\$43.47	\$695.52		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$938.00	\$39.08	\$56.67
SG	3 Plumbers	24.00	\$43.47	\$1,043.28		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	32.00		\$1,285.76	\$40.18	\$58.26
TB	1 Tile setter (ceramic)	8.00	\$35.66	\$285.28		
	1 Tile setter helper (ceramic)	8.00	\$26.91	\$215.31		
	TOTAL	16.00		\$500.59	\$31.29	\$44.43
UA	1 Sheet metal worker	8.00	\$42.16	\$337.28	\$42.16	\$59.87
UB	2 Sheet metal workers	16.00	\$42.16	\$674.56	\$42.16	\$59.87
UC	2 Sheet metal workers	16.00	\$42.16	\$674.56		
	2 Laborers	16.00	\$30.31	\$484.96		
	TOTAL	32.00		\$1,159.52	\$36.24	\$51.45
UD	1 Sheet metal worker	8.00	\$42.16	\$337.28		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$579.76	\$36.24	\$51.45
UE	1 Sheet metal worker	8.00	\$42.16	\$337.28		
	1 Laborer	8.00	\$30.31	\$242.48		
	1/2 Electrician	4.00	\$40.63	\$162.52		
	TOTAL	20.00		\$742.28	\$37.11	\$52.70
UF	2 Sheet metal workers	16.00	\$42.16	\$674.56		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	24.00		\$917.04	\$38.21	\$54.26
VB	1 Equipment operator	8.00	\$42.71	\$341.68		
	1 Laborer	8.00	\$30.31	\$242.48		
	TOTAL	16.00		\$584.16	\$36.51	\$51.11

Abbreviations Used in This Book

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

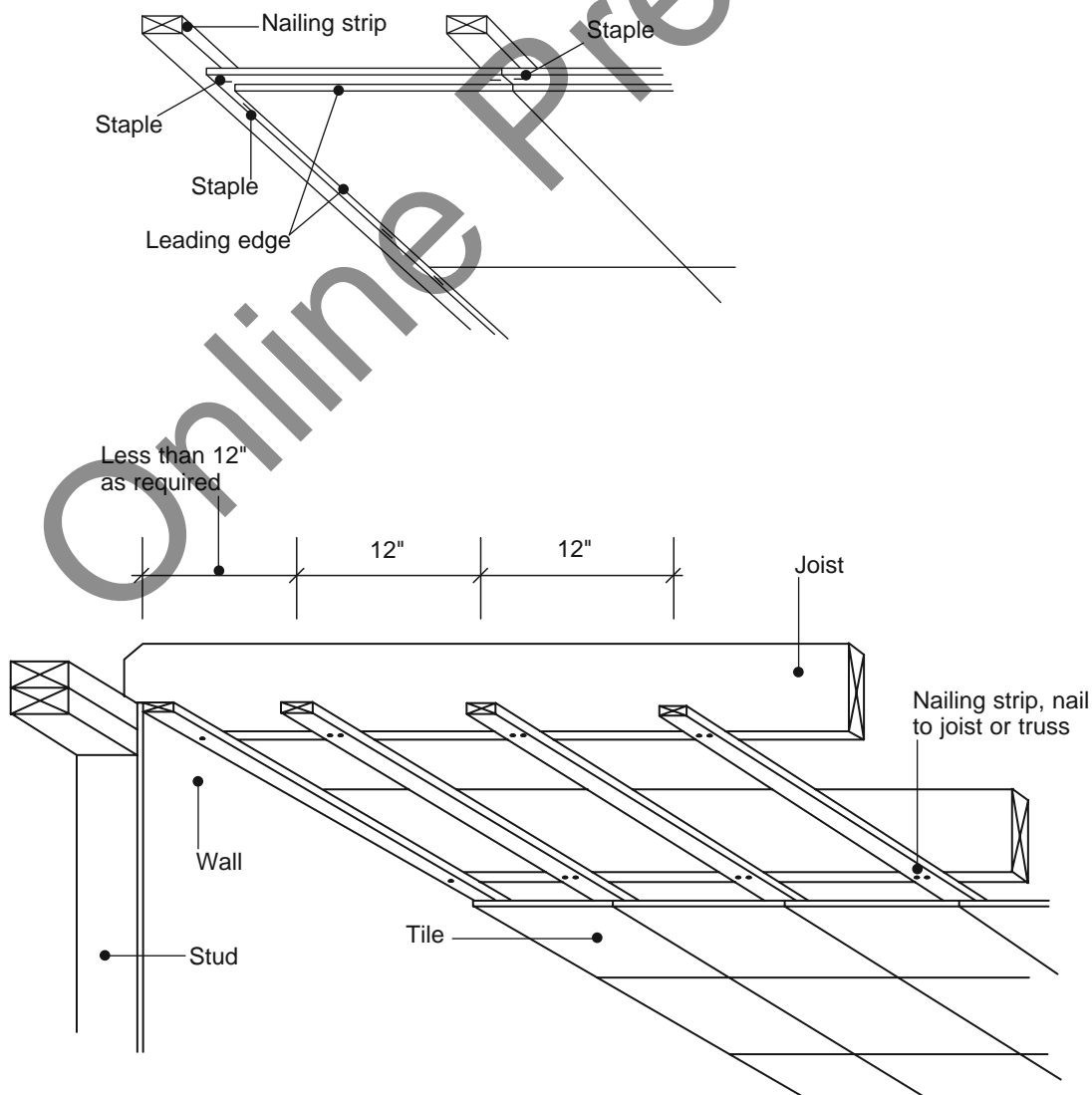
- Acoustical tile. $\frac{1}{2}$ " thick x 12" x 12", 24".
- Insulating tile, decorative. $\frac{1}{2}$ " thick x 12" x 12", 24"; $\frac{1}{2}$ " thick x 16" x 16", 32".

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 447

Ceiling and wall tile

Adhesive set

Tile only, no grid system

	Demo	SF	Lg	LB	.012	1300	---	.36	---	.36	.51
	Demo	SF	Sm	LB	.018	910.0	---	.55	---	.55	.76
Tile on furring strips											
	Demo	SF	Lg	LB	.009	1710	---	.27	---	.27	.38
	Demo	SF	Sm	LB	.013	1197	---	.39	---	.39	.55

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	1.43	.67	---	2.10	2.59
	Inst	SF	Sm	2C	.026	616.0	1.59	.97	---	2.56	3.19
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.66	.67	---	2.33	2.85
	Inst	SF	Sm	2C	.026	616.0	1.84	.97	---	2.81	3.48
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.21	.67	---	2.88	3.48
	Inst	SF	Sm	2C	.026	616.0	2.45	.97	---	3.42	4.18
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	2.56	.67	---	3.23	3.89
	Inst	SF	Sm	2C	.026	616.0	2.82	.97	---	3.79	4.60

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

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	1.70	.67	---	2.37	2.90
	Inst	SF	Sm	2C	.026	616.0	1.88	.97	---	2.85	3.52
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.99	.67	---	2.66	3.23
	Inst	SF	Sm	2C	.026	616.0	2.19	.97	---	3.16	3.88
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.67	.67	---	3.34	4.01
	Inst	SF	Sm	2C	.026	616.0	2.95	.97	---	3.92	4.75
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	3.10	.67	---	3.77	4.51
	Inst	SF	Sm	2C	.026	616.0	3.42	.97	---	4.39	5.29

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

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	1.85	.67	---	2.52	3.07
	Inst	SF	Sm	2C	.026	616.0	2.05	.97	---	3.02	3.72
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	2.18	.67	---	2.85	3.45
	Inst	SF	Sm	2C	.026	616.0	2.40	.97	---	3.37	4.12
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.95	.67	---	3.62	4.33
	Inst	SF	Sm	2C	.026	616.0	3.26	.97	---	4.23	5.11
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	3.43	.67	---	4.10	4.89
	Inst	SF	Sm	2C	.026	616.0	3.79	.97	---	4.76	5.72

Applied by adhesive to furring strips ADD

	Inst	SF	Lg	2C	.002	---	---	.07	---	.07	.10
	Inst	SF	Sm	2C	.002	---	---	.07	---	.07	.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
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Stapled

