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2016 NATIONAL REPAIR & REMODELING ESTIMATOR

by Albert S. Paxton
General editor - Joshua 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.

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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 2016. 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.

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

Special thanks to: Dal-Tile Corporation, 1713 Stewart, Santa Monica, California

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 indi-

viduals. 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 Northridge earthquake in California, Hurricanes Charley, Frances, Ivan and Jeanne striking Florida and the southeastern states, the catastrophic Hurricane Katrina, whose impact on the Gulf Coast is still being felt in the building and repair industry, Hurricanes Dolly and Ike, and the cleanup, repair and rebuilding of the massive destruction of Superstorm Sandy.

Main Subject Index

Abbreviations	20	Insulation	268
Acoustical treatment	21	Batt or roll / Loose fill / Rigid	
Adhesives	24	Lighting fixtures	278
Air conditioning and ventilating systems .	28	Indoor / Outdoor	
Bath accessories	38	Mantels, fireplace	281
Bathtubs (includes whirlpool)	44	Masonry	282
Cabinets	60	Brick / Concrete block / Glass block	
Kitchen / Vanity		Glazed tile / Quarry tile / Veneer	
Canopies	75	Medicine cabinets	41
Carpet	78	Molding and trim	298
Caulking	80	Pine / Oak / Redwood / Resin	
Ceramic tile	83	Painting and cleaning	326
Countertop / Floors / Walls		Interior / Exterior	
Closet door systems	86	Paneling	340
Bi-folding / Mirror / Sliding		Plaster and stucco	344
Columns	94	Range hoods	348
Concrete, cast-in-place	96	Resilient flooring	350
Footings / Forms / Foundations / Reinforcing		Linoleum / Tile / Vinyl	
Countertops	106	Roofing	356
Ceramic tile / Concrete / Engineered stone /		Aluminum / Built-up / Clay tile / Composition	
Formica / Granite / Quartz / Wood		Mineral surface / Wood shakes or shingles	
Cupolas	112	Sheet metal	372
Demolition	114	Flashing / Gravel stop / Roof edging / Vents	
Concrete / Masonry / Rough carpentry		Shower and tub doors	376
Dishwashers	130	Shower bases or receptors	381
Door frames	132	Shower stalls	383
Door hardware	134	Shower tub units	386
Doors	136	Shutters	387
Exterior / Interior		Siding	390
Drywall	153	Aluminum / Hardboard / Vinyl / Wood	
Electrical	155	Sinks	402
Entrances	160	Bathroom / Kitchen / Utility	
Excavation	160	Skylights	425
Fences	162	Spas	431
Board / Chain link / Gates / Split rail		Stairs	434
Fiberglass panels	168	Stair parts / Shop fabricated stairs	
Fireplaces	170	Suspended ceilings	438
Food centers	172	Toilets, bidets, urinals	442
Framing (rough carpentry)	173	Trash compactors	448
Beams / Joists / Rafters / Trusses		Ventilation	449
Garage door operators	224	Flue piping / Chimney vent	
Garage doors	221	Wallpaper	452
Garbage disposers	225	Water filters	453
Glass and glazing	227	Water heaters	454
Glu-lam products	230	Electric / Gas / Solar	
Beams / Purlins / Sub-purlins / Ledgers		Water softeners	462
Gutters and downspouts	255	Windows	463
Hardwood flooring	258	Aluminum / Horizontal slide / Wood / Garden	
Block / Parquetry / Strip		Index	499
Heating	261		
Boilers / Forced air / Space heaters			

How to Use This Book

1	2	3	4	5	6	7	8	9	10	11	12
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 pumps 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.costbook.com and click the ShowMe tutorial link to view an interactive tutorial for *National Estimator*.

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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.
11. If the amount of insurance required is based on actual cash value, circle ACV and insert the percent required by the policy, if any.
Note: (regarding 10 and 11) if there is a non-concurrency, i.e., one insurer requires insurance to 90% of value while another requires insurance to 80% of value, make a note here. Comment on the non-concurrency in the settlement report.
12. The installed price and/or material price only, as expressed in columns 13 through 15, may include any of the following (expressed in units and unit prices):
 - Material only (no labor)
 - Material and labor to replace
 - Material and labor to remove and replace

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

[illegible]

Wage Rates Used in This Book

Wage rates listed here and used in this book were compiled in the fall of 2015 and projected to mid-2016. 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 5.46% of the Base Wage Per Hour. This amount is paid by the Employer in addition to the Base Wage Per Hour.

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

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

"Non-Taxable Fringe Benefits" (Col. 5) include employer-sponsored medical insurance and other benefits, which nationally average 4.82% of the Base Wage Per Hour.

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

	1	2	3	4	5	6
	Base Wage Per Hour	Taxable Fringe Benefits (5.46% of Base Wage)	Liability Insurance & Employer Taxes %	\$	Non-Taxable Fringe Benefits (4.82% of Base Wage)	Total Hourly Cost Used in This Book
Trade						
Air Tool Operator	\$31.21	\$1.70	26.22%	\$8.63	\$1.50	\$43.04
Bricklayer or Stone Mason	\$27.06	\$1.48	25.34%	\$7.23	\$1.30	\$37.07
Bricktender	\$20.06	\$1.10	25.34%	\$5.36	\$0.97	\$27.49
Carpenter	\$25.46	\$1.39	31.63%	\$8.49	\$1.23	\$36.57
Cement Mason	\$25.74	\$1.41	23.15%	\$6.29	\$1.24	\$34.68
Drywall Installer	\$26.33	\$1.44	23.57%	\$6.55	\$1.27	\$35.59
Drywall Taper	\$26.29	\$1.44	23.57%	\$6.54	\$1.27	\$35.54
Electrician, Journeyman Wireman	\$30.20	\$1.65	19.84%	\$6.32	\$1.46	\$39.63
Equipment Operator	\$30.45	\$1.66	25.22%	\$8.10	\$1.47	\$41.68
Fence Erector	\$27.50	\$1.50	26.01%	\$7.54	\$1.33	\$37.87
Floorlayer: Carpet, Linoleum, Soft Tile	\$24.69	\$1.35	23.82%	\$6.20	\$1.19	\$33.43
Floorlayer, Hardwood	\$25.92	\$1.42	23.82%	\$6.51	\$1.25	\$35.10
Glazier	\$25.68	\$1.40	25.78%	\$6.98	\$1.24	\$35.30
Laborer, General Construction	\$20.47	\$1.12	32.73%	\$7.07	\$0.99	\$29.65
Lather	\$26.43	\$1.44	21.28%	\$5.93	\$1.27	\$35.07
Marble Setter	\$24.43	\$1.33	21.36%	\$5.50	\$1.18	\$32.44
Millwright / Finish Carpenter	\$25.90	\$1.41	21.24%	\$5.80	\$1.25	\$34.36
Mosaic and Terrazzo Setter	\$25.96	\$1.42	21.36%	\$5.85	\$1.25	\$34.48
Mosaic and Terrazzo Setter Helper	\$19.86	\$1.08	21.36%	\$4.47	\$0.96	\$26.37
Painter, Brush	\$27.32	\$1.49	24.88%	\$7.17	\$1.32	\$37.30
Painter, Spray-Gun	\$28.14	\$1.54	24.88%	\$7.38	\$1.36	\$38.42
Paperhanger	\$28.69	\$1.57	24.88%	\$7.53	\$1.38	\$39.17
Plasterer	\$26.07	\$1.42	28.58%	\$7.86	\$1.26	\$36.61
Plasterer Helper	\$20.44	\$1.12	28.58%	\$6.16	\$0.99	\$28.71
Plumber	\$31.21	\$1.70	24.27%	\$7.99	\$1.50	\$42.40
Reinforcing Ironworker	\$27.36	\$1.49	28.61%	\$8.25	\$1.32	\$38.42
Roofer, Foreman	\$28.67	\$1.57	44.14%	\$13.35	\$1.38	\$44.97
Roofer, Journeyman	\$26.06	\$1.42	44.14%	\$12.13	\$1.26	\$40.87
Roofer, Hot Mop Pitch	\$26.84	\$1.47	44.14%	\$12.50	\$1.29	\$42.10
Roofer, Wood Shingles	\$27.36	\$1.49	44.14%	\$12.74	\$1.32	\$42.91
Sheet Metal Worker	\$29.89	\$1.63	26.01%	\$8.20	\$1.44	\$41.16
Tile Setter	\$26.20	\$1.43	21.36%	\$5.90	\$1.26	\$34.79
Tile Setter Helper	\$19.86	\$1.08	21.36%	\$4.47	\$0.96	\$26.37
Truck Driver	\$22.04	\$1.20	26.22%	\$6.09	\$1.06	\$30.39

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.....-3%
Anniston	362.....-8%	Inglewood	902-9059%
Auburn	368.....-5%	Irvine	926-92713%
Bellamy	369.....1%	Lompoc	934.....3%
Birmingham	350-3522%	Long Beach	907-9089%
Dothan	363.....-6%	Los Angeles	900-9018%
Evergreen	364.....-11%	Marysville	959.....-3%
Gadsden	359.....-11%	Modesto	953.....1%
Huntsville	358.....-1%	Mojave	935.....5%
Jasper	355.....-9%	Novato	949.....11%
Mobile	365-366-2%	Oakland	945-94717%
Montgomery	360-361-1%	Orange	928.....11%
Scottsboro	357.....-4%	Oxnard	930.....2%
Selma	367.....-5%	Pasadena	910-9129%
Sheffield	356.....0%	Rancho Cordova	956-9574%
Tuscaloosa	354.....-4%	Redding	960.....-3%
Alaska Average	22%	Richmond	948.....17%
Anchorage	995.....27%	Riverside	925.....4%
Fairbanks	997.....27%	Sacramento	958.....3%
Juneau	998.....20%	Salinas	939.....1%
Ketchikan	999.....15%	San Bernardino	923-9242%
King Salmon	996.....23%	San Diego	919-9218%
Arizona Average	-4%	San Francisco	941.....27%
Chambers	865.....-8%	San Jose	950-95117%
Douglas	855.....-7%	San Mateo	943-94421%
Flagstaff	860.....-7%	Santa Barbara	931.....7%
Kingman	864.....-5%	Santa Rosa	954.....5%
Mesa	852.....3%	Stockton	952.....4%
Phoenix	850.....3%	Sunnyvale	940.....20%
Prescott	863.....-6%	Van Nuys	913-9168%
Show Low	859.....-8%	Whittier	906.....8%
Tucson	856-857-5%	Colorado Average	1%
Yuma	853.....2%	Aurora	800-8017%
Arkansas Average	-6%	Boulder	803-8044%
Batesville	725.....-9%	Colorado	
Camden	717.....-2%	Springs	808-8090%
Fayetteville	727.....-4%	Denver	802.....7%
Fort Smith	729.....-7%	Durango	813.....-1%
Harrison	726.....-12%	Fort Morgan	807.....-2%
Hope	718.....-4%	Glenwood	
Hot Springs	719.....-13%	Springs	816.....4%
Jonesboro	724.....-9%	Grand Junction	814-8150%
Little Rock	720-722-3%	Greeley	806.....5%
Pine Bluff	716.....-6%	Longmont	805.....3%
Russellville	728.....-4%	Pagosa Springs	811.....-4%
West Memphis	723.....-3%	Pueblo	810.....0%
California Average	7%	Salida	812.....-6%
Alhambra	917-9188%	Connecticut Average	10%
Bakersfield	932-9332%	Bridgeport	066.....10%
El Centro	922.....0%	Bristol	060.....12%
Eureka	955.....-5%	Fairfield	064.....12%
Fresno	936-938-2%	Hartford	061.....12%
		New Haven	065.....11%

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	063.....5%	Hawaii	22%
Stamford	068-06915%	Aliamanu	968.....23%
Waterbury	067.....10%	Ewa	967.....21%
West Hartford	062.....6%	Halawa Heights	967.....21%
Delaware	2%	Hilo	967.....21%
Dover	199.....-4%	Honolulu	968.....23%
Newark	197.....6%	Kailua	968.....23%
Wilmington	198.....4%	Lualualei	967.....21%
District of Columbia	12%	Mililani Town	967.....21%
Washington	200-20512%	Pearl City	967.....21%
Florida	-6%	Wahiawa	967.....21%
Altamonte		Waianae	967.....21%
Springs	327.....-4%	Wailuku (Maui)	967.....21%
Bradenton	342.....-6%	Idaho	-9%
Brooksville	346.....-8%	Boise	837.....-5%
Daytona Beach	321.....-10%	Coeur d'Alene	838.....-10%
Fort Lauderdale	333.....2%	Idaho Falls	834.....-9%
Fort Myers	339.....-7%	Lewiston	835.....-11%
Fort Pierce	349.....-11%	Meridian	836.....-9%
Gainesville	326.....-9%	Pocatello	832.....-10%
Jacksonville	322.....-2%	Sun Valley	833.....-8%
Lakeland	338.....-8%	Illinois	4%
Melbourne	329.....-8%	Arlington Heights	60014%
Miami	330-3320%	Aurora	60514%
Naples	341.....-3%	Belleville	6220%
Ocala	344.....-12%	Bloomington	617-1%
Orlando	328.....0%	Carbondale	629-4%
Panama City	324.....-11%	Carol Stream	60114%
Pensacola	325.....-8%	Centralia	628-3%
Saint Augustine	320.....-5%	Champaign	618-2%
Saint Cloud	347.....-3%	Chicago	606-60815%
St Petersburg	337.....-6%	Decatur	623-7%
Tallahassee	323.....-7%	Galesburg	614-4%
Tampa	335-336-1%	Granite City	6203%
W. Palm Beach	334.....-2%	Green River	6124%
Georgia	-4%	Joliet	60414%
Albany	317.....-7%	Kankakee	609-1%
Athens	306.....-5%	Lawrenceville	624-6%
Atlanta	303.....12%	Oak Park	60318%
Augusta	308-309-2%	Peoria	615-6166%
Buford	305.....-2%	Peru	6132%
Calhoun	307.....-9%	Quincy	60216%
Columbus	318-319-4%	Rockford	610-6113%
Dublin/Fort Valley	310.....-8%	Springfield	625-6270%
Hinesville	313.....-6%	Urbana	619-4%
Kings Bay	315.....-8%	Indiana	-2%
Macon	312.....-4%	Aurora	470.....-5%
Marietta	300-3024%	Bloomington	474.....-2%
Savannah	314.....-4%	Columbus	472.....-4%
Statesboro	304.....-11%	Elkhart	465.....-4%
Valdosta	316.....-1%	Evansville	476-4774%