Tile only, no grid system	Demo	SF	Lg	LB	.014	1170	---	.42	---	.42	.59
	Demo	SF	Sm	LB	.020	819	---	.61	---	.61	.85
Tile on furring strips	Demo	SF	Lg	LB	.010	1540	---	.30	---	.30	.42
	Demo	SF	Sm	LB	.015	1078	---	.45	---	.45	.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	1.15	.64	---	1.79	2.21
	Inst	SF	Sm	2C	.024	672.0	1.27	.90	---	2.17	2.72
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.38	.64	---	2.02	2.48
	Inst	SF	Sm	2C	.024	672.0	1.52	.90	---	2.42	3.00
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	1.93	.64	---	2.57	3.11
	Inst	SF	Sm	2C	.024	672.0	2.13	.90	---	3.03	3.71
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	2.27	.64	---	2.91	3.50
	Inst	SF	Sm	2C	.024	672.0	2.51	.90	---	3.41	4.14

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

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	1.42	.64	---	2.06	2.52
	Inst	SF	Sm	2C	.024	672.0	1.56	.90	---	2.46	3.05
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.70	.64	---	2.34	2.84
	Inst	SF	Sm	2C	.024	672.0	1.88	.90	---	2.78	3.42
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.38	.64	---	3.02	3.63
	Inst	SF	Sm	2C	.024	672.0	2.64	.90	---	3.54	4.29
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	2.81	.64	---	3.45	4.12
	Inst	SF	Sm	2C	.024	672.0	3.11	.90	---	4.01	4.83

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

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	1.57	.64	---	2.21	2.70
	Inst	SF	Sm	2C	.024	672.0	1.73	.90	---	2.63	3.25
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.89	.64	---	2.53	3.06
	Inst	SF	Sm	2C	.024	672.0	2.09	.90	---	2.99	3.66
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.66	.64	---	3.30	3.95
	Inst	SF	Sm	2C	.024	672.0	2.94	.90	---	3.84	4.64
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	3.14	.64	---	3.78	4.50
	Inst	SF	Sm	2C	.024	672.0	3.48	.90	---	4.38	5.26

Applied by staples, nails or clips to furring strips ADD

	Inst	SF	Lg	2C	.017	960.0	---	.64	---	.64	.89
	Inst	SF	Sm	2C	.024	672.0	---	.90	---	.90	1.26

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	.27	.37	---	.64	.83
	Inst	SF	Sm	2C	.014	1120	.29	.52	---	.81	1.07
1" x 4", 16" oc	Inst	SF	Lg	2C	.008	1920	.23	.30	---	.53	.68
	Inst	SF	Sm	2C	.012	1344	.25	.45	---	.70	.92

Over plaster

1" x 4", 12" oc	Inst	SF	Lg	2C	.013	1280	.27	.49	---	.76	.99
	Inst	SF	Sm	2C	.018	896	.29	.67	---	.96	1.28
1" x 4", 16" oc	Inst	SF	Lg	2C	.010	1600	.23	.37	---	.60	.79
	Inst	SF	Sm	2C	.014	1120	.25	.52	---	.77	1.02

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 adhesives, on floors

12" oc members

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	2.43	2.80	---	5.23	6.65
	Inst	CSF	Sm	CA	.101	79.50	2.69	3.78	---	6.47	8.30
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	9.69	2.80	---	12.49	14.80
	Inst	CSF	Sm	CA	.101	79.50	10.70	3.78	---	14.48	17.30
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	21.90	2.80	---	24.70	28.40
	Inst	CSF	Sm	CA	.101	79.50	24.20	3.78	---	27.98	32.40
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	38.70	2.80	---	41.50	47.30
	Inst	CSF	Sm	CA	.101	79.50	42.80	3.78	---	46.58	53.20

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	1.95	2.09	---	4.04	5.11
	Inst	CSF	Sm	CA	.075	107.3	2.15	2.80	---	4.95	6.33
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	7.76	2.09	---	9.85	11.60
	Inst	CSF	Sm	CA	.075	107.3	8.58	2.80	---	11.38	13.50
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	17.50	2.09	---	19.59	22.50
	Inst	CSF	Sm	CA	.075	107.3	19.30	2.80	---	22.10	25.60
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	30.90	2.09	---	32.99	37.60
	Inst	CSF	Sm	CA	.075	107.3	34.20	2.80	---	37.00	42.30

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	1.46	1.94	---	3.40	4.36
	Inst	CSF	Sm	CA	.069	115.5	1.61	2.58	---	4.19	5.41
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	5.81	1.94	---	7.75	9.23
	Inst	CSF	Sm	CA	.069	115.5	6.43	2.58	---	9.01	10.80
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	13.10	1.94	---	15.04	17.40
	Inst	CSF	Sm	CA	.069	115.5	14.50	2.58	---	17.08	19.90
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	23.20	1.94	---	25.14	28.70
	Inst	CSF	Sm	CA	.069	115.5	25.70	2.58	---	28.28	32.40

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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Wall sheathing or shear panel wall adhesive on walls, floors or ceilings**12" oc members**

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	8.10	3.74	---	11.84	14.30
	Inst	CSF	Sm	CA	.133	60.00	8.96	4.97	---	13.93	17.00
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	32.30	3.74	---	36.04	41.40
	Inst	CSF	Sm	CA	.133	60.00	35.70	4.97	---	40.67	47.00
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	72.90	3.74	---	76.64	86.90
	Inst	CSF	Sm	CA	.133	60.00	80.60	4.97	---	85.57	97.30
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	129.00	3.74	---	132.74	150.00
	Inst	CSF	Sm	CA	.133	60.00	143.00	4.97	---	147.97	167.00

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	6.49	3.40	---	9.89	12.00
	Inst	CSF	Sm	CA	.121	66.00	7.18	4.52	---	11.70	14.40
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	25.80	3.40	---	29.20	33.70
	Inst	CSF	Sm	CA	.121	66.00	28.60	4.52	---	33.12	38.40
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	58.30	3.40	---	61.70	70.10
	Inst	CSF	Sm	CA	.121	66.00	64.50	4.52	---	69.02	78.60
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	103.00	3.40	---	106.40	120.00
	Inst	CSF	Sm	CA	.121	66.00	114.00	4.52	---	118.52	134.00

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	4.87	3.14	---	8.01	9.85
	Inst	CSF	Sm	CA	.112	71.25	5.39	4.19	---	9.58	11.90
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	19.40	3.14	---	22.54	26.10
	Inst	CSF	Sm	CA	.112	71.25	21.40	4.19	---	25.59	29.90
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	43.70	3.14	---	46.84	53.40
	Inst	CSF	Sm	CA	.112	71.25	48.40	4.19	---	52.59	60.00
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	77.40	3.14	---	80.54	91.00
	Inst	CSF	Sm	CA	.112	71.25	85.60	4.19	---	89.79	102.00

Polystyrene or polyurethane foam panel adhesive, on walls**12" oc members**

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	4.05	3.74	---	7.79	9.77
	Inst	CSF	Sm	CA	.133	60.00	4.48	4.97	---	9.45	12.00
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	16.20	3.74	---	19.94	23.30
	Inst	CSF	Sm	CA	.133	60.00	17.90	4.97	---	22.87	27.00
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	36.40	3.74	---	40.14	46.00
	Inst	CSF	Sm	CA	.133	60.00	40.30	4.97	---	45.27	52.10
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	64.50	3.74	---	68.24	77.40
	Inst	CSF	Sm	CA	.133	60.00	71.30	4.97	---	76.27	86.90

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.24	3.40	---	6.64	8.39
	Inst	CSF	Sm	CA	.121	66.00	3.59	4.52	---	8.11	10.40
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.90	3.40	---	16.30	19.20
	Inst	CSF	Sm	CA	.121	66.00	14.30	4.52	---	18.82	22.30
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	29.20	3.40	---	32.60	37.40
	Inst	CSF	Sm	CA	.121	66.00	32.30	4.52	---	36.82	42.50
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	51.60	3.40	---	55.00	62.50
	Inst	CSF	Sm	CA	.121	66.00	57.10	4.52	---	61.62	70.20