Fort Wayne	467-468	-2%	Maine		-5%	Meridian	393	-2%	Gallup	873	-7%
Gary	463-464	16%	Auburn	042	-4%	Tupelo	388	-7%	Holman	877	-10%
Indianapolis	460-462	4%	Augusta	043	-7%	Missouri		-4%	Las Cruces	880	-10%
Jasper	475	-7%	Bangor	044	-6%	Cape Girardeau	637	-5%	Santa Fe	875	-8%
Jeffersonville	471	-6%	Bath	045	-6%	Caruthersville	638	-7%	Socorro	878	-16%
Kokomo	469	-8%	Brunswick	039-040	-1%	Chillicothe	646	-5%	Truth or Consequences	879	-12%
Lafayette	479	-5%	Camden	048	-10%	Columbia	652	-4%	Tucumcari	884	-9%
Muncie	473	-8%	Cutler	046	-8%	East Lynne	647	-2%	Nevada		2%
South Bend	466	-2%	Dexter	049	-6%	Farmington	636	-8%	Carson City	897	-4%
Terre Haute	478	-3%	Northern Area	047	-8%	Hannibal	634	-2%	Elko	898	18%
Iowa		-3%	Portland	041	2%	Independence	640	5%	Ely	893	-3%
Burlington	526	0%	Maryland		2%	Jefferson City	650-651	-5%	Fallon	894	0%
Carroll	514	-11%	Annapolis	214	8%	Joplin	648	-6%	Las Vegas	889-891	3%
Cedar Falls	506	-4%	Baltimore	210-212	7%	Kansas City	641	6%	Reno	895	-1%
Cedar Rapids	522-524	2%	Bethesda	208-209	13%	Kirksville	635	-15%	New York		8%
Cherokee	510	0%	Church Hill	216	-4%	Knob Noster	653	-3%	Albany	120-123	7%
Council Bluffs	515	-1%	Cumberland	215	-8%	Lebanon	654-655	-12%	Amityville	117	13%
Creston	508	-6%	Elkton	219	-5%	Poplar Bluff	639	-10%	Batavia	140	1%
Davenport	527-528	1%	Frederick	217	7%	Saint Charles	633	1%	Binghamton	137-139	-2%
Decorah	521	-8%	Laurel	206-207	8%	Saint Joseph	644-645	-1%	Bronx	104	14%
Des Moines	500-503	5%	Salisbury	218	-6%	Springfield	656-658	-8%	Brooklyn	112	12%
Dubuque	520	-4%	Massachusetts		12%	St Louis	630-631	8%	Buffalo	142	2%
Fort Dodge	505	-3%	Ayer	015-016	6%	Montana		-4%	Elmira	149	-3%
Mason City	504	-3%	Bedford	017	16%	Billings	590-591	-2%	Flushing	113	21%
Ottumwa	525	-6%	Boston	021-022	37%	Butte	597	-3%	Garden City	115	20%
Sheldon	512	-7%	Brockton	023-024	20%	Fairview	592	6%	Hicksville	118	18%
Shenandoah	516	-14%	Cape Cod	026	4%	Great Falls	594	-6%	Ithaca	148	-5%
Sioux City	511	5%	Chicopee	010	7%	Havre	595	-9%	Jamaica	114	20%
Spencer	513	-7%	Dedham	019	18%	Helena	596	-2%	Jamestown	147	-7%
Waterloo	507	-3%	Fitchburg	014	11%	Kalispell	599	-6%	Kingston	124	-4%
Kansas		-4%	Hingham	020	19%	Miles City	593	-7%	Long Island	111	34%
Colby	677	-8%	Lawrence	018	14%	Missoula	598	-6%	Montauk	119	11%
Concordia	669	-12%	Nantucket	025	9%	Nebraska		-8%	New York (Manhattan)	100	35%
Dodge City	678	-4%	New Bedford	027	8%	Alliance	693	-10%	New York City	100-102	35%
Emporia	668	-2%	Northfield	013	2%	Columbus	686	-7%	Newcomb	128	0%
Fort Scott	667	-6%	Pittsfield	012	1%	Grand Island	688	-8%	Niagara Falls	143	-6%
Hays	676	-13%	Springfield	011	8%	Hastings	689	-9%	Plattsburgh	129	-1%
Hutchinson	675	-6%	Michigan		1%	Lincoln	683-685	-4%	Poughkeepsie	125-126	1%
Independence	673	3%	Battle Creek	490-491	-1%	McCook	690	-10%	Queens	110	23%
Kansas City	660-662	5%	Detroit	481-482	7%	Norfolk	687	-10%	Rochester	144-146	2%
Liberal	679	-3%	Flint	484-485	-4%	North Platte	691	-8%	Rockaway	116	16%
Salina	674	-7%	Grand Rapids	493-495	1%	Omaha	680-681	0%	Rome	133-134	-4%
Topeka	664-666	-1%	Grayling	497	-7%	Valentine	692	-15%	Staten Island	103	13%
Wichita	670-672	-4%	Jackson	492	-1%	New Hampshire		-1%	Stewart	127	-5%
Kentucky		-4%	Lansing	488-489	0%	Charlestown	036	-5%	Syracuse	130-132	2%
Ashland	411-412	-4%	Marquette	498-499	3%	Concord	034	-3%	Tonawanda	141	-1%
Bowling Green	421	-5%	Pontiac	483	12%	Dover	038	1%	Utica	135	-6%
Campton	413-414	-11%	Royal Oak	480	7%	Lebanon	037	-3%	Watertown	136	-1%
Covington	410	2%	Saginaw	486-487	-5%	Littleton	035	-6%	West Point	109	7%
Elizabethtown	427	-10%	Traverse City	496	-2%	Manchester	032-033	2%	White Plains	105-108	17%
Frankfort	406	3%	Minnesota		1%	New Boston	030-031	3%	North Carolina		-4%
Hazard	417-418	-9%	Bemidji	566	-6%	New Jersey		12%	Asheville	287-289	-7%
Hopkinsville	422	-5%	Brainerd	564	-3%	Atlantic City	080-084	8%	Charlotte	280-282	7%
Lexington	403-405	1%	Duluth	556-558	2%	Brick	087	3%	Durham	277	0%
London	407-409	-7%	Fergus Falls	565	-10%	Dover	078	13%	Elizabeth City	279	-8%
Louisville	400-402	2%	Magnolia	561	-8%	Edison	088-089	15%	Fayetteville	283	-6%
Owensboro	423	-4%	Mankato	560	-4%	Hackensack	076	13%	Goldsboro	275	0%
Paducah	420	0%	Minneapolis	553-555	13%	Monmouth	077	14%	Greensboro	274	-3%
Pikeville	415-416	-8%	Rochester	559	-1%	Newark	071-073	14%	Hickory	286	-8%
Somerset	425-426	-11%	St Cloud	563	2%	Passaic	070	14%	Kinston	285	-9%
White Plains	424	-4%	St Paul	550-551	12%	Paterson	074-075	12%	Raleigh	276	3%
Louisiana		0%	Thief River Falls	567	-2%	Princeton	085	13%	Rocky Mount	278	-6%
Alexandria	713-714	-3%	Willmar	562	-5%	Summit	079	19%	Wilmington	284	-6%
Baton Rouge	707-708	10%	Mississippi		-7%	Trenton	086	11%	Winston-Salem	270-273	-5%
Houma	703	4%	Clarksdale	386	-9%	New Mexico		-8%	North Dakota		4%
Lafayette	705	1%	Columbus	397	0%	Alamogordo	883	-12%	Bismarck	585	3%
Lake Charles	706	4%	Greenville	387	-14%	Albuquerque	870-871	-3%	Dickinson	586	13%
Mandeville	704	-2%	Greenwood	389	-10%	Clovis	881	-11%	Fargo	580-581	1%
Minden	710	-5%	Gulfport	395	-4%	Farmington	874	-1%	Grand Forks	582	-1%
Monroe	712	-8%	Jackson	390-392	-3%	Fort Sumner	882	-2%			
New Orleans	700-701	2%	Laurel	394	-7%						
Shreveport	711	-4%	McComb	396	-11%						

Jamestown	584.....-4%	New Castle	161.....-3%	Greenville	754.....3%	Fairmont	266.....-11%
Minot	587.....9%	Philadelphia	190-19111%	Houston	770-77215%	Huntington	255-257-4%
Nekoma	583.....-10%	Pittsburgh	152.....6%	Huntsville	773.....15%	Lewisburg	249.....-14%
Williston	588.....21%	Pottsville	179.....-8%	Longview	756.....1%	Martinsburg	254.....-5%
Ohio	0%	Punxsutawney	157.....-3%	Lubbock	793-794-7%	Morgantown	265.....-4%
Akron	442-4431%	Reading	195-1962%	Lufkin	759.....-4%	New Martinsville	262.....-9%
Canton	446-447-3%	Scranton	184-1851%	McAllen	785.....-13%	Parkersburg	261.....2%
Chillicothe	456.....-2%	Somerset	155.....-9%	Midland	797.....10%	Romney	267.....-7%
Cincinnati	450-4523%	Southeastern	193.....9%	Palestine	758.....-4%	Sugar Grove	268.....-8%
Cleveland	440-4413%	Uniontown	154.....-6%	Plano	750.....6%	Wheeling	260.....3%
Columbus	432.....5%	Valley Forge	194.....11%	San Angelo	769.....-6%	Wisconsin	0%
Dayton	453-4551%	Warminster	189.....11%	San Antonio	780-7821%	Amery	540.....-1%
Lima	458.....-5%	Warrendale	150-1515%	Texarkana	755.....-8%	Beloit	535.....5%
Marietta	457.....-5%	Washington	153.....9%	Tyler	757.....-7%	Clam Lake	545.....-8%
Marion	433.....-5%	Wilkes Barre	186-187-1%	Victoria	779.....0%	Eau Claire	547.....-2%
Newark	430-4313%	Williamsport	177.....-2%	Waco	765-767-3%	Green Bay	541-5433%
Sandusky	448-449-2%	York	173-174-1%	Wichita Falls	763.....-9%	La Crosse	546.....0%
Steubenville	439.....1%	Rhode Island	5%	Woodson	764.....-4%	Ladysmith	548.....-1%
Toledo	434-4367%	Bristol	028.....5%	Utah	-4%	Madison	537.....8%
Warren	444.....-5%	Coventry	028.....5%	Clearfield	840.....0%	Milwaukee	530-5346%
Youngstown	445.....-2%	Cranston	029.....6%	Green River	845.....-3%	Oshkosh	549.....4%
Zanesville	437-438-1%	Davisville	028.....5%	Ogden	843-844-9%	Portage	539.....2%
Oklahoma	-5%	Narragansett	028.....5%	Provo	846-847-7%	Prairie du Chien	538.....-7%
Adams	739.....-10%	Newport	028.....5%	Salt Lake City	841.....1%	Wausau	544.....-3%
Ardmore	734.....-2%	Providence	029.....6%	Vermont	-5%	Wyoming	-1%
Clinton	736.....-3%	Warwick	028.....5%	Albany	058.....-7%	Casper	826.....1%
Durant	747.....-11%	South Carolina	-3%	Battleboro	053.....-4%	Cheyenne/	
Enid	737.....-4%	Aiken	298.....4%	Beecher Falls	059.....-8%	Laramie	820.....-2%
Lawton	735.....-10%	Beaufort	299.....-4%	Bennington	052.....-7%	Gillette	827.....3%
McAlester	745.....-7%	Charleston	294.....-1%	Burlington	054.....3%	Powell	824.....-6%
Muskogee	744.....-8%	Columbia	290-292-3%	Montpelier	056.....-4%	Rawlins	823.....6%
Norman	730.....-4%	Greenville	296.....-1%	Rutland	057.....-7%	Riverton	825.....-6%
Oklahoma City	731.....-3%	Myrtle Beach	295.....-8%	Springfield	051.....-6%	Rock Springs	829-8311%
Ponca City	746.....-1%	Rock Hill	297.....-6%	White River		Sheridan	828.....-3%
Poteau	749.....-8%	Spartanburg	293.....-3%	Junction	050.....-5%	Wheatland	822.....-5%
Pryor	743.....-6%	South Dakota	-7%	Virginia	-4%	CANADIAN AREA	MODIFIERS
Shawnee	748.....-9%	Aberdeen	574.....-7%	Abingdon	242.....-9%	These figures assume an	
Tulsa	740-7410%	Mitchell	573.....-6%	Alexandria	220-22310%	exchange rate of \$1.00 Canadian	
Woodward	738.....5%	Mobridge	576.....-9%	Charlottesville	229.....-6%	to \$0.76 U.S.	
Oregon	-4%	Pierre	575.....-11%	Chesapeake	233.....-4%	Alberta	13%
Adrian	979.....-12%	Rapid City	577.....-8%	Culpeper	227.....-4%	Calgary	14%
Bend	977.....-6%	Sioux Falls	570-571-1%	Farmville	239.....-12%	Edmonton	14%
Eugene	974.....-3%	Watertown	572.....-6%	Fredericksburg	224-225-5%	Fort McMurray	12%
Grants Pass	975.....-5%	Tennessee	-2%	Galax	243.....-10%	British Columbia	7%
Klamath Falls	976.....-8%	Chattanooga	374.....2%	Harrisonburg	228.....-6%	Fraser Valley	6%
Pendleton	978.....-3%	Clarksville	370.....1%	Lynchburg	245.....-8%	Okanagan	6%
Portland	970-97210%	Cleveland	373.....-1%	Norfolk	235-237-2%	Vancouver	9%
Salem	973.....-2%	Columbia	384.....-7%	Petersburg	238.....-3%	Manitoba Average	0%
Pennsylvania	-1%	Cookeville	385.....-8%	Radford	241.....-9%	North Manitoba	0%
Allentown	181.....3%	Jackson	383.....-2%	Reston	201.....7%	South Manitoba	0%
Altoona	166.....-8%	Kingsport	376.....-5%	Richmond	232.....2%	Selkirk	0%
Beaver Springs	178.....-5%	Knoxville	377-379-2%	Roanoke	240.....-9%	Winnipeg	0%
Bethlehem	180.....4%	McKenzie	382.....-8%	Staunton	244.....-7%	New Brunswick	-13%
Bradford	167.....-8%	Memphis	380-3811%	Tazewell	246.....-6%	Moncton	-13%
Butler	160.....-2%	Nashville	371-3723%	Virginia Beach	234.....-2%	Nova Scotia	-8%
Chambersburg	172.....-7%	Texas	0%	Williamsburg	230-231-3%	Amherst	-8%
Clearfield	168.....-3%	Abilene	795-796-2%	Winchester	226.....-3%	Nova Scotia	-7%
DuBois	158.....-10%	Amarillo	790-791-2%	Washington	0%	Sydney	-8%
East Stroudsburg	183.....-5%	Arlington	760.....1%	Clarkston	994.....-8%	Newfoundland/	
Erie	164-165-6%	Austin	786-7875%	Everett	982.....2%	Labrador	-3%
Genesee	169.....-4%	Bay City	774.....27%	Olympia	985.....-2%	Ontario	7%
Greensburg	156.....-4%	Beaumont	776-7777%	Pasco	993.....1%	London	7%
Harrisburg	170-1713%	Brownwood	768.....-8%	Seattle	980-98111%	Thunder Bay	6%
Hazleton	182.....-3%	Bryan	778.....-3%	Spokane	990-992-3%	Toronto	7%
Johnstown	159.....-9%	Childress	792.....-14%	Tacoma	983-9842%	Quebec	-1%
Kittanning	162.....-6%	Corpus Christi	783-7846%	Vancouver	986.....3%	Montreal	-1%
Lancaster	175-176-1%	Dallas	751-7536%	Wenatchee	988.....-6%	Quebec City	-1%
Meadville	163.....-9%	Del Rio	788.....-6%	Yakima	989.....-5%	Saskatchewan	4%
Montrose	188.....0%	El Paso	798-799-10%	West Virginia	-5%	La Ronge	3%
		Fort Worth	761-7621%	Beckley	258-259-5%	Prince Albert	2%
		Galveston	775.....12%	Bluefield	247-2480%	Saskatoon	5%
		Giddings	789.....-1%	Charleston	250-2534%		
				Clarksburg	263-264-6%		

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	\$43.04	\$344.32		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$581.52	\$36.35	\$50.88
AD	2 Air tool operators	16.00	\$43.04	\$688.64		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$925.84	\$38.58	\$54.01
BD	3 Bricklayers	24.00	\$37.07	\$889.68		
	2 Bricktenders	16.00	\$27.49	\$439.84		
	TOTAL	40.00		\$1,329.52	\$33.24	\$47.20
BK	1 Bricklayer	8.00	\$37.07	\$296.56		
	1 Bricktender	8.00	\$27.49	\$219.92		
	TOTAL	16.00		\$516.48	\$32.28	\$45.84
BO	2 Bricklayers	16.00	\$37.07	\$593.12		
	2 Bricktenders	16.00	\$27.49	\$439.84		
	TOTAL	32.00		\$1,032.96	\$32.28	\$45.84
2C	2 Carpenters	16.00	\$36.57	\$585.12	\$36.57	\$51.20
CA	1 Carpenter	8.00	\$36.57	\$292.56	\$36.57	\$51.20
CH	1 Carpenter	8.00	\$36.57	\$292.56		
	1/2 Laborer	4.00	\$29.65	\$118.60		
	TOTAL	12.00		\$411.16	\$34.26	\$47.97
CJ	1 Carpenter	8.00	\$36.57	\$292.56		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$529.76	\$33.11	\$46.35
CN	2 Carpenters	16.00	\$36.57	\$585.12		
	1/2 Laborer	4.00	\$29.65	\$118.60		
	TOTAL	20.00		\$703.72	\$35.19	\$49.26
CS	2 Carpenters	16.00	\$36.57	\$585.12		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$822.32	\$34.26	\$47.97
CT	1 Mosaic & terrazzo setter	8.00	\$34.48	\$275.84	\$34.48	\$48.96
CU	4 Carpenters	32.00	\$36.57	\$1,170.24		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	40.00		\$1,407.44	\$35.19	\$49.26
CW	2 Carpenters	16.00	\$36.57	\$585.12		
	2 Laborers	16.00	\$29.65	\$474.40		
	TOTAL	32.00		\$1,059.52	\$33.11	\$46.35
CX	4 Carpenters	32.00	\$36.57	\$1,170.24	\$36.57	\$51.20

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	\$36.57	\$877.68		
	2 Laborers	16.00	\$29.65	\$474.40		
	1 Equipment operator	8.00	\$41.68	\$333.44		
	1 Laborer	8.00	\$29.65	\$237.20		
TOTAL		56.00		\$1,922.72	\$34.33	\$48.07
CZ	4 Carpenters	32.00	\$36.57	\$1,170.24		
	3 Laborers	24.00	\$29.65	\$711.60		
	1 Equipment operator	8.00	\$41.68	\$333.44		
	1 Laborer	8.00	\$29.65	\$237.20		
TOTAL		72.00		\$2,452.48	\$34.06	\$47.69
DD	2 Cement masons	16.00	\$34.68	\$554.88		
	1 Laborer	8.00	\$29.65	\$237.20		
TOTAL		24.00		\$792.08	\$33.00	\$46.86
DF	3 Cement masons	24.00	\$34.68	\$832.32		
	5 Laborers	40.00	\$29.65	\$1,186.00		
TOTAL		64.00		\$2,018.32	\$31.54	\$44.78
DI	1 Drywall installer	8.00	\$35.59	\$284.72	\$35.59	\$49.83
DJ	1 Drywall installer	8.00	\$35.59	\$284.72		
	1 Laborer	8.00	\$29.65	\$237.20		
TOTAL		16.00		\$521.92	\$32.62	\$45.67
DK	1 Drywall installer	8.00	\$35.59	\$284.72		
	1 Drywall taper	8.00	\$35.54	\$284.32		
TOTAL		16.00		\$569.04	\$35.57	\$49.79
DL	2 Drywall installers	16.00	\$35.59	\$569.44		
	1 Drywall taper	8.00	\$35.54	\$284.32		
TOTAL		24.00		\$853.76	\$35.57	\$49.80
DM	2 Drywall installers	16.00	\$35.59	\$569.44	\$35.59	\$49.83
DT	1 Drywall taper	8.00	\$35.54	\$284.32	\$35.54	\$49.76
DU	2 Drywall tapers	16.00	\$35.54	\$568.64	\$35.54	\$49.76
EA	1 Electrician	8.00	\$39.63	\$317.04	\$39.63	\$57.46
EB	2 Electricians	16.00	\$39.63	\$634.08	\$39.63	\$57.46
ED	1 Electrician	8.00	\$39.63	\$317.04		
	1 Carpenter	8.00	\$36.57	\$292.56		
TOTAL		16.00		\$609.60	\$38.10	\$55.25
FA	1 Floorlayer	8.00	\$33.43	\$267.44	\$33.43	\$46.80
FB	2 Floorlayers	16.00	\$33.43	\$534.88		
	1/4 Laborer	2.00	\$29.65	\$59.30		
TOTAL		18.00		\$594.18	\$33.01	\$46.21
FC	1 Floorlayer (hardwood)	8.00	\$35.10	\$280.84	\$35.10	\$49.85

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	\$35.10	\$561.67		
	1/4 Laborer	2.00	\$29.65	\$59.30		
	TOTAL	18.00		\$620.97	\$34.50	\$48.99
GA	1 Glazier	8.00	\$35.30	\$282.40	\$35.30	\$50.13
GB	2 Glaziers	16.00	\$35.30	\$564.80	\$35.30	\$50.13
GC	3 Glaziers	24.00	\$35.30	\$847.20	\$35.30	\$50.13
HA	1 Fence erector	8.00	\$37.87	\$302.95	\$37.87	\$53.77
HB	1 Fence erector	8.00	\$37.87	\$302.95		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$540.15	\$33.76	\$47.94
HD	2 Fence erectors	16.00	\$37.87	\$605.90		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$843.10	\$35.13	\$49.88
1L	1 Laborer	8.00	\$29.65	\$237.20	\$29.65	\$41.51
LB	2 Laborers	16.00	\$29.65	\$474.40	\$29.65	\$41.51
LC	2 Laborers	16.00	\$29.65	\$474.40		
	1 Carpenter	8.00	\$36.57	\$292.56		
	TOTAL	24.00		\$766.96	\$31.96	\$44.74
LD	2 Laborers	16.00	\$29.65	\$474.40		
	2 Carpenters	16.00	\$36.57	\$585.12		
	TOTAL	32.00		\$1,059.52	\$33.11	\$46.35
LG	5 Laborers	40.00	\$29.65	\$1,186.00		
	1 Carpenter	8.00	\$36.57	\$292.56		
	TOTAL	48.00		\$1,478.56	\$30.80	\$43.12
LH	3 Laborers	24.00	\$29.65	\$711.60	\$29.65	\$41.51
LJ	4 Laborers	32.00	\$29.65	\$948.80	\$29.65	\$41.51
LK	2 Laborers	16.00	\$29.65	\$474.40		
	2 Carpenters	16.00	\$36.57	\$585.12		
	1 Equipment operator	8.00	\$41.68	\$333.44		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	48.00		\$1,630.16	\$33.96	\$47.55
LL	3 Laborers	24.00	\$29.65	\$711.60		
	1 Carpenter	8.00	\$36.57	\$292.56		
	1 Equipment operator	8.00	\$41.68	\$333.44		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	48.00		\$1,574.80	\$32.81	\$45.93
LR	1 Lather	8.00	\$35.07	\$280.56	\$35.07	\$49.80
MB	1 Millwright finish carpenter	8.00	\$34.36	\$274.88	\$34.36	\$48.79
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$512.08	\$32.01	\$45.45

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	\$37.07	\$593.12		
	1 Bricktender	8.00	\$27.49	\$219.92		
	TOTAL	24.00		\$813.04	\$33.88	\$48.10
MR	1 Millwright finish carpenter	8.00	\$34.36	\$274.88	\$34.36	\$48.79
NA	1 Painter (brush)	8.00	\$37.30	\$298.40	\$37.30	\$52.22
NC	1 Painter (spray)	8.00	\$38.42	\$307.36	\$38.42	\$53.79
PD	2 Plasterers	16.00	\$36.61	\$585.76		
	1 Plasterer helper	8.00	\$28.71	\$229.68		
	TOTAL	24.00		\$815.44	\$33.98	\$48.25
PE	3 Plasterers	24.00	\$36.61	\$878.64		
	2 Plasterer helpers	16.00	\$28.71	\$459.36		
	TOTAL	40.00		\$1,338.00	\$33.45	\$47.50
QA	1 Paperhanger	8.00	\$39.17	\$313.33	\$39.17	\$56.79
2R	2 Roofers (journeyman)	16.00	\$40.87	\$653.92	\$40.87	\$60.08
RG	2 Roofers (journeyman)	16.00	\$40.87	\$653.92		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$891.12	\$37.13	\$54.58
RJ	2 Roofers (wood shingles)	16.00	\$42.91	\$686.61	\$42.91	\$63.08
RL	2 Roofers (journeyman)	16.00	\$40.87	\$653.92		
	1/2 Laborer	4.00	\$29.65	\$118.60		
	TOTAL	20.00		\$772.52	\$38.63	\$56.78
RM	2 Roofers (wood shingles)	16.00	\$42.91	\$686.61		
	1/2 Laborer	4.00	\$29.65	\$118.60		
	TOTAL	20.00		\$805.21	\$40.26	\$59.18
RQ	2 Roofers (wood shingles)	16.00	\$42.91	\$686.61		
	7/8 Laborer	7.00	\$29.65	\$207.55		
	TOTAL	23.00		\$894.16	\$38.88	\$57.15
RS	1 Roofer (foreman)	8.00	\$44.97	\$359.73		
	3 Roofers (pitch)	24.00	\$42.10	\$1,010.44		
	2 Laborers	16.00	\$29.65	\$474.40		
	TOTAL	48.00		\$1,844.57	\$38.43	\$56.49
RT	2 Roofers (pitch)	16.00	\$42.10	\$673.63		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$910.83	\$37.95	\$55.79
SA	1 Plumber	8.00	\$42.40	\$339.20	\$42.40	\$61.48
SB	1 Plumber	8.00	\$42.40	\$339.20		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$576.40	\$36.03	\$52.24