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
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.43	3.14	---	5.57	7.12
	Inst	CSF	Sm	CA	.129	62.00	2.69	4.82	---	7.51	9.76
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.69	3.14	---	12.83	15.30
	Inst	CSF	Sm	CA	.129	62.00	10.70	4.82	---	15.52	18.80
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	21.90	3.14	---	25.04	28.90
	Inst	CSF	Sm	CA	.129	62.00	24.20	4.82	---	29.02	33.80
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	38.70	3.14	---	41.84	47.70
	Inst	CSF	Sm	CA	.129	62.00	42.80	4.82	---	47.62	54.70
Gypsum drywall adhesive, on ceilings											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.95	3.74	---	7.69	9.66
	Inst	CSF	Sm	CA	.133	60.00	4.37	4.97	---	9.34	11.90
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	15.80	3.74	---	19.54	22.90
	Inst	CSF	Sm	CA	.133	60.00	17.40	4.97	---	22.37	26.50
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	35.50	3.74	---	39.24	45.00
	Inst	CSF	Sm	CA	.133	60.00	39.30	4.97	---	44.27	51.00
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	62.90	3.74	---	66.64	75.60
	Inst	CSF	Sm	CA	.133	60.00	69.50	4.97	---	74.47	84.80
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.16	3.40	---	6.56	8.30
	Inst	CSF	Sm	CA	.121	66.00	3.49	4.52	---	8.01	10.20
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.60	3.40	---	16.00	18.90
	Inst	CSF	Sm	CA	.121	66.00	13.90	4.52	---	18.42	21.90
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	28.40	3.40	---	31.80	36.60
	Inst	CSF	Sm	CA	.121	66.00	31.40	4.52	---	35.92	41.50
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	50.30	3.40	---	53.70	61.10
	Inst	CSF	Sm	CA	.121	66.00	55.60	4.52	---	60.12	68.70
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.37	3.14	---	5.51	7.05
	Inst	CSF	Sm	CA	.112	71.25	2.62	4.19	---	6.81	8.80
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.45	3.14	---	12.59	15.00
	Inst	CSF	Sm	CA	.112	71.25	10.50	4.19	---	14.69	17.60
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	21.30	3.14	---	24.44	28.30
	Inst	CSF	Sm	CA	.112	71.25	23.60	4.19	---	27.79	32.30
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	37.70	3.14	---	40.84	46.60
	Inst	CSF	Sm	CA	.112	71.25	41.70	4.19	---	45.89	52.60
Gypsum drywall adhesive, on walls											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.95	3.74	---	7.69	9.66
	Inst	CSF	Sm	CA	.133	60.00	4.37	4.97	---	9.34	11.90
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	15.80	3.74	---	19.54	22.90
	Inst	CSF	Sm	CA	.133	60.00	17.40	4.97	---	22.37	26.50
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	35.50	3.74	---	39.24	45.00
	Inst	CSF	Sm	CA	.133	60.00	39.30	4.97	---	44.27	51.00
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	62.90	3.74	---	66.64	75.60
	Inst	CSF	Sm	CA	.133	60.00	69.50	4.97	---	74.47	84.80

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
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.16	3.40	---	6.56	8.30
	Inst	CSF	Sm	CA	.121	66.00	3.49	4.52	---	8.01	10.20
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.60	3.40	---	16.00	18.90
	Inst	CSF	Sm	CA	.121	66.00	13.90	4.52	---	18.42	21.90
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	28.40	3.40	---	31.80	36.60
	Inst	CSF	Sm	CA	.121	66.00	31.40	4.52	---	35.92	41.50
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	50.30	3.40	---	53.70	61.10
	Inst	CSF	Sm	CA	.121	66.00	55.60	4.52	---	60.12	68.70
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.37	3.14	---	5.51	7.05
	Inst	CSF	Sm	CA	.112	71.25	2.62	4.19	---	6.81	8.80
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.45	3.14	---	12.59	15.00
	Inst	CSF	Sm	CA	.112	71.25	10.50	4.19	---	14.69	17.60
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	21.30	3.14	---	24.44	28.30
	Inst	CSF	Sm	CA	.112	71.25	23.60	4.19	---	27.79	32.30
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	37.70	3.14	---	40.84	46.60
	Inst	CSF	Sm	CA	.112	71.25	41.70	4.19	---	45.89	52.60
Hardboard or plastic panel adhesive, on walls											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.85	3.74	---	7.59	9.55
	Inst	CSF	Sm	CA	.133	60.00	4.26	4.97	---	9.23	11.70
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	15.30	3.74	---	19.04	22.40
	Inst	CSF	Sm	CA	.133	60.00	17.00	4.97	---	21.97	26.00
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	34.60	3.74	---	38.34	44.00
	Inst	CSF	Sm	CA	.133	60.00	38.30	4.97	---	43.27	49.80
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	61.30	3.74	---	65.04	73.80
	Inst	CSF	Sm	CA	.133	60.00	67.80	4.97	---	72.77	82.90
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.08	3.40	---	6.48	8.21
	Inst	CSF	Sm	CA	.121	66.00	3.41	4.52	---	7.93	10.20
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.30	3.40	---	15.70	18.50
	Inst	CSF	Sm	CA	.121	66.00	13.60	4.52	---	18.12	21.50
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	27.70	3.40	---	31.10	35.80
	Inst	CSF	Sm	CA	.121	66.00	30.60	4.52	---	35.12	40.70
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	49.00	3.40	---	52.40	59.60
	Inst	CSF	Sm	CA	.121	66.00	54.20	4.52	---	58.72	67.00
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.31	3.14	---	5.45	6.98
	Inst	CSF	Sm	CA	.112	71.25	2.56	4.19	---	6.75	8.73
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.20	3.14	---	12.34	14.70
	Inst	CSF	Sm	CA	.112	71.25	10.20	4.19	---	14.39	17.30
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	20.80	3.14	---	23.94	27.70
	Inst	CSF	Sm	CA	.112	71.25	23.00	4.19	---	27.19	31.60
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	36.70	3.14	---	39.84	45.50
	Inst	CSF	Sm	CA	.112	71.25	40.70	4.19	---	44.89	51.40

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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Air conditioning and ventilating systems

System components

Condensing units

Air cooled, compressor, standard controls

1.0 ton	Inst	Ea	Lg	SB	8.00	2.00	704.00	295.00	---	999.00	1240.00
	Inst	Ea	Sm	SB	10.0	1.60	768.00	369.00	---	1137.00	1300.00
1.5 ton	Inst	Ea	Lg	SB	9.14	1.75	864.00	337.00	---	1201.00	1480.00
	Inst	Ea	Sm	SB	11.4	1.40	942.00	421.00	---	1363.00	1550.00
2.0 ton	Inst	Ea	Lg	SB	10.7	1.50	990.00	395.00	---	1385.00	1710.00
	Inst	Ea	Sm	SB	13.3	1.20	1080.00	491.00	---	1571.00	1790.00
2.5 ton	Inst	Ea	Lg	SB	12.8	1.25	1180.00	472.00	---	1652.00	2040.00
	Inst	Ea	Sm	SB	16.0	1.00	1290.00	590.00	---	1880.00	2150.00
3.0 ton	Inst	Ea	Lg	SB	16.0	1.00	1400.00	590.00	---	1990.00	2470.00
	Inst	Ea	Sm	SB	20.0	0.80	1530.00	738.00	---	2268.00	2600.00
4.0 ton	Inst	Ea	Lg	SB	21.3	0.75	1840.00	786.00	---	2626.00	3260.00
	Inst	Ea	Sm	SB	26.7	0.60	2010.00	985.00	---	2995.00	3440.00
5.0 ton	Inst	Ea	Lg	SB	32.0	0.50	2260.00	1180.00	---	3440.00	4300.00
	Inst	Ea	Sm	SB	40.0	0.40	2460.00	1480.00	---	3940.00	4600.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.33	3.00	---	197.00	---	197.00	285.00
	Inst	Job	Sm	SB	6.67	2.40	---	246.00	---	246.00	357.00

Diffusers

Aluminum, opposed blade damper, unless otherwise noted

Ceiling or sidewall, linear

2" wide	Inst	LF	Lg	UA	.267	30.00	25.90	11.30	---	37.20	45.70
	Inst	LF	Sm	UA	.333	24.00	28.20	14.00	---	42.20	48.10
4" wide	Inst	LF	Lg	UA	.296	27.00	34.70	12.50	---	47.20	57.60
	Inst	LF	Sm	UA	.370	21.60	37.80	15.60	---	53.40	60.00
6" wide	Inst	LF	Lg	UA	.333	24.00	42.90	14.00	---	56.90	69.30
	Inst	LF	Sm	UA	.417	19.20	46.80	17.60	---	64.40	71.80
8" wide	Inst	LF	Lg	UA	.400	20.00	50.10	16.90	---	67.00	81.50
	Inst	LF	Sm	UA	.500	16.00	54.60	21.10	---	75.70	84.50