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	\$42.40	\$339.20		
	1 Electrician	8.00	\$39.63	\$317.04		
	TOTAL	16.00		\$656.24	\$41.02	\$59.47
SD	1 Plumber	8.00	\$42.40	\$339.20		
	1 Laborer	8.00	\$29.65	\$237.20		
	1 Electrician	8.00	\$39.63	\$317.04		
	TOTAL	24.00		\$893.44	\$37.23	\$53.98
SE	2 Plumbers	16.00	\$42.40	\$678.40		
	1 Laborer	8.00	\$29.65	\$237.20		
	1 Electrician	8.00	\$39.63	\$317.04		
	TOTAL	32.00		\$1,232.64	\$38.52	\$55.85
SF	2 Plumbers	16.00	\$42.40	\$678.40		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$915.60	\$38.15	\$55.32
SG	3 Plumbers	24.00	\$42.40	\$1,017.60		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	32.00		\$1,254.80	\$39.21	\$56.86
TB	1 Tile setter (ceramic)	8.00	\$34.79	\$278.32		
	1 Tile setter helper (ceramic)	8.00	\$26.37	\$210.93		
	TOTAL	16.00		\$489.25	\$30.58	\$43.42
UA	1 Sheet metal worker	8.00	\$41.16	\$329.28	\$41.16	\$58.45
UB	2 Sheet metal workers	16.00	\$41.16	\$658.56	\$41.16	\$58.45
UC	2 Sheet metal workers	16.00	\$41.16	\$658.56		
	2 Laborers	16.00	\$29.65	\$474.40		
	TOTAL	32.00		\$1,132.96	\$35.41	\$50.28
UD	1 Sheet metal worker	8.00	\$41.16	\$329.28		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$566.48	\$35.41	\$50.28
UE	1 Sheet metal worker	8.00	\$41.16	\$329.28		
	1 Laborer	8.00	\$29.65	\$237.20		
	1/2 Electrician	4.00	\$39.63	\$158.52		
	TOTAL	20.00		\$725.00	\$36.25	\$51.48
UF	2 Sheet metal workers	16.00	\$41.16	\$658.56		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	24.00		\$895.76	\$37.32	\$53.00
VB	1 Equipment operator	8.00	\$41.68	\$333.44		
	1 Laborer	8.00	\$29.65	\$237.20		
	TOTAL	16.00		\$570.64	\$35.67	\$49.93

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

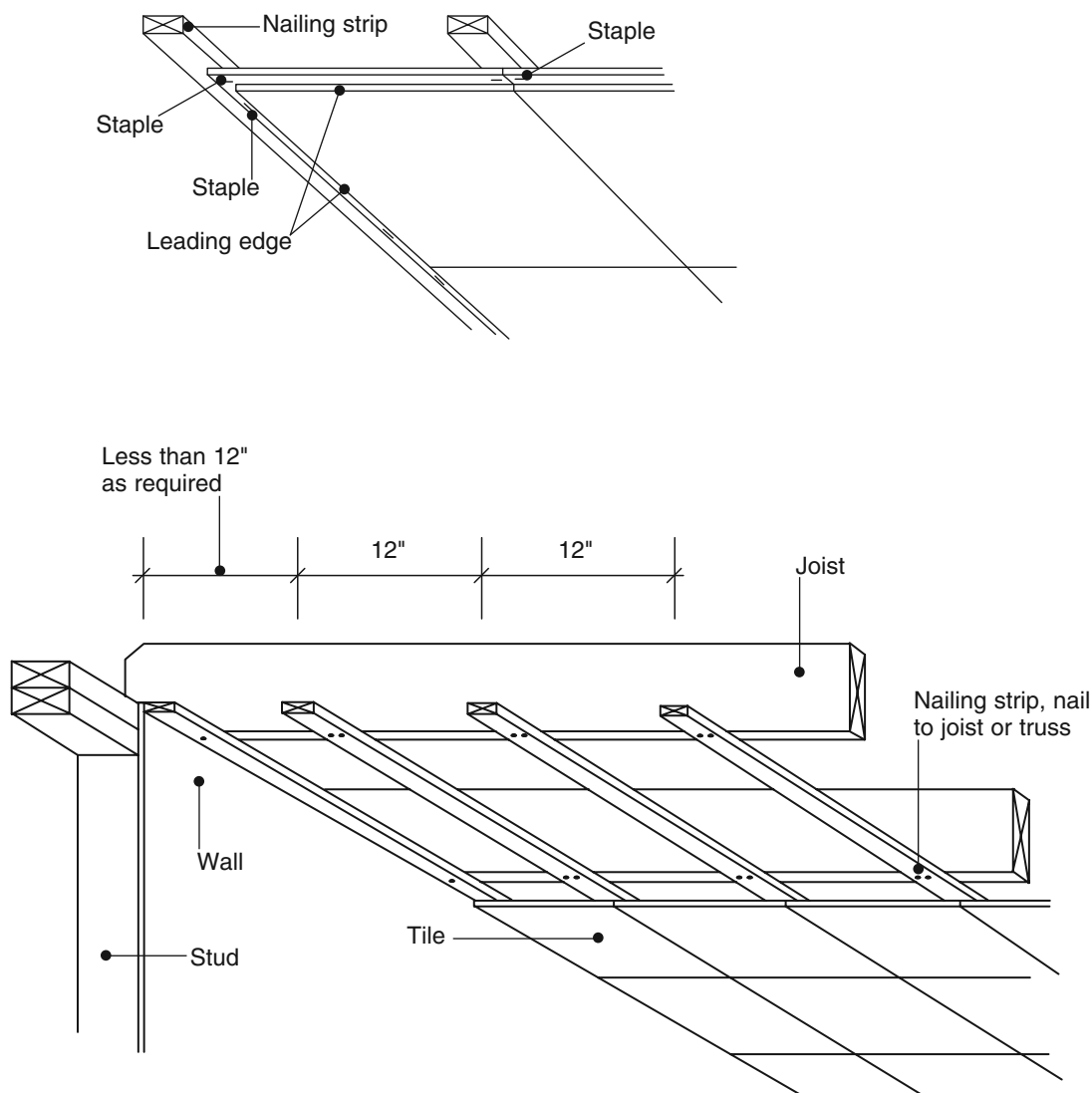
- Acoustical tile. $\frac{1}{2}$ " thick x 12" x 12", 24".
- Insulating tile, decorative. $\frac{1}{2}$ " thick x 12" x 12", 24"; $\frac{1}{2}$ " thick x 16" x 16", 32".

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 439

Ceiling and wall tile

Adhesive set

Tile only, no grid system

Demo	SF	Lg	LB	.012	1300	---	.36	---	.36	.50
Demo	SF	Sm	LB	.018	910.0	---	.53	---	.53	.75

Tile on furring strips

Demo	SF	Lg	LB	.009	1710	---	.27	---	.27	.37
Demo	SF	Sm	LB	.013	1197	---	.39	---	.39	.54

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	.88	.66	---	1.54	1.93
	Inst	SF	Sm	2C	.026	616.0	.97	.95	---	1.92	2.45
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.47	.66	---	2.13	2.61
	Inst	SF	Sm	2C	.026	616.0	1.62	.95	---	2.57	3.19
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.04	.66	---	2.70	3.27
	Inst	SF	Sm	2C	.026	616.0	2.25	.95	---	3.20	3.92
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	2.76	.66	---	3.42	4.10
	Inst	SF	Sm	2C	.026	616.0	3.05	.95	---	4.00	4.84

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

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	1.07	.66	---	1.73	2.15
	Inst	SF	Sm	2C	.026	616.0	1.18	.95	---	2.13	2.69
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	1.80	.66	---	2.46	2.99
	Inst	SF	Sm	2C	.026	616.0	1.99	.95	---	2.94	3.62
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.51	.66	---	3.17	3.81
	Inst	SF	Sm	2C	.026	616.0	2.76	.95	---	3.71	4.51
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	3.42	.66	---	4.08	4.85
	Inst	SF	Sm	2C	.026	616.0	3.77	.95	---	4.72	5.67

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

Economy, mini perforated	Inst	SF	Lg	2C	.018	880.0	1.18	.66	---	1.84	2.28
	Inst	SF	Sm	2C	.026	616.0	1.30	.95	---	2.25	2.83
Standard, random perforated	Inst	SF	Lg	2C	.018	880.0	2.00	.66	---	2.66	3.22
	Inst	SF	Sm	2C	.026	616.0	2.20	.95	---	3.15	3.86
Designer, swirl perforation	Inst	SF	Lg	2C	.018	880.0	2.79	.66	---	3.45	4.13
	Inst	SF	Sm	2C	.026	616.0	3.08	.95	---	4.03	4.87
Deluxe, sculptured face	Inst	SF	Lg	2C	.018	880.0	3.81	.66	---	4.47	5.30
	Inst	SF	Sm	2C	.026	616.0	4.20	.95	---	5.15	6.16

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	.58
	Demo	SF	Sm	LB	.020	819	---	.59	---	.59	.83
Tile on furring strips	Demo	SF	Lg	LB	.010	1540	---	.30	---	.30	.42
	Demo	SF	Sm	LB	.015	1078	---	.44	---	.44	.62

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	.80	.62	---	1.42	1.79
	Inst	SF	Sm	2C	.024	672.0	.89	.88	---	1.77	2.25
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.39	.62	---	2.01	2.47
	Inst	SF	Sm	2C	.024	672.0	1.53	.88	---	2.41	2.99
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	1.96	.62	---	2.58	3.12
	Inst	SF	Sm	2C	.024	672.0	2.16	.88	---	3.04	3.71
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	2.69	.62	---	3.31	3.96
	Inst	SF	Sm	2C	.024	672.0	2.96	.88	---	3.84	4.63

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

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	.99	.62	---	1.61	2.01
	Inst	SF	Sm	2C	.024	672.0	1.09	.88	---	1.97	2.48
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.72	.62	---	2.34	2.85
	Inst	SF	Sm	2C	.024	672.0	1.90	.88	---	2.78	3.41
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.43	.62	---	3.05	3.66
	Inst	SF	Sm	2C	.024	672.0	2.68	.88	---	3.56	4.31
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	3.34	.62	---	3.96	4.71
	Inst	SF	Sm	2C	.024	672.0	3.68	.88	---	4.56	5.46

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

Economy, mini perforated	Inst	SF	Lg	2C	.017	960.0	1.10	.62	---	1.72	2.14
	Inst	SF	Sm	2C	.024	672.0	1.21	.88	---	2.09	2.62
Standard, random perforated	Inst	SF	Lg	2C	.017	960.0	1.92	.62	---	2.54	3.08
	Inst	SF	Sm	2C	.024	672.0	2.12	.88	---	3.00	3.67
Designer, swirl perforation	Inst	SF	Lg	2C	.017	960.0	2.71	.62	---	3.33	3.99
	Inst	SF	Sm	2C	.024	672.0	2.99	.88	---	3.87	4.67
Deluxe, sculptured face	Inst	SF	Lg	2C	.017	960.0	3.73	.62	---	4.35	5.16
	Inst	SF	Sm	2C	.024	672.0	4.11	.88	---	4.99	5.96

Applied by staples, nails or clips to furring strips ADD

	Inst	SF	Lg	2C	.017	960.0	---	.62	---	.62	.87
	Inst	SF	Sm	2C	.024	672.0	---	.88	---	.88	1.23

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	.82
	Inst	SF	Sm	2C	.014	1120	.30	.51	---	.81	1.06
1" x 4", 16" oc	Inst	SF	Lg	2C	.008	1920	.24	.29	---	.53	.69
	Inst	SF	Sm	2C	.012	1344	.26	.44	---	.70	.91

Over plaster

1" x 4", 12" oc	Inst	SF	Lg	2C	.013	1280	.27	.48	---	.75	.98
	Inst	SF	Sm	2C	.018	896	.30	.66	---	.96	1.27
1" x 4", 16" oc	Inst	SF	Lg	2C	.010	1600	.24	.37	---	.61	.79
	Inst	SF	Sm	2C	.014	1120	.26	.51	---	.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	3.69	2.74	---	6.43	7.97
	Inst	CSF	Sm	CA	.101	79.50	4.07	3.69	---	7.76	9.73
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	14.70	2.74	---	17.44	20.40
	Inst	CSF	Sm	CA	.101	79.50	16.20	3.69	---	19.89	23.40
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	33.20	2.74	---	35.94	41.10
	Inst	CSF	Sm	CA	.101	79.50	36.60	3.69	---	40.29	46.20
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.075	106.0	58.80	2.74	---	61.54	69.70
	Inst	CSF	Sm	CA	.101	79.50	64.80	3.69	---	68.49	77.80