Perforated, 24" x 24" panel size

6" x 6"	Inst	Ea	Lg	UA	.500	16.00	70.40	21.10	---	91.50	111.00
	Inst	Ea	Sm	UA	.625	12.80	76.80	26.40	---	103.20	114.00
8" x 8"	Inst	Ea	Lg	UA	.571	14.00	72.60	24.10	---	96.70	118.00
	Inst	Ea	Sm	UA	.714	11.20	79.20	30.10	---	109.30	122.00
10" x 10"	Inst	Ea	Lg	UA	.667	12.00	73.70	28.10	---	101.80	125.00
	Inst	Ea	Sm	UA	.833	9.60	80.40	35.10	---	115.50	130.00
12" x 12"	Inst	Ea	Lg	UA	.800	10.00	76.50	33.70	---	110.20	136.00
	Inst	Ea	Sm	UA	1.00	8.00	83.40	42.20	---	125.60	143.00
18" x 18"	Inst	Ea	Lg	UA	1.00	8.00	102.00	42.20	---	144.20	177.00
	Inst	Ea	Sm	UA	1.25	6.40	111.00	52.70	---	163.70	186.00

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
Rectangular, one- to four-way blow											
6" x 6"	Inst	Ea	Lg	UA	.500	16.00	41.30	21.10	---	62.40	77.40
	Inst	Ea	Sm	UA	.625	12.80	45.00	26.40	---	71.40	82.40
12" x 6"	Inst	Ea	Lg	UA	.571	14.00	52.80	24.10	---	76.90	94.90
	Inst	Ea	Sm	UA	.714	11.20	57.60	30.10	---	87.70	100.00
12" x 9"	Inst	Ea	Lg	UA	.667	12.00	62.20	28.10	---	90.30	111.00
	Inst	Ea	Sm	UA	.833	9.60	67.80	35.10	---	102.90	118.00
12" x 12"	Inst	Ea	Lg	UA	.800	10.00	72.60	33.70	---	106.30	131.00
	Inst	Ea	Sm	UA	1.00	8.00	79.20	42.20	---	121.40	139.00
24" x 12"	Inst	Ea	Lg	UA	1.00	8.00	123.00	42.20	---	165.20	202.00
	Inst	Ea	Sm	UA	1.25	6.40	134.00	52.70	---	186.70	209.00
T-bar mounting, 24" x 24" lay in frame											
6" x 6"	Inst	Ea	Lg	UA	.500	16.00	66.60	21.10	---	87.70	106.00
	Inst	Ea	Sm	UA	.625	12.80	72.60	26.40	---	99.00	110.00
9" x 9"	Inst	Ea	Lg	UA	.571	14.00	74.30	24.10	---	98.40	120.00
	Inst	Ea	Sm	UA	.714	11.20	81.00	30.10	---	111.10	124.00
12" x 12"	Inst	Ea	Lg	UA	.667	12.00	97.40	28.10	---	125.50	152.00
	Inst	Ea	Sm	UA	.833	9.60	106.00	35.10	---	141.10	156.00
15" x 15"	Inst	Ea	Lg	UA	.800	10.00	101.00	33.70	---	134.70	164.00
	Inst	Ea	Sm	UA	1.00	8.00	110.00	42.20	---	152.20	170.00
18" x 18"	Inst	Ea	Lg	UA	1.00	8.00	133.00	42.20	---	175.20	213.00
	Inst	Ea	Sm	UA	1.25	6.40	145.00	52.70	---	197.70	220.00
Minimum Job Charge											
	Inst	Job	Lg	UA	2.29	3.50	---	96.60	---	96.60	137.00
	Inst	Job	Sm	UA	2.86	2.80	---	121.00	---	121.00	171.00
Ductwork											
Fabricated rectangular, includes fittings, joints, supports											
Aluminum alloy											
Under 100 lbs	Inst	Lb	Lg	UF	.343	70.00	3.85	13.10	---	16.95	23.00
	Inst	Lb	Sm	UF	.429	56.00	4.20	16.40	---	20.60	27.50
100 to 500 lbs	Inst	Lb	Lg	UF	.267	90.00	2.78	10.20	---	12.98	17.70
	Inst	Lb	Sm	UF	.333	72.00	3.04	12.70	---	15.74	21.10
500 to 1,000 lbs	Inst	Lb	Lg	UF	.218	110.0	2.00	8.33	---	10.33	14.10
	Inst	Lb	Sm	UF	.273	88.00	2.18	10.40	---	12.58	17.00
Over 1,000 lbs	Inst	Lb	Lg	UF	.185	130.0	1.49	7.07	---	8.56	11.80
	Inst	Lb	Sm	UF	.231	104.0	1.62	8.83	---	10.45	14.20
Galvanized steel											
Under 400 lbs	Inst	Lb	Lg	UF	.120	200.0	1.16	4.59	---	5.75	7.85
	Inst	Lb	Sm	UF	.150	160.0	1.26	5.73	---	6.99	9.40
400 to 1,000 lbs	Inst	Lb	Lg	UF	.112	215.0	.74	4.28	---	5.02	6.93
	Inst	Lb	Sm	UF	.140	172.0	.80	5.35	---	6.15	8.40
1,000 to 2,000 lbs	Inst	Lb	Lg	UF	.104	230.0	.55	3.97	---	4.52	6.28
	Inst	Lb	Sm	UF	.130	184.0	.60	4.97	---	5.57	7.65
2,000 to 5,000 lbs	Inst	Lb	Lg	UF	.100	240.0	.44	3.82	---	4.26	5.93
	Inst	Lb	Sm	UF	.125	192.0	.48	4.78	---	5.26	7.26
Over 10,000 lbs	Inst	Lb	Lg	UF	.096	250.0	.39	3.67	---	4.06	5.66
	Inst	Lb	Sm	UF	.120	200.0	.42	4.59	---	5.01	6.93

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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Flexible, coated fabric on spring steel, aluminum, or corrosion-resistant metal

Non-insulated

3" diameter	Inst	LF	Lg	UD	.058	275.0	.86	2.10	---	2.96	3.97
	Inst	LF	Sm	UD	.073	220.0	.94	2.65	---	3.59	4.70
5" diameter	Inst	LF	Lg	UD	.071	225.0	1.00	2.57	---	3.57	4.80
	Inst	LF	Sm	UD	.089	180.0	1.09	3.23	---	4.32	5.67
6" diameter	Inst	LF	Lg	UD	.080	200.0	1.12	2.90	---	4.02	5.40
	Inst	LF	Sm	UD	.100	160.0	1.22	3.62	---	4.84	6.37
7" diameter	Inst	LF	Lg	UD	.091	175.0	1.47	3.30	---	4.77	6.37
	Inst	LF	Sm	UD	.114	140.0	1.61	4.13	---	5.74	7.48
8" diameter	Inst	LF	Lg	UD	.107	150.0	1.53	3.88	---	5.41	7.26
	Inst	LF	Sm	UD	.133	120.0	1.67	4.82	---	6.49	8.51
10" diameter	Inst	LF	Lg	UD	.128	125.0	1.96	4.64	---	6.60	8.84
	Inst	LF	Sm	UD	.160	100.0	2.14	5.80	---	7.94	10.40
12" diameter	Inst	LF	Lg	UD	.160	100.0	2.32	5.80	---	8.12	10.90
	Inst	LF	Sm	UD	.200	80.0	2.53	7.25	---	9.78	12.80

Insulated

3" diameter	Inst	LF	Lg	UD	.064	250.0	1.47	2.32	---	3.79	4.98
	Inst	LF	Sm	UD	.080	200.0	1.61	2.90	---	4.51	5.73
4" diameter	Inst	LF	Lg	UD	.071	225.0	1.47	2.57	---	4.04	5.34
	Inst	LF	Sm	UD	.089	180.0	1.61	3.23	---	4.84	6.19
5" diameter	Inst	LF	Lg	UD	.080	200.0	1.73	2.90	---	4.63	6.11
	Inst	LF	Sm	UD	.100	160.0	1.88	3.62	---	5.50	7.03
6" diameter	Inst	LF	Lg	UD	.091	175.0	1.90	3.30	---	5.20	6.87
	Inst	LF	Sm	UD	.114	140.0	2.08	4.13	---	6.21	7.95
7" diameter	Inst	LF	Lg	UD	.107	150.0	2.32	3.88	---	6.20	8.17
	Inst	LF	Sm	UD	.133	120.0	2.53	4.82	---	7.35	9.37
8" diameter	Inst	LF	Lg	UD	.128	125.0	2.38	4.64	---	7.02	9.32
	Inst	LF	Sm	UD	.160	100.0	2.59	5.80	---	8.39	10.80
10" diameter	Inst	LF	Lg	UD	.160	100.0	3.09	5.80	---	8.89	11.80
	Inst	LF	Sm	UD	.200	80.00	3.37	7.25	---	10.62	13.70
12" diameter	Inst	LF	Lg	UD	.213	75.00	3.60	7.72	---	11.32	15.10
	Inst	LF	Sm	UD	.267	60.00	3.92	9.68	---	13.60	17.70
14" diameter	Inst	LF	Lg	UD	.320	50.00	4.36	11.60	---	15.96	21.50
	Inst	LF	Sm	UD	.400	40.00	4.75	14.50	---	19.25	25.30