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	2.96	2.05	---	5.01	6.18
	Inst	CSF	Sm	CA	.075	107.3	3.26	2.74	---	6.00	7.49
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	11.80	2.05	---	13.85	16.10
	Inst	CSF	Sm	CA	.075	107.3	13.00	2.74	---	15.74	18.40
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	26.60	2.05	---	28.65	32.70
	Inst	CSF	Sm	CA	.075	107.3	29.30	2.74	---	32.04	36.70
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.056	143.0	47.10	2.05	---	49.15	55.60
	Inst	CSF	Sm	CA	.075	107.3	51.90	2.74	---	54.64	61.90

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	2.21	1.90	---	4.11	5.14
	Inst	CSF	Sm	CA	.069	115.5	2.44	2.52	---	4.96	6.27
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	8.84	1.90	---	10.74	12.60
	Inst	CSF	Sm	CA	.069	115.5	9.74	2.52	---	12.26	14.40
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	19.90	1.90	---	21.80	25.00
	Inst	CSF	Sm	CA	.069	115.5	22.00	2.52	---	24.52	28.20
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.052	154.0	35.30	1.90	---	37.20	42.20
	Inst	CSF	Sm	CA	.069	115.5	38.90	2.52	---	41.42	47.10

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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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	2.65	3.66	---	6.31	8.09
	Inst	CSF	Sm	CA	.133	60.00	2.92	4.86	---	7.78	10.10
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	10.50	3.66	---	14.16	16.90
	Inst	CSF	Sm	CA	.133	60.00	11.60	4.86	---	16.46	19.80
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	23.80	3.66	---	27.46	31.70
	Inst	CSF	Sm	CA	.133	60.00	26.20	4.86	---	31.06	36.10
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	42.00	3.66	---	45.66	52.20
	Inst	CSF	Sm	CA	.133	60.00	46.30	4.86	---	51.16	58.70

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	2.12	3.33	---	5.45	7.03
	Inst	CSF	Sm	CA	.121	66.00	2.33	4.42	---	6.75	8.80
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	8.42	3.33	---	11.75	14.10
	Inst	CSF	Sm	CA	.121	66.00	9.28	4.42	---	13.70	16.60
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	19.00	3.33	---	22.33	25.90
	Inst	CSF	Sm	CA	.121	66.00	20.90	4.42	---	25.32	29.60
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	33.60	3.33	---	36.93	42.30
	Inst	CSF	Sm	CA	.121	66.00	37.00	4.42	---	41.42	47.70

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.59	3.07	---	4.66	6.08
	Inst	CSF	Sm	CA	.112	71.25	1.75	4.10	---	5.85	7.69
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	6.31	3.07	---	9.38	11.40
	Inst	CSF	Sm	CA	.112	71.25	6.96	4.10	---	11.06	13.50
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	14.30	3.07	---	17.37	20.30
	Inst	CSF	Sm	CA	.112	71.25	15.70	4.10	---	19.80	23.30
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	25.20	3.07	---	28.27	32.50
	Inst	CSF	Sm	CA	.112	71.25	27.80	4.10	---	31.90	36.90

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	3.80	3.66	---	7.46	9.38
	Inst	CSF	Sm	CA	.133	60.00	4.19	4.86	---	9.05	11.50
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	15.20	3.66	---	18.86	22.10
	Inst	CSF	Sm	CA	.133	60.00	16.70	4.86	---	21.56	25.50
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	34.20	3.66	---	37.86	43.40
	Inst	CSF	Sm	CA	.133	60.00	37.70	4.86	---	42.56	49.00
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	60.50	3.66	---	64.16	72.90
	Inst	CSF	Sm	CA	.133	60.00	66.70	4.86	---	71.56	81.50

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.04	3.33	---	6.37	8.06
	Inst	CSF	Sm	CA	.121	66.00	3.35	4.42	---	7.77	9.95
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.10	3.33	---	15.43	18.20
	Inst	CSF	Sm	CA	.121	66.00	13.40	4.42	---	17.82	21.20
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	27.40	3.33	---	30.73	35.30
	Inst	CSF	Sm	CA	.121	66.00	30.10	4.42	---	34.52	40.00
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	48.40	3.33	---	51.73	58.90
	Inst	CSF	Sm	CA	.121	66.00	53.30	4.42	---	57.72	65.90

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
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.28	3.07	---	5.35	6.85
	Inst	CSF	Sm	CA	.129	62.00	2.52	4.72	---	7.24	9.43
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.09	3.07	---	12.16	14.50
	Inst	CSF	Sm	CA	.129	62.00	10.00	4.72	---	14.72	17.80
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	20.50	3.07	---	23.57	27.30
	Inst	CSF	Sm	CA	.129	62.00	22.60	4.72	---	27.32	31.90
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	36.30	3.07	---	39.37	45.00
	Inst	CSF	Sm	CA	.129	62.00	40.00	4.72	---	44.72	51.40

Gypsum drywall adhesive, on ceilings**12" oc members**

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	2.32	3.66	---	5.98	7.72
	Inst	CSF	Sm	CA	.133	60.00	2.56	4.86	---	7.42	9.68
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	9.26	3.66	---	12.92	15.50
	Inst	CSF	Sm	CA	.133	60.00	10.20	4.86	---	15.06	18.20
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	20.90	3.66	---	24.56	28.50
	Inst	CSF	Sm	CA	.133	60.00	23.00	4.86	---	27.86	32.60
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	37.00	3.66	---	40.66	46.50
	Inst	CSF	Sm	CA	.133	60.00	40.70	4.86	---	45.56	52.40

16" oc members

1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	1.86	3.33	---	5.19	6.74
	Inst	CSF	Sm	CA	.121	66.00	2.05	4.42	---	6.47	8.49
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	7.41	3.33	---	10.74	13.00
	Inst	CSF	Sm	CA	.121	66.00	8.16	4.42	---	12.58	15.30
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	16.70	3.33	---	20.03	23.40
	Inst	CSF	Sm	CA	.121	66.00	18.40	4.42	---	22.82	26.80
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	29.60	3.33	---	32.93	37.80
	Inst	CSF	Sm	CA	.121	66.00	32.60	4.42	---	37.02	42.70

24" oc members

1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.39	3.07	---	4.46	5.86
	Inst	CSF	Sm	CA	.112	71.25	1.53	4.10	---	5.63	7.45
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	5.56	3.07	---	8.63	10.50
	Inst	CSF	Sm	CA	.112	71.25	6.12	4.10	---	10.22	12.60
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	12.50	3.07	---	15.57	18.30
	Inst	CSF	Sm	CA	.112	71.25	13.80	4.10	---	17.90	21.20
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	22.20	3.07	---	25.27	29.10
	Inst	CSF	Sm	CA	.112	71.25	24.40	4.10	---	28.50	33.10

Gypsum drywall adhesive, on walls**12" oc members**

1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	2.32	3.66	---	5.98	7.72
	Inst	CSF	Sm	CA	.133	60.00	2.56	4.86	---	7.42	9.68
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	9.26	3.66	---	12.92	15.50
	Inst	CSF	Sm	CA	.133	60.00	10.20	4.86	---	15.06	18.20
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	20.90	3.66	---	24.56	28.50
	Inst	CSF	Sm	CA	.133	60.00	23.00	4.86	---	27.86	32.60
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	37.00	3.66	---	40.66	46.50
	Inst	CSF	Sm	CA	.133	60.00	40.70	4.86	---	45.56	52.40

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
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	1.86	3.33	---	5.19	6.74
	Inst	CSF	Sm	CA	.121	66.00	2.05	4.42	---	6.47	8.49
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	7.41	3.33	---	10.74	13.00
	Inst	CSF	Sm	CA	.121	66.00	8.16	4.42	---	12.58	15.30
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	16.70	3.33	---	20.03	23.40
	Inst	CSF	Sm	CA	.121	66.00	18.40	4.42	---	22.82	26.80
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	29.60	3.33	---	32.93	37.80
	Inst	CSF	Sm	CA	.121	66.00	32.60	4.42	---	37.02	42.70
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	1.39	3.07	---	4.46	5.86
	Inst	CSF	Sm	CA	.112	71.25	1.53	4.10	---	5.63	7.45
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	5.56	3.07	---	8.63	10.50
	Inst	CSF	Sm	CA	.112	71.25	6.12	4.10	---	10.22	12.60
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	12.50	3.07	---	15.57	18.30
	Inst	CSF	Sm	CA	.112	71.25	13.80	4.10	---	17.90	21.20
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	22.20	3.07	---	25.27	29.10
	Inst	CSF	Sm	CA	.112	71.25	24.40	4.10	---	28.50	33.10
Hardboard or plastic panel adhesive, on walls											
12" oc members											
1/8" diameter (11 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	3.80	3.66	---	7.46	9.38
	Inst	CSF	Sm	CA	.133	60.00	4.19	4.86	---	9.05	11.50
1/4" diameter (43 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	15.20	3.66	---	18.86	22.10
	Inst	CSF	Sm	CA	.133	60.00	16.70	4.86	---	21.56	25.50
3/8" diameter (97 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	34.20	3.66	---	37.86	43.40
	Inst	CSF	Sm	CA	.133	60.00	37.70	4.86	---	42.56	49.00
1/2" diameter (172 fl.oz./CSF)	Inst	CSF	Lg	CA	.100	80.00	60.50	3.66	---	64.16	72.90
	Inst	CSF	Sm	CA	.133	60.00	66.70	4.86	---	71.56	81.50
16" oc members											
1/8" diameter (9 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	3.04	3.33	---	6.37	8.06
	Inst	CSF	Sm	CA	.121	66.00	3.35	4.42	---	7.77	9.95
1/4" diameter (34 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	12.10	3.33	---	15.43	18.20
	Inst	CSF	Sm	CA	.121	66.00	13.40	4.42	---	17.82	21.20
3/8" diameter (78 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	27.40	3.33	---	30.73	35.30
	Inst	CSF	Sm	CA	.121	66.00	30.10	4.42	---	34.52	40.00
1/2" diameter (137 fl.oz./CSF)	Inst	CSF	Lg	CA	.091	88.00	48.40	3.33	---	51.73	58.90
	Inst	CSF	Sm	CA	.121	66.00	53.30	4.42	---	57.72	65.90
24" oc members											
1/8" diameter (7 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	2.28	3.07	---	5.35	6.85
	Inst	CSF	Sm	CA	.112	71.25	2.52	4.10	---	6.62	8.56
1/4" diameter (26 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	9.09	3.07	---	12.16	14.50
	Inst	CSF	Sm	CA	.112	71.25	10.00	4.10	---	14.10	17.00
3/8" diameter (58 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	20.50	3.07	---	23.57	27.30
	Inst	CSF	Sm	CA	.112	71.25	22.60	4.10	---	26.70	31.10
1/2" diameter (103 fl.oz./CSF)	Inst	CSF	Lg	CA	.084	95.00	36.30	3.07	---	39.37	45.00
	Inst	CSF	Sm	CA	.112	71.25	40.00	4.10	---	44.10	50.50

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	640.00	288.00	---	928.00	1150.00
	Inst	Ea	Sm	SB	10.0	1.60	704.00	360.00	---	1064.00	1230.00
1.5 ton	Inst	Ea	Lg	SB	9.14	1.75	785.00	329.00	---	1114.00	1380.00
	Inst	Ea	Sm	SB	11.4	1.40	864.00	411.00	---	1275.00	1460.00
2.0 ton	Inst	Ea	Lg	SB	10.7	1.50	900.00	386.00	---	1286.00	1590.00
	Inst	Ea	Sm	SB	13.3	1.20	990.00	479.00	---	1469.00	1680.00
2.5 ton	Inst	Ea	Lg	SB	12.8	1.25	1080.00	461.00	---	1541.00	1900.00
	Inst	Ea	Sm	SB	16.0	1.00	1180.00	576.00	---	1756.00	2020.00
3.0 ton	Inst	Ea	Lg	SB	16.0	1.00	1280.00	576.00	---	1856.00	2300.00
	Inst	Ea	Sm	SB	20.0	0.80	1400.00	721.00	---	2121.00	2450.00
4.0 ton	Inst	Ea	Lg	SB	21.3	0.75	1680.00	767.00	---	2447.00	3040.00
	Inst	Ea	Sm	SB	26.7	0.60	1840.00	962.00	---	2802.00	3240.00
5.0 ton	Inst	Ea	Lg	SB	32.0	0.50	2050.00	1150.00	---	3200.00	4030.00
	Inst	Ea	Sm	SB	40.0	0.40	2260.00	1440.00	---	3700.00	4340.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.33	3.00	---	192.00	---	192.00	278.00
	Inst	Job	Sm	SB	6.67	2.40	---	240.00	---	240.00	348.00