Duct accessories

Air extractors

12" x 4"	Inst	Ea	Lg	UA	.333	24.00	13.50	14.00	---	27.50	35.40
	Inst	Ea	Sm	UA	.417	19.20	14.70	17.60	---	32.30	39.70
8" x 6"	Inst	Ea	Lg	UA	.400	20.00	13.50	16.90	---	30.40	39.50
	Inst	Ea	Sm	UA	.500	16.00	14.70	21.10	---	35.80	44.60
20" x 8"	Inst	Ea	Lg	UA	.500	16.00	30.30	21.10	---	51.40	64.70
	Inst	Ea	Sm	UA	.625	12.80	33.00	26.40	---	59.40	70.40
18" x 10"	Inst	Ea	Lg	UA	.571	14.00	29.70	24.10	---	53.80	68.30
	Inst	Ea	Sm	UA	.714	11.20	32.40	30.10	---	62.50	75.20
24" x 12"	Inst	Ea	Lg	UA	.800	10.00	41.30	33.70	---	75.00	95.30
	Inst	Ea	Sm	UA	1.00	8.00	45.00	42.20	---	87.20	105.00

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
Dampers, fire, curtain-type, vertical											
8" x 4"	Inst	Ea	Lg	UA	.333	24.00	18.30	14.00	---	32.30	41.00
	Inst	Ea	Sm	UA	.417	19.20	20.00	17.60	---	37.60	45.00
12" x 4"	Inst	Ea	Lg	UA	.364	22.00	18.30	15.40	---	33.70	42.90
	Inst	Ea	Sm	UA	.455	17.60	20.00	19.20	---	39.20	47.20
16" x 14"	Inst	Ea	Lg	UA	.667	12.00	29.20	28.10	---	57.30	73.50
	Inst	Ea	Sm	UA	.833	9.60	31.80	35.10	---	66.90	81.70
24" x 20"	Inst	Ea	Lg	UA	1.00	8.00	36.90	42.20	---	79.10	102.00
	Inst	Ea	Sm	UA	1.25	6.40	40.20	52.70	---	92.90	115.00
Dampers, multi-blade, opposed blade											
12" x 12"	Inst	Ea	Lg	UA	.500	16.00	27.00	21.10	---	48.10	60.90
	Inst	Ea	Sm	UA	.625	12.80	29.40	26.40	---	55.80	66.80
12" x 18"	Inst	Ea	Lg	UA	.667	12.00	35.80	28.10	---	63.90	81.10
	Inst	Ea	Sm	UA	.833	9.60	39.00	35.10	---	74.10	88.90
24" x 24"	Inst	Ea	Lg	UA	1.00	8.00	75.90	42.20	---	118.10	147.00
	Inst	Ea	Sm	UA	1.25	6.40	82.80	52.70	---	135.50	158.00
48" x 36"	Inst	Ea	Lg	UD	2.67	6.00	230.00	96.80	---	326.80	402.00
	Inst	Ea	Sm	UD	3.33	4.80	251.00	121.00	---	372.00	422.00
Dampers, variable volume modulating, motorized											
12" x 12"	Inst	Ea	Lg	UA	0.80	10.00	139.00	33.70	---	172.70	207.00
	Inst	Ea	Sm	UA	1.00	8.00	151.00	42.20	---	193.20	211.00
24" x 12"	Inst	Ea	Lg	UA	1.33	6.00	166.00	56.10	---	222.10	271.00
	Inst	Ea	Sm	UA	1.67	4.80	181.00	70.40	---	251.40	281.00
30" x 18"	Inst	Ea	Lg	UA	2.00	4.00	308.00	84.30	---	392.30	474.00
	Inst	Ea	Sm	UA	2.50	3.20	336.00	105.00	---	441.00	486.00
Thermostat, ADD	Inst	Ea	Lg	UA	1.33	6.00	33.00	56.10	---	89.10	118.00
	Inst	Ea	Sm	UA	1.67	4.80	36.00	70.40	---	106.40	136.00
Dampers, multi-blade, parallel blade											
8" x 8"	Inst	Ea	Lg	UA	.400	20.00	56.10	16.90	---	73.00	88.50
	Inst	Ea	Sm	UA	.500	16.00	61.20	21.10	---	82.30	91.10
16" x 10"	Inst	Ea	Lg	UA	.500	16.00	58.90	21.10	---	80.00	97.60
	Inst	Ea	Sm	UA	.625	12.80	64.20	26.40	---	90.60	102.00
18" x 12"	Inst	Ea	Lg	UA	.667	12.00	60.50	28.10	---	88.60	110.00
	Inst	Ea	Sm	UA	.833	9.60	66.00	35.10	---	101.10	116.00
28" x 16"	Inst	Ea	Lg	UA	1.00	8.00	82.00	42.20	---	124.20	154.00
	Inst	Ea	Sm	UA	1.25	6.40	89.40	52.70	---	142.10	164.00
Mixing box, with electric or pneumatic motor, with silencer											
150 to 250 CFM	Inst	Ea	Lg	UD	1.60	10.00	501.00	58.00	---	559.00	658.00
	Inst	Ea	Sm	UD	2.00	8.00	546.00	72.50	---	618.50	649.00
270 to 600 CFM	Inst	Ea	Lg	UD	2.00	8.00	517.00	72.50	---	589.50	697.00
	Inst	Ea	Sm	UD	2.50	6.40	564.00	90.60	---	654.60	693.00