Diffusers

Aluminum, opposed blade damper, unless otherwise noted

Ceiling or sidewall, linear

2" wide	Inst	LF	Lg	UA	.267	30.00	23.50	11.00	---	34.50	42.60
	Inst	LF	Sm	UA	.333	24.00	25.90	13.70	---	39.60	45.30
4" wide	Inst	LF	Lg	UA	.296	27.00	31.50	12.20	---	43.70	53.50
	Inst	LF	Sm	UA	.370	21.60	34.70	15.20	---	49.90	56.30
6" wide	Inst	LF	Lg	UA	.333	24.00	39.00	13.70	---	52.70	64.30
	Inst	LF	Sm	UA	.417	19.20	42.90	17.20	---	60.10	67.30
8" wide	Inst	LF	Lg	UA	.400	20.00	45.50	16.50	---	62.00	75.70
	Inst	LF	Sm	UA	.500	16.00	50.10	20.60	---	70.70	79.30

Perforated, 24" x 24" panel size

6" x 6"	Inst	Ea	Lg	UA	.500	16.00	64.00	20.60	---	84.60	103.00
	Inst	Ea	Sm	UA	.625	12.80	70.40	25.70	---	96.10	107.00
8" x 8"	Inst	Ea	Lg	UA	.571	14.00	66.00	23.50	---	89.50	109.00
	Inst	Ea	Sm	UA	.714	11.20	72.60	29.40	---	102.00	114.00
10" x 10"	Inst	Ea	Lg	UA	.667	12.00	67.00	27.50	---	94.50	116.00
	Inst	Ea	Sm	UA	.833	9.60	73.70	34.30	---	108.00	122.00
12" x 12"	Inst	Ea	Lg	UA	.800	10.00	69.50	32.90	---	102.40	127.00
	Inst	Ea	Sm	UA	1.00	8.00	76.50	41.20	---	117.70	135.00
18" x 18"	Inst	Ea	Lg	UA	1.00	8.00	92.50	41.20	---	133.70	165.00
	Inst	Ea	Sm	UA	1.25	6.40	102.00	51.50	---	153.50	175.00

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	37.50	20.60	---	58.10	72.40
	Inst	Ea	Sm	UA	.625	12.80	41.30	25.70	---	67.00	77.80
12" x 6"	Inst	Ea	Lg	UA	.571	14.00	48.00	23.50	---	71.50	88.60
	Inst	Ea	Sm	UA	.714	11.20	52.80	29.40	---	82.20	94.50
12" x 9"	Inst	Ea	Lg	UA	.667	12.00	56.50	27.50	---	84.00	104.00
	Inst	Ea	Sm	UA	.833	9.60	62.20	34.30	---	96.50	111.00
12" x 12"	Inst	Ea	Lg	UA	.800	10.00	66.00	32.90	---	98.90	123.00
	Inst	Ea	Sm	UA	1.00	8.00	72.60	41.20	---	113.80	131.00
24" x 12"	Inst	Ea	Lg	UA	1.00	8.00	112.00	41.20	---	153.20	187.00
	Inst	Ea	Sm	UA	1.25	6.40	123.00	51.50	---	174.50	196.00
T-bar mounting, 24" x 24" lay in frame											
6" x 6"	Inst	Ea	Lg	UA	.500	16.00	60.50	20.60	---	81.10	98.80
	Inst	Ea	Sm	UA	.625	12.80	66.60	25.70	---	92.30	103.00
9" x 9"	Inst	Ea	Lg	UA	.571	14.00	67.50	23.50	---	91.00	111.00
	Inst	Ea	Sm	UA	.714	11.20	74.30	29.40	---	103.70	116.00
12" x 12"	Inst	Ea	Lg	UA	.667	12.00	88.50	27.50	---	116.00	141.00
	Inst	Ea	Sm	UA	.833	9.60	97.40	34.30	---	131.70	146.00
15" x 15"	Inst	Ea	Lg	UA	.800	10.00	92.00	32.90	---	124.90	153.00
	Inst	Ea	Sm	UA	1.00	8.00	101.00	41.20	---	142.20	160.00
18" x 18"	Inst	Ea	Lg	UA	1.00	8.00	121.00	41.20	---	162.20	198.00
	Inst	Ea	Sm	UA	1.25	6.40	133.00	51.50	---	184.50	206.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	UA	2.29	3.50	---	94.30	---	94.30	134.00
	Inst	Job	Sm	UA	2.86	2.80	---	118.00	---	118.00	167.00

Ductwork**Fabricated rectangular, includes fittings, joints, supports***Aluminum alloy*

Under 100 lbs	Inst	Lb	Lg	UF	.343	70.00	3.50	12.80	---	16.30	22.20
	Inst	Lb	Sm	UF	.429	56.00	3.85	16.00	---	19.85	26.60
100 to 500 lbs	Inst	Lb	Lg	UF	.267	90.00	2.53	9.96	---	12.49	17.10
	Inst	Lb	Sm	UF	.333	72.00	2.78	12.40	---	15.18	20.40
500 to 1,000 lbs	Inst	Lb	Lg	UF	.218	110.0	1.82	8.14	---	9.96	13.70
	Inst	Lb	Sm	UF	.273	88.00	2.00	10.20	---	12.20	16.50
Over 1,000 lbs	Inst	Lb	Lg	UF	.185	130.0	1.35	6.90	---	8.25	11.40
	Inst	Lb	Sm	UF	.231	104.0	1.49	8.62	---	10.11	13.70

Galvanized steel

Under 400 lbs	Inst	Lb	Lg	UF	.120	200.0	1.05	4.48	---	5.53	7.57
	Inst	Lb	Sm	UF	.150	160.0	1.16	5.60	---	6.76	9.11
400 to 1,000 lbs	Inst	Lb	Lg	UF	.112	215.0	.67	4.18	---	4.85	6.71
	Inst	Lb	Sm	UF	.140	172.0	.74	5.22	---	5.96	8.16
1,000 to 2,000 lbs	Inst	Lb	Lg	UF	.104	230.0	.50	3.88	---	4.38	6.09
	Inst	Lb	Sm	UF	.130	184.0	.55	4.85	---	5.40	7.44
2,000 to 5,000 lbs	Inst	Lb	Lg	UF	.100	240.0	.40	3.73	---	4.13	5.76
	Inst	Lb	Sm	UF	.125	192.0	.44	4.67	---	5.11	7.07
Over 10,000 lbs	Inst	Lb	Lg	UF	.096	250.0	.35	3.58	---	3.93	5.49
	Inst	Lb	Sm	UF	.120	200.0	.39	4.48	---	4.87	6.75

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	.78	2.05	---	2.83	3.81
	Inst	LF	Sm	UD	.073	220.0	.86	2.58	---	3.44	4.53
5" diameter	Inst	LF	Lg	UD	.071	225.0	.91	2.51	---	3.42	4.62
	Inst	LF	Sm	UD	.089	180.0	1.00	3.15	---	4.15	5.47
6" diameter	Inst	LF	Lg	UD	.080	200.0	1.02	2.83	---	3.85	5.20
	Inst	LF	Sm	UD	.100	160.0	1.12	3.54	---	4.66	6.15
7" diameter	Inst	LF	Lg	UD	.091	175.0	1.34	3.22	---	4.56	6.12
	Inst	LF	Sm	UD	.114	140.0	1.47	4.04	---	5.51	7.20
8" diameter	Inst	LF	Lg	UD	.107	150.0	1.39	3.79	---	5.18	6.98
	Inst	LF	Sm	UD	.133	120.0	1.53	4.71	---	6.24	8.22
10" diameter	Inst	LF	Lg	UD	.128	125.0	1.78	4.53	---	6.31	8.48
	Inst	LF	Sm	UD	.160	100.0	1.96	5.67	---	7.63	10.00
12" diameter	Inst	LF	Lg	UD	.160	100.0	2.11	5.67	---	7.78	10.50
	Inst	LF	Sm	UD	.200	80.0	2.32	7.08	---	9.40	12.40

Insulated

3" diameter	Inst	LF	Lg	UD	.064	250.0	1.34	2.27	---	3.61	4.76
	Inst	LF	Sm	UD	.080	200.0	1.47	2.83	---	4.30	5.49
4" diameter	Inst	LF	Lg	UD	.071	225.0	1.34	2.51	---	3.85	5.11
	Inst	LF	Sm	UD	.089	180.0	1.47	3.15	---	4.62	5.94
5" diameter	Inst	LF	Lg	UD	.080	200.0	1.57	2.83	---	4.40	5.83
	Inst	LF	Sm	UD	.100	160.0	1.73	3.54	---	5.27	6.76
6" diameter	Inst	LF	Lg	UD	.091	175.0	1.73	3.22	---	4.95	6.56
	Inst	LF	Sm	UD	.114	140.0	1.90	4.04	---	5.94	7.63
7" diameter	Inst	LF	Lg	UD	.107	150.0	2.11	3.79	---	5.90	7.81
	Inst	LF	Sm	UD	.133	120.0	2.32	4.71	---	7.03	9.01
8" diameter	Inst	LF	Lg	UD	.128	125.0	2.16	4.53	---	6.69	8.92
	Inst	LF	Sm	UD	.160	100.0	2.38	5.67	---	8.05	10.40
10" diameter	Inst	LF	Lg	UD	.160	100.0	2.81	5.67	---	8.48	11.30
	Inst	LF	Sm	UD	.200	80.00	3.09	7.08	---	10.17	13.20
12" diameter	Inst	LF	Lg	UD	.213	75.00	3.27	7.54	---	10.81	14.50
	Inst	LF	Sm	UD	.267	60.00	3.60	9.45	---	13.05	17.00
14" diameter	Inst	LF	Lg	UD	.320	50.00	3.96	11.30	---	15.26	20.60
	Inst	LF	Sm	UD	.400	40.00	4.36	14.20	---	18.56	24.50

Duct accessories

Air extractors

12" x 4"	Inst	Ea	Lg	UA	.333	24.00	12.30	13.70	---	26.00	33.60
	Inst	Ea	Sm	UA	.417	19.20	13.50	17.20	---	30.70	37.90
8" x 6"	Inst	Ea	Lg	UA	.400	20.00	12.30	16.50	---	28.80	37.50
	Inst	Ea	Sm	UA	.500	16.00	13.50	20.60	---	34.10	42.70
20" x 8"	Inst	Ea	Lg	UA	.500	16.00	27.50	20.60	---	48.10	60.90
	Inst	Ea	Sm	UA	.625	12.80	30.30	25.70	---	56.00	66.80
18" x 10"	Inst	Ea	Lg	UA	.571	14.00	27.00	23.50	---	50.50	64.40
	Inst	Ea	Sm	UA	.714	11.20	29.70	29.40	---	59.10	71.40
24" x 12"	Inst	Ea	Lg	UA	.800	10.00	37.50	32.90	---	70.40	89.90
	Inst	Ea	Sm	UA	1.00	8.00	41.30	41.20	---	82.50	99.70

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	16.70	13.70	---	30.40	38.60
	Inst	Ea	Sm	UA	.417	19.20	18.30	17.20	---	35.50	42.70
12" x 4"	Inst	Ea	Lg	UA	.364	22.00	16.70	15.00	---	31.70	40.40
	Inst	Ea	Sm	UA	.455	17.60	18.30	18.70	---	37.00	44.90
16" x 14"	Inst	Ea	Lg	UA	.667	12.00	26.50	27.50	---	54.00	69.50
	Inst	Ea	Sm	UA	.833	9.60	29.20	34.30	---	63.50	77.80
24" x 20"	Inst	Ea	Lg	UA	1.00	8.00	33.50	41.20	---	74.70	97.00
	Inst	Ea	Sm	UA	1.25	6.40	36.90	51.50	---	88.40	110.00
Dampers, multi-blade, opposed blade											
12" x 12"	Inst	Ea	Lg	UA	.500	16.00	24.50	20.60	---	45.10	57.40
	Inst	Ea	Sm	UA	.625	12.80	27.00	25.70	---	52.70	63.50
12" x 18"	Inst	Ea	Lg	UA	.667	12.00	32.50	27.50	---	60.00	76.40
	Inst	Ea	Sm	UA	.833	9.60	35.80	34.30	---	70.10	84.40
24" x 24"	Inst	Ea	Lg	UA	1.00	8.00	69.00	41.20	---	110.20	138.00
	Inst	Ea	Sm	UA	1.25	6.40	75.90	51.50	---	127.40	149.00
48" x 36"	Inst	Ea	Lg	UD	2.67	6.00	209.00	94.50	---	303.50	375.00
	Inst	Ea	Sm	UD	3.33	4.80	230.00	118.00	---	348.00	397.00
Dampers, variable volume modulating, motorized											
12" x 12"	Inst	Ea	Lg	UA	0.80	10.00	126.00	32.90	---	158.90	192.00
	Inst	Ea	Sm	UA	1.00	8.00	139.00	41.20	---	180.20	197.00
24" x 12"	Inst	Ea	Lg	UA	1.33	6.00	151.00	54.70	---	205.70	251.00
	Inst	Ea	Sm	UA	1.67	4.80	166.00	68.70	---	234.70	264.00
30" x 18"	Inst	Ea	Lg	UA	2.00	4.00	280.00	82.30	---	362.30	439.00
	Inst	Ea	Sm	UA	2.50	3.20	308.00	103.00	---	411.00	454.00
Thermostat, ADD	Inst	Ea	Lg	UA	1.33	6.00	30.00	54.70	---	84.70	112.00
	Inst	Ea	Sm	UA	1.67	4.80	33.00	68.70	---	101.70	131.00
Dampers, multi-blade, parallel blade											
8" x 8"	Inst	Ea	Lg	UA	.400	20.00	51.00	16.50	---	67.50	82.00
	Inst	Ea	Sm	UA	.500	16.00	56.10	20.60	---	76.70	85.30
16" x 10"	Inst	Ea	Lg	UA	.500	16.00	53.50	20.60	---	74.10	90.80
	Inst	Ea	Sm	UA	.625	12.80	58.90	25.70	---	84.60	95.40
18" x 12"	Inst	Ea	Lg	UA	.667	12.00	55.00	27.50	---	82.50	102.00
	Inst	Ea	Sm	UA	.833	9.60	60.50	34.30	---	94.80	109.00
28" x 16"	Inst	Ea	Lg	UA	1.00	8.00	74.50	41.20	---	115.70	144.00
	Inst	Ea	Sm	UA	1.25	6.40	82.00	51.50	---	133.50	155.00
Mixing box, with electric or pneumatic motor, with silencer											
150 to 250 CFM	Inst	Ea	Lg	UD	1.60	10.00	455.00	56.70	---	511.70	604.00
	Inst	Ea	Sm	UD	2.00	8.00	501.00	70.80	---	571.80	601.00
270 to 600 CFM	Inst	Ea	Lg	UD	2.00	8.00	470.00	70.80	---	540.80	641.00
	Inst	Ea	Sm	UD	2.50	6.40	517.00	88.50	---	605.50	643.00