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
Fans											
Air conditioning or processed air handling											
Axial flow, compact, low sound 2.5" self-propelled											
3,800 CFM, 5 HP	Inst	Ea	Lg	UE	6.67	3.00	3660.00	248.00	---	3908.00	4560.00
	Inst	Ea	Sm	UE	8.33	2.40	3990.00	309.00	---	4299.00	4430.00
15,600 CFM, 10 HP	Inst	Ea	Lg	UE	13.3	1.50	6380.00	494.00	---	6874.00	8040.00
	Inst	Ea	Sm	UE	16.7	1.20	6960.00	620.00	---	7580.00	7840.00
In-line centrifugal, supply/exhaust booster, aluminum wheel/hub, disconnect switch, 1/4" self-propelled											
500 CFM, 10" dia. connect	Inst	Ea	Lg	UE	6.67	3.00	770.00	248.00	---	1018.00	1240.00
	Inst	Ea	Sm	UE	8.33	2.40	840.00	309.00	---	1149.00	1280.00
1,520 CFM, 16" dia. connect	Inst	Ea	Lg	UE	10.0	2.00	1010.00	371.00	---	1381.00	1680.00
	Inst	Ea	Sm	UE	12.5	1.60	1100.00	464.00	---	1564.00	1760.00
3,480 CFM, 20" dia. connect	Inst	Ea	Lg	UE	20.0	1.00	1320.00	742.00	---	2062.00	2570.00
	Inst	Ea	Sm	UE	25.0	0.80	1440.00	928.00	---	2368.00	2760.00
Ceiling fan, right angle, extra quiet 0.10" self-propelled											
200 CFM	Inst	Ea	Lg	UE	1.25	16.00	164.00	46.40	---	210.40	254.00
	Inst	Ea	Sm	UE	1.56	12.80	179.00	57.90	---	236.90	261.00
900 CFM	Inst	Ea	Lg	UE	1.67	12.00	391.00	62.00	---	453.00	537.00
	Inst	Ea	Sm	UE	2.08	9.60	426.00	77.20	---	503.20	536.00
3,000 CFM	Inst	Ea	Lg	UE	2.50	8.00	743.00	92.80	---	835.80	986.00
	Inst	Ea	Sm	UE	3.13	6.40	810.00	116.00	---	926.00	975.00
Exterior wall or roof cap	Inst	Ea	Lg	UA	.667	12.00	108.00	28.10	---	136.10	165.00
	Inst	Ea	Sm	UA	.833	9.60	118.00	35.10	---	153.10	168.00
Roof ventilators, corrosive fume resistant, plastic blades											
Roof ventilator, centrifugal V belt drive motor, 1/4" self-propelled											
250 CFM, 1/4 HP	Inst	Ea	Lg	UE	5.00	4.00	2280.00	186.00	---	2466.00	2890.00
	Inst	Ea	Sm	UE	6.25	3.20	2490.00	232.00	---	2722.00	2820.00
900 CFM, 1/3 HP	Inst	Ea	Lg	UE	6.67	3.00	2480.00	248.00	---	2728.00	3200.00
	Inst	Ea	Sm	UE	8.33	2.40	2700.00	309.00	---	3009.00	3140.00
1,650 CFM, 1/2 HP	Inst	Ea	Lg	UE	8.00	2.50	2940.00	297.00	---	3237.00	3810.00
	Inst	Ea	Sm	UE	10.0	2.00	3210.00	371.00	---	3581.00	3740.00
2,250 CFM, 1 HP	Inst	Ea	Lg	UE	10.0	2.00	3080.00	371.00	---	3451.00	4070.00
	Inst	Ea	Sm	UE	12.5	1.60	3360.00	464.00	---	3824.00	4020.00
Utility set centrifugal V belt drive motor, 1/4" self-propelled											
1,200 CFM, 1/4 HP	Inst	Ea	Lg	UE	5.00	4.00	2280.00	186.00	---	2466.00	2890.00
	Inst	Ea	Sm	UE	6.25	3.20	2490.00	232.00	---	2722.00	2820.00
1,500 CFM, 1/3 HP	Inst	Ea	Lg	UE	6.67	3.00	2310.00	248.00	---	2558.00	3010.00
	Inst	Ea	Sm	UE	8.33	2.40	2520.00	309.00	---	2829.00	2960.00
1,850 CFM, 1/2 HP	Inst	Ea	Lg	UE	8.00	2.50	2310.00	297.00	---	2607.00	3080.00
	Inst	Ea	Sm	UE	10.0	2.00	2520.00	371.00	---	2891.00	3050.00
2,200 CFM, 3/4 HP	Inst	Ea	Lg	UE	10.0	2.00	2340.00	371.00	---	2711.00	3220.00
	Inst	Ea	Sm	UE	12.5	1.60	2550.00	464.00	---	3014.00	3210.00
Direct drive											
320 CFM, 11" x 11" damper	Inst	Ea	Lg	UE	5.00	4.00	276.00	186.00	---	462.00	581.00
	Inst	Ea	Sm	UE	6.25	3.20	301.00	232.00	---	533.00	631.00
600 CFM, 11" x 11" damper	Inst	Ea	Lg	UE	5.00	4.00	304.00	186.00	---	490.00	613.00
	Inst	Ea	Sm	UE	6.25	3.20	331.00	232.00	---	563.00	661.00

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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Ventilation, residential

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Roof-type ventilators

Aluminum dome, damper and curb

6" diameter, 300 CFM	Inst	Ea	Lg	EA	.667	12.00	231.00	27.10	---	258.10	305.00
	Inst	Ea	Sm	EA	.833	9.60	252.00	33.80	---	285.80	301.00
7" diameter, 450 CFM	Inst	Ea	Lg	EA	.727	11.00	252.00	29.50	---	281.50	333.00
	Inst	Ea	Sm	EA	.909	8.80	275.00	36.90	---	311.90	328.00
9" diameter, 900 CFM	Inst	Ea	Lg	EA	.800	10.00	407.00	32.50	---	439.50	515.00
	Inst	Ea	Sm	EA	1.00	8.00	444.00	40.60	---	484.60	503.00
12" diameter, 1,000 CFM	Inst	Ea	Lg	EA	1.00	8.00	250.00	40.60	---	290.60	346.00
	Inst	Ea	Sm	EA	1.25	6.40	272.00	50.80	---	322.80	346.00
16" diameter, 1,500 CFM	Inst	Ea	Lg	EA	1.14	7.00	301.00	46.30	---	347.30	414.00
	Inst	Ea	Sm	EA	1.43	5.60	329.00	58.10	---	387.10	413.00
20" diameter, 2,500 CFM	Inst	Ea	Lg	EA	1.33	6.00	369.00	54.00	---	423.00	502.00
	Inst	Ea	Sm	EA	1.67	4.80	402.00	67.90	---	469.90	500.00
26" diameter, 4,000 CFM	Inst	Ea	Lg	EA	1.60	5.00	446.00	65.00	---	511.00	607.00
	Inst	Ea	Sm	EA	2.00	4.00	486.00	81.30	---	567.30	604.00
32" diameter, 6,500 CFM	Inst	Ea	Lg	EA	2.00	4.00	616.00	81.30	---	697.30	826.00
	Inst	Ea	Sm	EA	2.50	3.20	672.00	102.00	---	774.00	819.00
38" diameter, 8,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	913.00	108.00	---	1021.00	1210.00
	Inst	Ea	Sm	EA	3.33	2.40	996.00	135.00	---	1131.00	1190.00
50" diameter, 13,000 CFM	Inst	Ea	Lg	EA	4.00	2.00	1320.00	163.00	---	1483.00	1750.00
	Inst	Ea	Sm	EA	5.00	1.60	1440.00	203.00	---	1643.00	1730.00

Plastic ABS dome

900 CFM	Inst	Ea	Lg	EA	.667	12.00	73.70	27.10	---	100.80	124.00
	Inst	Ea	Sm	EA	.833	9.60	80.40	33.80	---	114.20	129.00
1,600 CFM	Inst	Ea	Lg	EA	.800	10.00	110.00	32.50	---	142.50	174.00
	Inst	Ea	Sm	EA	1.00	8.00	120.00	40.60	---	160.60	179.00

Wall-type ventilators, one speed, with shutter

12" diameter, 1,000 CFM	Inst	Ea	Lg	EA	.667	12.00	136.00	27.10	---	163.10	196.00
	Inst	Ea	Sm	EA	.833	9.60	149.00	33.80	---	182.80	198.00
14" diameter, 1,500 CFM	Inst	Ea	Lg	EA	.800	10.00	166.00	32.50	---	198.50	238.00
	Inst	Ea	Sm	EA	1.00	8.00	181.00	40.60	---	221.60	240.00
16" diameter, 2,000 CFM	Inst	Ea	Lg	EA	1.00	8.00	250.00	40.60	---	290.60	346.00
	Inst	Ea	Sm	EA	1.25	6.40	272.00	50.80	---	322.80	346.00

Entire structure, wall-type, one speed, with shutter

30" diameter, 4,800 CFM	Inst	Ea	Lg	EA	1.60	5.00	429.00	65.00	---	494.00	588.00
	Inst	Ea	Sm	EA	2.00	4.00	468.00	81.30	---	549.30	586.00
36" diameter, 7,000 CFM	Inst	Ea	Lg	EA	2.00	4.00	468.00	81.30	---	549.30	655.00
	Inst	Ea	Sm	EA	2.50	3.20	510.00	102.00	---	612.00	657.00
42" diameter, 10,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	572.00	108.00	---	680.00	815.00
	Inst	Ea	Sm	EA	3.33	2.40	624.00	135.00	---	759.00	820.00
48" diameter, 16,000 CFM	Inst	Ea	Lg	EA	4.00	2.00	748.00	163.00	---	911.00	1100.00
	Inst	Ea	Sm	EA	5.00	1.60	816.00	203.00	---	1019.00	1110.00
Two speeds, ADD	Inst	Ea	Lg	---	---	---	53.40	---	---	53.40	61.40
	Inst	Ea	Sm	---	---	---	58.20	---	---	58.20	66.90

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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Entire structure, lay-down type, one speed, with shutter

30" diameter, 4,500 CFM	Inst	Ea	Lg	EA	1.33	6.00	468.00	54.00	---	522.00	616.00
	Inst	Ea	Sm	EA	1.67	4.80	510.00	67.90	---	577.90	608.00
36" diameter, 6,500 CFM	Inst	Ea	Lg	EA	1.60	5.00	512.00	65.00	---	577.00	682.00
	Inst	Ea	Sm	EA	2.00	4.00	558.00	81.30	---	639.30	676.00
42" diameter, 9,000 CFM	Inst	Ea	Lg	EA	2.00	4.00	605.00	81.30	---	686.30	814.00
	Inst	Ea	Sm	EA	2.50	3.20	660.00	102.00	---	762.00	807.00
48" diameter, 12,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	798.00	108.00	---	906.00	1070.00
	Inst	Ea	Sm	EA	3.33	2.40	870.00	135.00	---	1005.00	1070.00
Two speeds, ADD	Inst	Ea	Lg	---	---	---	13.10	---	---	13.10	15.10
	Inst	Ea	Sm	---	---	---	14.30	---	---	14.30	16.40
12-hour timer, ADD	Inst	Ea	Lg	EA	.500	16.00	23.70	20.30	---	44.00	56.70
	Inst	Ea	Sm	EA	.625	12.80	25.80	25.40	---	51.20	62.60