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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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	3330.00	242.00	---	3572.00	4170.00
	Inst	Ea	Sm	UE	8.33	2.40	3660.00	302.00	---	3962.00	4090.00
15,600 CFM, 10 HP	Inst	Ea	Lg	UE	13.3	1.50	5800.00	482.00	---	6282.00	7350.00
	Inst	Ea	Sm	UE	16.7	1.20	6380.00	605.00	---	6985.00	7240.00

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	700.00	242.00	---	942.00	1150.00
	Inst	Ea	Sm	UE	8.33	2.40	770.00	302.00	---	1072.00	1200.00
1,520 CFM, 16" dia. connect	Inst	Ea	Lg	UE	10.0	2.00	915.00	363.00	---	1278.00	1570.00
	Inst	Ea	Sm	UE	12.5	1.60	1010.00	453.00	---	1463.00	1650.00
3,480 CFM, 20" dia. connect	Inst	Ea	Lg	UE	20.0	1.00	1200.00	725.00	---	1925.00	2410.00
	Inst	Ea	Sm	UE	25.0	0.80	1320.00	906.00	---	2226.00	2610.00

Ceiling fan, right angle, extra quiet 0.10" self-propelled

200 CFM	Inst	Ea	Lg	UE	1.25	16.00	149.00	45.30	---	194.30	236.00
	Inst	Ea	Sm	UE	1.56	12.80	164.00	56.60	---	220.60	244.00
900 CFM	Inst	Ea	Lg	UE	1.67	12.00	355.00	60.50	---	415.50	494.00
	Inst	Ea	Sm	UE	2.08	9.60	391.00	75.40	---	466.40	498.00
3,000 CFM	Inst	Ea	Lg	UE	2.50	8.00	675.00	90.60	---	765.60	905.00
	Inst	Ea	Sm	UE	3.13	6.40	743.00	113.00	---	856.00	904.00
Exterior wall or roof cap	Inst	Ea	Lg	UA	.667	12.00	98.50	27.50	---	126.00	152.00
	Inst	Ea	Sm	UA	.833	9.60	108.00	34.30	---	142.30	157.00

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	2080.00	181.00	---	2261.00	2640.00
	Inst	Ea	Sm	UE	6.25	3.20	2280.00	227.00	---	2507.00	2600.00
900 CFM, 1/3 HP	Inst	Ea	Lg	UE	6.67	3.00	2250.00	242.00	---	2492.00	2930.00
	Inst	Ea	Sm	UE	8.33	2.40	2480.00	302.00	---	2782.00	2900.00
1,650 CFM, 1/2 HP	Inst	Ea	Lg	UE	8.00	2.50	2680.00	290.00	---	2970.00	3490.00
	Inst	Ea	Sm	UE	10.0	2.00	2940.00	363.00	---	3303.00	3460.00
2,250 CFM, 1 HP	Inst	Ea	Lg	UE	10.0	2.00	2800.00	363.00	---	3163.00	3730.00
	Inst	Ea	Sm	UE	12.5	1.60	3080.00	453.00	---	3533.00	3720.00

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	2080.00	181.00	---	2261.00	2640.00
	Inst	Ea	Sm	UE	6.25	3.20	2280.00	227.00	---	2507.00	2600.00
1,500 CFM, 1/3 HP	Inst	Ea	Lg	UE	6.67	3.00	2100.00	242.00	---	2342.00	2760.00
	Inst	Ea	Sm	UE	8.33	2.40	2310.00	302.00	---	2612.00	2740.00
1,850 CFM, 1/2 HP	Inst	Ea	Lg	UE	8.00	2.50	2100.00	290.00	---	2390.00	2830.00
	Inst	Ea	Sm	UE	10.0	2.00	2310.00	363.00	---	2673.00	2820.00
2,200 CFM, 3/4 HP	Inst	Ea	Lg	UE	10.0	2.00	2130.00	363.00	---	2493.00	2960.00
	Inst	Ea	Sm	UE	12.5	1.60	2340.00	453.00	---	2793.00	2980.00

Direct drive

320 CFM, 11" x 11" damper	Inst	Ea	Lg	UE	5.00	4.00	251.00	181.00	---	432.00	546.00
	Inst	Ea	Sm	UE	6.25	3.20	276.00	227.00	---	503.00	598.00
600 CFM, 11" x 11" damper	Inst	Ea	Lg	UE	5.00	4.00	276.00	181.00	---	457.00	575.00
	Inst	Ea	Sm	UE	6.25	3.20	304.00	227.00	---	531.00	625.00

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

Attic

Roof-type ventilators

Aluminum dome, damper and curb

6" diameter, 300 CFM	Inst	Ea	Lg	EA	.667	12.00	210.00	26.40	---	236.40	280.00
	Inst	Ea	Sm	EA	.833	9.60	231.00	33.00	---	264.00	279.00
7" diameter, 450 CFM	Inst	Ea	Lg	EA	.727	11.00	229.00	28.80	---	257.80	305.00
	Inst	Ea	Sm	EA	.909	8.80	252.00	36.00	---	288.00	304.00
9" diameter, 900 CFM	Inst	Ea	Lg	EA	.800	10.00	370.00	31.70	---	401.70	471.00
	Inst	Ea	Sm	EA	1.00	8.00	407.00	39.60	---	446.60	464.00
12" diameter, 1,000 CFM	Inst	Ea	Lg	EA	1.00	8.00	227.00	39.60	---	266.60	319.00
	Inst	Ea	Sm	EA	1.25	6.40	250.00	49.50	---	299.50	322.00
16" diameter, 1,500 CFM	Inst	Ea	Lg	EA	1.14	7.00	274.00	45.20	---	319.20	381.00
	Inst	Ea	Sm	EA	1.43	5.60	301.00	56.70	---	357.70	384.00
20" diameter, 2,500 CFM	Inst	Ea	Lg	EA	1.33	6.00	335.00	52.70	---	387.70	462.00
	Inst	Ea	Sm	EA	1.67	4.80	369.00	66.20	---	435.20	464.00
26" diameter, 4,000 CFM	Inst	Ea	Lg	EA	1.60	5.00	405.00	63.40	---	468.40	558.00
	Inst	Ea	Sm	EA	2.00	4.00	446.00	79.30	---	525.30	560.00
32" diameter, 6,500 CFM	Inst	Ea	Lg	EA	2.00	4.00	560.00	79.30	---	639.30	759.00
	Inst	Ea	Sm	EA	2.50	3.20	616.00	99.10	---	715.10	760.00
38" diameter, 8,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	830.00	106.00	---	936.00	1110.00
	Inst	Ea	Sm	EA	3.33	2.40	913.00	132.00	---	1045.00	1100.00
50" diameter, 13,000 CFM	Inst	Ea	Lg	EA	4.00	2.00	1200.00	159.00	---	1359.00	1610.00
	Inst	Ea	Sm	EA	5.00	1.60	1320.00	198.00	---	1518.00	1610.00

Plastic ABS dome

900 CFM	Inst	Ea	Lg	EA	.667	12.00	67.00	26.40	---	93.40	115.00
	Inst	Ea	Sm	EA	.833	9.60	73.70	33.00	---	106.70	122.00
1,600 CFM	Inst	Ea	Lg	EA	.800	10.00	100.00	31.70	---	131.70	161.00
	Inst	Ea	Sm	EA	1.00	8.00	110.00	39.60	---	149.60	167.00

Wall-type ventilators, one speed, with shutter

12" diameter, 1,000 CFM	Inst	Ea	Lg	EA	.667	12.00	124.00	26.40	---	150.40	181.00
	Inst	Ea	Sm	EA	.833	9.60	136.00	33.00	---	169.00	184.00
14" diameter, 1,500 CFM	Inst	Ea	Lg	EA	.800	10.00	151.00	31.70	---	182.70	220.00
	Inst	Ea	Sm	EA	1.00	8.00	166.00	39.60	---	205.60	224.00
16" diameter, 2,000 CFM	Inst	Ea	Lg	EA	1.00	8.00	227.00	39.60	---	266.60	319.00
	Inst	Ea	Sm	EA	1.25	6.40	250.00	49.50	---	299.50	322.00

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

30" diameter, 4,800 CFM	Inst	Ea	Lg	EA	1.60	5.00	390.00	63.40	---	453.40	540.00
	Inst	Ea	Sm	EA	2.00	4.00	429.00	79.30	---	508.30	544.00
36" diameter, 7,000 CFM	Inst	Ea	Lg	EA	2.00	4.00	425.00	79.30	---	504.30	604.00
	Inst	Ea	Sm	EA	2.50	3.20	468.00	99.10	---	567.10	611.00
42" diameter, 10,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	520.00	106.00	---	626.00	751.00
	Inst	Ea	Sm	EA	3.33	2.40	572.00	132.00	---	704.00	763.00
48" diameter, 16,000 CFM	Inst	Ea	Lg	EA	4.00	2.00	680.00	159.00	---	839.00	1010.00
	Inst	Ea	Sm	EA	5.00	1.60	748.00	198.00	---	946.00	1040.00
Two speeds, ADD	Inst	Ea	Lg	---	---	---	48.50	---	---	48.50	55.80
	Inst	Ea	Sm	---	---	---	53.40	---	---	53.40	61.40

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
Entire structure, lay-down type, one speed, with shutter											
30" diameter, 4,500 CFM	Inst	Ea	Lg	EA	1.33	6.00	425.00	52.70	---	477.70	565.00
	Inst	Ea	Sm	EA	1.67	4.80	468.00	66.20	---	534.20	563.00
36" diameter, 6,500 CFM	Inst	Ea	Lg	EA	1.60	5.00	465.00	63.40	---	528.40	627.00
	Inst	Ea	Sm	EA	2.00	4.00	512.00	79.30	---	591.30	626.00
42" diameter, 9,000 CFM	Inst	Ea	Lg	EA	2.00	4.00	550.00	79.30	---	629.30	747.00
	Inst	Ea	Sm	EA	2.50	3.20	605.00	99.10	---	704.10	749.00
48" diameter, 12,000 CFM	Inst	Ea	Lg	EA	2.67	3.00	725.00	106.00	---	831.00	987.00
	Inst	Ea	Sm	EA	3.33	2.40	798.00	132.00	---	930.00	989.00
Two speeds, ADD	Inst	Ea	Lg	---	---	---	11.90	---	---	11.90	13.70
	Inst	Ea	Sm	---	---	---	13.10	---	---	13.10	15.10
12-hour timer, ADD	Inst	Ea	Lg	EA	.500	16.00	21.50	19.80	---	41.30	53.50
	Inst	Ea	Sm	EA	.625	12.80	23.70	24.80	---	48.50	59.60
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	EA	2.29	3.50	---	90.80	---	90.80	132.00
	Inst	Job	Sm	EA	2.86	2.80	---	113.00	---	113.00	164.00

Grilles**Aluminum**

Air return

6" x 6"	Inst	Ea	Lg	UA	.333	24.00	9.90	13.70	---	23.60	30.90
	Inst	Ea	Sm	UA	.417	19.20	10.90	17.20	---	28.10	35.30
10" x 6"	Inst	Ea	Lg	UA	.364	22.00	12.10	15.00	---	27.10	35.20
	Inst	Ea	Sm	UA	.455	17.60	13.30	18.70	---	32.00	39.90
16" x 8"	Inst	Ea	Lg	UA	.400	20.00	17.60	16.50	---	34.10	43.60
	Inst	Ea	Sm	UA	.500	16.00	19.40	20.60	---	40.00	48.60
12" x 12"	Inst	Ea	Lg	UA	.500	16.00	17.60	20.60	---	38.20	49.50
	Inst	Ea	Sm	UA	.625	12.80	19.40	25.70	---	45.10	55.90
24" x 12"	Inst	Ea	Lg	UA	.571	14.00	31.50	23.50	---	55.00	69.60
	Inst	Ea	Sm	UA	.714	11.20	34.70	29.40	---	64.10	76.40
48" x 24"	Inst	Ea	Lg	UA	.800	10.00	121.00	32.90	---	153.90	186.00
	Inst	Ea	Sm	UA	1.00	8.00	133.00	41.20	---	174.20	192.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	UA	2.29	3.50	---	94.30	---	94.30	134.00
	Inst	Job	Sm	UA	2.86	2.80	---	118.00	---	118.00	167.00