Minimum Job Charge

	Inst	Job	Lg	EA	2.29	3.50	---	93.00	---	93.00	135.00
	Inst	Job	Sm	EA	2.86	2.80	---	116.00	---	116.00	168.00

Grilles

Aluminum

Air return

6" x 6"	Inst	Ea	Lg	UA	.333	24.00	10.90	14.00	---	24.90	32.50
	Inst	Ea	Sm	UA	.417	19.20	11.90	17.60	---	29.50	36.90
10" x 6"	Inst	Ea	Lg	UA	.364	22.00	13.30	15.40	---	28.70	37.10
	Inst	Ea	Sm	UA	.455	17.60	14.50	19.20	---	33.70	41.80
16" x 8"	Inst	Ea	Lg	UA	.400	20.00	19.40	16.90	---	36.30	46.20
	Inst	Ea	Sm	UA	.500	16.00	21.10	21.10	---	42.20	51.10
12" x 12"	Inst	Ea	Lg	UA	.500	16.00	19.40	21.10	---	40.50	52.20
	Inst	Ea	Sm	UA	.625	12.80	21.10	26.40	---	47.50	58.50
24" x 12"	Inst	Ea	Lg	UA	.571	14.00	34.70	24.10	---	58.80	74.00
	Inst	Ea	Sm	UA	.714	11.20	37.80	30.10	---	67.90	80.60
48" x 24"	Inst	Ea	Lg	UA	.800	10.00	133.00	33.70	---	166.70	201.00
	Inst	Ea	Sm	UA	1.00	8.00	145.00	42.20	---	187.20	205.00

Minimum Job Charge

	Inst	Job	Lg	UA	2.29	3.50	---	96.60	---	96.60	137.00
	Inst	Job	Sm	UA	2.86	2.80	---	121.00	---	121.00	171.00

Registers, air supply

Ceiling/wall, O.B. damper, anodized aluminum

One- or two-way deflection, adjustable curved face bars

14" x 8"	Inst	Ea	Lg	UA	.500	16.00	23.10	21.10	---	44.20	56.50
	Inst	Ea	Sm	UA	.625	12.80	25.20	26.40	---	51.60	62.60

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
Baseboard, adjustable damper, enameled steel											
10" x 6"	Inst	Ea	Lg	UA	.333	24.00	10.00	14.00	---	24.00	31.50
	Inst	Ea	Sm	UA	.417	19.20	10.90	17.60	---	28.50	35.90
12" x 5"	Inst	Ea	Lg	UA	.364	22.00	10.90	15.40	---	26.30	34.30
	Inst	Ea	Sm	UA	.455	17.60	11.90	19.20	---	31.10	39.10
12" x 6"	Inst	Ea	Lg	UA	.364	22.00	10.00	15.40	---	25.40	33.30
	Inst	Ea	Sm	UA	.455	17.60	10.90	19.20	---	30.10	38.20
12" x 8"	Inst	Ea	Lg	UA	.400	20.00	14.60	16.90	---	31.50	40.70
	Inst	Ea	Sm	UA	.500	16.00	15.90	21.10	---	37.00	45.80
14" x 6"	Inst	Ea	Lg	UA	.444	18.00	10.90	18.70	---	29.60	39.10
	Inst	Ea	Sm	UA	.556	14.40	11.90	23.40	---	35.30	45.20
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	UA	2.29	3.50	---	96.60	---	96.60	137.00
	Inst	Job	Sm	UA	2.86	2.80	---	121.00	---	121.00	171.00

Ventilators

Base, damper, screen; 8" neck diameter

215 CFM @ 5 MPH wind	Inst	Ea	Lg	UD	2.67	6.00	61.10	96.80	---	157.90	208.00
	Inst	Ea	Sm	UD	3.33	4.80	66.60	121.00	---	187.60	238.00

System units complete

Fan coil air conditioning

Cabinet mounted, with filters

Chilled water

0.5 ton cooling	Inst	Ea	Lg	SB	4.00	4.00	792.00	148.00	---	940.00	1120.00
	Inst	Ea	Sm	SB	5.00	3.20	864.00	184.00	---	1048.00	1130.00
1 ton cooling	Inst	Ea	Lg	SB	5.33	3.00	897.00	197.00	---	1094.00	1320.00
	Inst	Ea	Sm	SB	6.67	2.40	978.00	246.00	---	1224.00	1330.00
2.5 ton cooling	Inst	Ea	Lg	SB	8.00	2.00	1620.00	295.00	---	1915.00	2290.00
	Inst	Ea	Sm	SB	10.0	1.60	1770.00	369.00	---	2139.00	2300.00
3 ton cooling	Inst	Ea	Lg	SB	16.0	1.00	1790.00	590.00	---	2380.00	2910.00
	Inst	Ea	Sm	SB	20.0	0.80	1950.00	738.00	---	2688.00	3020.00
10 ton cooling	Inst	Ea	Lg	SF	12.0	2.00	2590.00	469.00	---	3059.00	3650.00
	Inst	Ea	Sm	SF	15.0	1.60	2820.00	586.00	---	3406.00	3670.00
15 ton cooling	Inst	Ea	Lg	SF	16.0	1.50	3600.00	625.00	---	4225.00	5050.00
	Inst	Ea	Sm	SF	20.0	1.20	3930.00	782.00	---	4712.00	5060.00
20 ton cooling	Inst	Ea	Lg	SF	32.0	0.75	4620.00	1250.00	---	5870.00	7130.00
	Inst	Ea	Sm	SF	40.0	0.60	5040.00	1560.00	---	6600.00	7310.00
30 ton cooling	Inst	Ea	Lg	SF	48.0	0.50	6850.00	1880.00	---	8730.00	10600.00
	Inst	Ea	Sm	SF	60.0	0.40	7470.00	2340.00	---	9810.00	10900.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.33	3.00	---	197.00	---	197.00	285.00
	Inst	Job	Sm	SB	6.67	2.40	---	246.00	---	246.00	357.00

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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Heat pumps

Air to air, split system, not including curbs or pads

2 ton cool, 8.5 MBHP heat	Inst	Ea	Lg	SB	16.0	1.00	2260.00	590.00	---	2850.00	3450.00
	Inst	Ea	Sm	SB	20.0	0.80	2460.00	738.00	---	3198.00	3530.00
3 ton cool, 13 MBHP heat	Inst	Ea	Lg	SB	32.0	0.50	2920.00	1180.00	---	4100.00	5060.00
	Inst	Ea	Sm	SB	40.0	0.40	3180.00	1480.00	---	4660.00	5320.00
7.5 ton cool, 33 MBHP heat	Inst	Ea	Lg	SB	48.5	0.33	7070.00	1790.00	---	8860.00	10700.00
	Inst	Ea	Sm	SB	61.5	0.26	7710.00	2270.00	---	9980.00	11000.00
15 ton cool, 64 MBHP heat	Inst	Ea	Lg	SB	64.0	0.25	12700.00	2360.00	---	15060.00	18000.00
	Inst	Ea	Sm	SB	80.0	0.20	13800.00	2950.00	---	16750.00	18100.00

Air to air, single package, not including curbs, pads, or plenums

2 ton cool, 6.5 MBHP heat	Inst	Ea	Lg	SB	12.8	1.25	2720.00	472.00	---	3192.00	3820.00
	Inst	Ea	Sm	SB	16.0	1.00	2970.00	590.00	---	3560.00	3830.00
3 ton cool, 10 MBHP heat	Inst	Ea	Lg	SB	21.3	0.75	3270.00	786.00	---	4056.00	4900.00
	Inst	Ea	Sm	SB	26.7	0.60	3570.00	985.00	---	4555.00	5000.00

Water source to air, single package

1 ton cool, 13 MBHP heat	Inst	Ea	Lg	SB	9.14	1.75	1050.00	337.00	---	1387.00	1690.00
	Inst	Ea	Sm	SB	11.4	1.40	1140.00	421.00	---	1561.00	1750.00
2 ton cool, 19 MBHP heat	Inst	Ea	Lg	SB	10.7	1.50	1320.00	395.00	---	1715.00	2090.00
	Inst	Ea	Sm	SB	13.3	1.20	1440.00	491.00	---	1931.00	2150.00
5 ton cool, 29 MBHP heat	Inst	Ea	Lg	SB	21.3	0.75	2310.00	786.00	---	3096.00	3800.00
	Inst	Ea	Sm	SB	26.7	0.60	2520.00	985.00	---	3505.00	3950.00

Minimum Job Charge

	Inst	Job	Lg	SB	8.00	2.00	---	295.00	---	295.00	428.00
	Inst	Job	Sm	SB	10.0	1.60	---	369.00	---	369.00	535.00

Roof top air conditioners

Standard controls, curb, energy economizer

Single zone, electric-fired cooling, gas-fired heating

3 ton cool, 60 MBHP heat	Inst	Ea	Lg	SB	13.3	1.20	4370.00	491.00	---	4861.00	5740.00
	Inst	Ea	Sm	SB	16.7	0.96	4770.00	616.00	---	5386.00	5660.00
4 ton cool, 95 MBHP heat	Inst	Ea	Lg	SB	16.0	1.00	4540.00	590.00	---	5130.00	6070.00
	Inst	Ea	Sm	SB	20.0	0.80	4950.00	738.00	---	5688.00	6020.00
10 ton cool, 200 MBHP heat	Inst	Ea	Lg	SF	60.0	0.40	10200.00	2340.00	---	12540.00	15200.00
	Inst	Ea	Sm	SF	75.0	0.32	11200.00	2930.00	---	14130.00	15400.00
30 ton cool, 540 MBHP heat	Inst	Ea	Lg	SG	160	0.20	31500.00	6430.00	---	37930.00	45500.00
	Inst	Ea	Sm	SG	200	0.16	34300.00	8040.00	---	42340.00	46000.00
40 ton cool, 675 MBHP heat	Inst	Ea	Lg	SG	200	0.16	40900.00	8040.00	---	48940.00	58700.00
	Inst	Ea	Sm	SG	246	0.13	44600.00	9880.00	---	54480.00	59000.00
50 ton cool, 810 MBHP heat	Inst	Ea	Lg	SG	267	0.12	49600.00	10700.00	---	60300.00	72600.00
	Inst	Ea	Sm	SG	320	0.10	54100.00	12900.00	---	67000.00	72800.00

Single zone, gas-fired cooling and heating

3 ton cool, 90 MBHP heat	Inst	Ea	Lg	SB	16.0	1.00	5450.00	590.00	---	6040.00	7120.00
	Inst	Ea	Sm	SB	20.0	0.80	5940.00	738.00	---	6678.00	7010.00

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
Multizone, electric-fired cooling, gas-fired cooling											
20 ton cool, 360 MBHP heat	Inst	Ea	Lg	SG	160	0.20	49200.00	6430.00	---	55630.00	65900.00
	Inst	Ea	Sm	SG	200	0.16	53600.00	8040.00	---	61640.00	65300.00
30 ton cool, 540 MBHP heat	Inst	Ea	Lg	SG	229	0.14	61600.00	9200.00	---	70800.00	84200.00
	Inst	Ea	Sm	SG	291	0.11	67200.00	11700.00	---	78900.00	84200.00
70 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	400	0.08	116000.00	16100.00	---	132100.00	156000.00
	Inst	Ea	Sm	SG	533	0.06	126000.00	21400.00	---	147400.00	157000.00
80 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	457	0.07	132000.00	18400.00	---	150400.00	178000.00
	Inst	Ea	Sm	SG	533	0.06	144000.00	21400.00	---	165400.00	175000.00
105 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	640	0.05	173000.00	25700.00	---	198700.00	237000.00
	Inst	Ea	Sm	SG	800	0.04	189000.00	32100.00	---	221100.00	236000.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.00	3.20	---	184.00	---	184.00	267.00
	Inst	Job	Sm	SB	6.25	2.56	---	231.00	---	231.00	334.00

Window unit air conditioners

Semi-permanent installation, 3-speed fan, 125-volt GFI receptacle, energy-efficient models

6,000 BTUH (0.5 ton cool)	Inst	Ea	Lg	EB	4.00	4.00	572.00	163.00	---	735.00	893.00
	Inst	Ea	Sm	EB	5.00	3.20	624.00	203.00	---	827.00	919.00
9,000 BTUH (0.75 ton cool)	Inst	Ea	Lg	EB	4.00	4.00	630.00	163.00	---	793.00	960.00
	Inst	Ea	Sm	EB	5.00	3.20	688.00	203.00	---	891.00	982.00
12,000 BTUH (1.0 ton cool)	Inst	Ea	Lg	EB	4.00	4.00	732.00	163.00	---	895.00	1080.00
	Inst	Ea	Sm	EB	5.00	3.20	798.00	203.00	---	1001.00	1090.00
18,000 BTUH (1.5 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	974.00	217.00	---	1191.00	1430.00
	Inst	Ea	Sm	EB	6.67	2.40	1060.00	271.00	---	1331.00	1450.00
24,000 BTUH (2.0 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	1100.00	217.00	---	1317.00	1580.00
	Inst	Ea	Sm	EB	6.67	2.40	1200.00	271.00	---	1471.00	1590.00
36,000 BTUH (3.0 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	1430.00	217.00	---	1647.00	1960.00
	Inst	Ea	Sm	EB	6.67	2.40	1560.00	271.00	---	1831.00	1950.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	EA	2.67	3.00	---	108.00	---	108.00	157.00
	Inst	Job	Sm	EA	3.33	2.40	---	135.00	---	135.00	196.00

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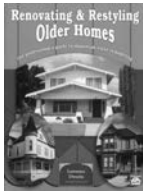
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Practical References for Builders

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640 pages, 8½ x 11, \$69.00

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Home Building Mistakes & Fixes

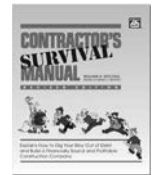


This is an encyclopedia of practical fixes for real-world home building and repair problems. There's never an end to "surprises" when you're in the business of building and fixing homes, yet there's little published on how to deal with construction that went wrong — where out-of-square or non-standard or jerry-rigged turns what should be a simple job into a nightmare. This manual describes jaw-dropping building mistakes that actually occurred, from disastrous misunderstandings over property lines, through basement floors leveled with an out-of-level instrument, to a house collapse when a siding crew removed the old siding. You'll learn the pitfalls the painless way, and real-world working solutions for the problems every contractor finds in a home building or repair jobsite. Includes dozens of those "surprises" and the author's step-by-step, clearly illustrated tips, tricks and workarounds for dealing with them.

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How to tackle problems that are unique to additions, such as requirements for basement conversions, reinforcing ceiling joists for second-story conversions, handling problems in attic conversions, what's required for footings, foundations, and slabs, how to design the best bathroom for the space, and much more. Besides actual construction, you'll even find help in designing, planning, and estimating your room addition jobs.

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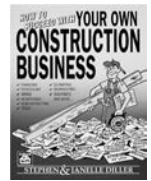
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National Painting Cost Estimator

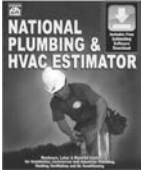
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480 pages, 8½ x 11, \$98.25. Revised annually

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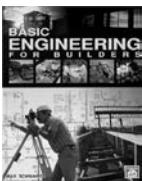
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Ceramic Tile Essentials Quick-Cards

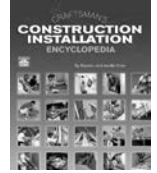
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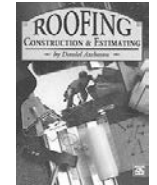


Step-by-step installation instructions for just about any residential construction, remodeling or repair task, arranged alphabetically, from Acoustic tile to Wood flooring. Includes hundreds of illustrations that show how to build, install, or remodel each part of the job, as well as manhour tables for each work item so you can estimate and bid with confidence. Also includes a CD-ROM with all the material in the book, handy look-up features, and the ability to capture and print out for your crew the instructions and diagrams for any job.

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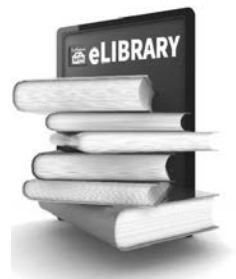
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