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	21.00	20.60	---	41.60	53.40
	Inst	Ea	Sm	UA	.625	12.80	23.10	25.70	---	48.80	59.60

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	9.10	13.70	---	22.80	29.90
	Inst	Ea	Sm	UA	.417	19.20	10.00	17.20	---	27.20	34.40
12" x 5"	Inst	Ea	Lg	UA	.364	22.00	9.90	15.00	---	24.90	32.70
	Inst	Ea	Sm	UA	.455	17.60	10.90	18.70	---	29.60	37.50
12" x 6"	Inst	Ea	Lg	UA	.364	22.00	9.10	15.00	---	24.10	31.70
	Inst	Ea	Sm	UA	.455	17.60	10.00	18.70	---	28.70	36.60
12" x 8"	Inst	Ea	Lg	UA	.400	20.00	13.30	16.50	---	29.80	38.60
	Inst	Ea	Sm	UA	.500	16.00	14.60	20.60	---	35.20	43.80
14" x 6"	Inst	Ea	Lg	UA	.444	18.00	9.90	18.30	---	28.20	37.30
	Inst	Ea	Sm	UA	.556	14.40	10.90	22.90	---	33.80	43.40
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	UA	2.29	3.50	---	94.30	---	94.30	134.00
	Inst	Job	Sm	UA	2.86	2.80	---	118.00	---	118.00	167.00

Ventilators

Base, damper, screen; 8" neck diameter

215 CFM @ 5 MPH wind	Inst	Ea	Lg	UD	2.67	6.00	55.50	94.50	---	150.00	198.00
	Inst	Ea	Sm	UD	3.33	4.80	61.10	118.00	---	179.10	228.00

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	720.00	144.00	---	864.00	1040.00
	Inst	Ea	Sm	SB	5.00	3.20	792.00	180.00	---	972.00	1050.00
1 ton cooling	Inst	Ea	Lg	SB	5.33	3.00	815.00	192.00	---	1007.00	1220.00
	Inst	Ea	Sm	SB	6.67	2.40	897.00	240.00	---	1137.00	1240.00
2.5 ton cooling	Inst	Ea	Lg	SB	8.00	2.00	1480.00	288.00	---	1768.00	2110.00
	Inst	Ea	Sm	SB	10.0	1.60	1620.00	360.00	---	1980.00	2140.00
3 ton cooling	Inst	Ea	Lg	SB	16.0	1.00	1630.00	576.00	---	2206.00	2700.00
	Inst	Ea	Sm	SB	20.0	0.80	1790.00	721.00	---	2511.00	2830.00
10 ton cooling	Inst	Ea	Lg	SF	12.0	2.00	2350.00	458.00	---	2808.00	3370.00
	Inst	Ea	Sm	SF	15.0	1.60	2590.00	572.00	---	3162.00	3410.00
15 ton cooling	Inst	Ea	Lg	SF	16.0	1.50	3280.00	610.00	---	3890.00	4650.00
	Inst	Ea	Sm	SF	20.0	1.20	3600.00	763.00	---	4363.00	4710.00
20 ton cooling	Inst	Ea	Lg	SF	32.0	0.75	4200.00	1220.00	---	5420.00	6600.00
	Inst	Ea	Sm	SF	40.0	0.60	4620.00	1530.00	---	6150.00	6830.00
30 ton cooling	Inst	Ea	Lg	SF	48.0	0.50	6230.00	1830.00	---	8060.00	9810.00
	Inst	Ea	Sm	SF	60.0	0.40	6850.00	2290.00	---	9140.00	10200.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.33	3.00	---	192.00	---	192.00	278.00
	Inst	Job	Sm	SB	6.67	2.40	---	240.00	---	240.00	348.00

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	2050.00	576.00	---	2626.00	3190.00
	Inst	Ea	Sm	SB	20.0	0.80	2260.00	721.00	---	2981.00	3300.00
3 ton cool, 13 MBHP heat	Inst	Ea	Lg	SB	32.0	0.50	2650.00	1150.00	---	3800.00	4720.00
	Inst	Ea	Sm	SB	40.0	0.40	2920.00	1440.00	---	4360.00	5000.00
7.5 ton cool, 33 MBHP heat	Inst	Ea	Lg	SB	48.5	0.33	6430.00	1750.00	---	8180.00	9920.00
	Inst	Ea	Sm	SB	61.5	0.26	7070.00	2220.00	---	9290.00	10300.00
15 ton cool, 64 MBHP heat	Inst	Ea	Lg	SB	64.0	0.25	11500.00	2310.00	---	13810.00	16600.00
	Inst	Ea	Sm	SB	80.0	0.20	12700.00	2880.00	---	15580.00	16800.00

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	2480.00	461.00	---	2941.00	3510.00
	Inst	Ea	Sm	SB	16.0	1.00	2720.00	576.00	---	3296.00	3560.00
3 ton cool, 10 MBHP heat	Inst	Ea	Lg	SB	21.3	0.75	2980.00	767.00	---	3747.00	4530.00
	Inst	Ea	Sm	SB	26.7	0.60	3270.00	962.00	---	4232.00	4670.00

Water source to air, single package

1 ton cool, 13 MBHP heat	Inst	Ea	Lg	SB	9.14	1.75	950.00	329.00	---	1279.00	1570.00
	Inst	Ea	Sm	SB	11.4	1.40	1050.00	411.00	---	1461.00	1640.00
2 ton cool, 19 MBHP heat	Inst	Ea	Lg	SB	10.7	1.50	1200.00	386.00	---	1586.00	1940.00
	Inst	Ea	Sm	SB	13.3	1.20	1320.00	479.00	---	1799.00	2010.00
5 ton cool, 29 MBHP heat	Inst	Ea	Lg	SB	21.3	0.75	2100.00	767.00	---	2867.00	3530.00
	Inst	Ea	Sm	SB	26.7	0.60	2310.00	962.00	---	3272.00	3700.00

Minimum Job Charge

	Inst	Job	Lg	SB	8.00	2.00	---	288.00	---	288.00	418.00
	Inst	Job	Sm	SB	10.0	1.60	---	360.00	---	360.00	522.00

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	3980.00	479.00	---	4459.00	5270.00
	Inst	Ea	Sm	SB	16.7	0.96	4370.00	602.00	---	4972.00	5240.00
4 ton cool, 95 MBHP heat	Inst	Ea	Lg	SB	16.0	1.00	4130.00	576.00	---	4706.00	5580.00
	Inst	Ea	Sm	SB	20.0	0.80	4540.00	721.00	---	5261.00	5580.00
10 ton cool, 200 MBHP heat	Inst	Ea	Lg	SF	60.0	0.40	9300.00	2290.00	---	11590.00	14000.00
	Inst	Ea	Sm	SF	75.0	0.32	10200.00	2860.00	---	13060.00	14400.00
30 ton cool, 540 MBHP heat	Inst	Ea	Lg	SG	160	0.20	28600.00	6270.00	---	34870.00	42000.00
	Inst	Ea	Sm	SG	200	0.16	31500.00	7840.00	---	39340.00	42800.00
40 ton cool, 675 MBHP heat	Inst	Ea	Lg	SG	200	0.16	37200.00	7840.00	---	45040.00	54200.00
	Inst	Ea	Sm	SG	246	0.13	40900.00	9650.00	---	50550.00	54900.00
50 ton cool, 810 MBHP heat	Inst	Ea	Lg	SG	267	0.12	45100.00	10500.00	---	55600.00	67000.00
	Inst	Ea	Sm	SG	320	0.10	49600.00	12500.00	---	62100.00	67800.00

Single zone, gas-fired cooling and heating

3 ton cool, 90 MBHP heat	Inst	Ea	Lg	SB	16.0	1.00	4950.00	576.00	---	5526.00	6530.00
	Inst	Ea	Sm	SB	20.0	0.80	5450.00	721.00	---	6171.00	6490.00

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	44700.00	6270.00	---	50970.00	60500.00
	Inst	Ea	Sm	SG	200	0.16	49200.00	7840.00	---	57040.00	60500.00
30 ton cool, 540 MBHP heat	Inst	Ea	Lg	SG	229	0.14	56000.00	8980.00	---	64980.00	77400.00
	Inst	Ea	Sm	SG	291	0.11	61600.00	11400.00	---	73000.00	78100.00
70 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	400	0.08	105000.00	15700.00	---	120700.00	143000.00
	Inst	Ea	Sm	SG	533	0.06	116000.00	20900.00	---	136900.00	146000.00
80 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	457	0.07	120000.00	17900.00	---	137900.00	164000.00
	Inst	Ea	Sm	SG	533	0.06	132000.00	20900.00	---	152900.00	162000.00
105 ton cool, 1,500 MBHP heat	Inst	Ea	Lg	SG	640	0.05	158000.00	25100.00	---	183100.00	218000.00
	Inst	Ea	Sm	SG	800	0.04	173000.00	31400.00	---	204400.00	219000.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	SB	5.00	3.20	---	180.00	---	180.00	261.00
	Inst	Job	Sm	SB	6.25	2.56	---	225.00	---	225.00	327.00

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	520.00	159.00	---	679.00	828.00
	Inst	Ea	Sm	EB	5.00	3.20	572.00	198.00	---	770.00	859.00
9,000 BTUH (0.75 ton cool)	Inst	Ea	Lg	EB	4.00	4.00	535.00	159.00	---	694.00	845.00
	Inst	Ea	Sm	EB	5.00	3.20	589.00	198.00	---	787.00	876.00
12,000 BTUH (1.0 ton cool)	Inst	Ea	Lg	EB	4.00	4.00	665.00	159.00	---	824.00	995.00
	Inst	Ea	Sm	EB	5.00	3.20	732.00	198.00	---	930.00	1020.00
18,000 BTUH (1.5 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	885.00	211.00	---	1096.00	1320.00
	Inst	Ea	Sm	EB	6.67	2.40	974.00	264.00	---	1238.00	1360.00
24,000 BTUH (2.0 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	1000.00	211.00	---	1211.00	1460.00
	Inst	Ea	Sm	EB	6.67	2.40	1100.00	264.00	---	1364.00	1480.00
36,000 BTUH (3.0 ton cool)	Inst	Ea	Lg	EB	5.33	3.00	1300.00	211.00	---	1511.00	1800.00
	Inst	Ea	Sm	EB	6.67	2.40	1430.00	264.00	---	1694.00	1810.00
<i>Minimum Job Charge</i>											
	Inst	Job	Lg	EA	2.67	3.00	---	106.00	---	106.00	153.00
	Inst	Job	Sm	EA	3.33	2.40	---	132.00	---	132.00	191.00

Awnings. See Canopies, page 75**Backfill. See Excavation, page 161**

Index

A

A.O. Smith water heaters .454-459
 Abbreviations used20
 Access doors375
 Accessibility
 site6
 workplace5
 Accessories
 air conditioning duct29-31
 bath39-43
 boiler264
 fiberglass panels169
 fireplaces171
 Accordion doors93
 Accurate estimating methods5
 Acoustical tile/panels
 adhesive cost21
 adhesive set22
 ceiling tile22-23
 demolition129
 dimensions21
 estimating technique21
 furring strips23-24
 installation21
 painting331
 patterns23-24
 stapled/no grid23
 suspended ceiling systems439-440
 wall tile22-23
 Acrylic
 bathtubs49-52
 diffusers278
 dome skylights427-428
 flooring, wood parquet blocks261
 Adhesives24-27
 ceiling panels22
 ceramic tile106
 drywall panels26-27
 floor panels23
 gypsum drywall panels26-27
 hardboard wall panels27
 plastic wall panels27
 polystyrene wall panels25-26
 polyurethane foam wall panels25-26
 subfloor24
 wall panels25-27
 Adjustable roof flashing451
 Adjuster, insurance5
 Adobe, brick290
 Aggregate, ready mix concrete103-105
 Air conditioning systems
 diffusers28
 ductwork29-31
 fans32
 system components28
 system units, complete35-37
 ventilation, residential33-34
 Air conditioning units
 fan coil35
 heat pumps36
 roof top36
 window37
 Air extractors, A/C duct30
 Air return, aluminum ventilation
 grilles34-35
 Air supply registers34-35
 Air tool operator
 crew rates15
 wages11

Air tools, demolition115-116
 Alarm bell157
 Aluminum
 carport, freestanding75
 columns94
 cupola roof113
 diffusers28
 ductwork, A/C29
 exterior shutters387
 garage doors221
 grilles, ventilation34
 gutters and downspouts255
 kickplates134
 roofing359
 roofing, demolition123
 sash, window glass229
 screen doors150
 screening, wire, door150
 shower and tub doors376-380
 sliding glass door144-145, 378-380
 sliding glass door, demolition128
 thresholds135
 weathervanes113
 windows463-471
 windows, demolition126-127
 wire screening, door150
 Aluminum siding
 clapboard393
 corrugated393
 demolition393
 dimensions390
 estimating390
 installation390
 panels393
 shingles393
 American Standard Products
 Americast fixtures381-382, 418-420
 bathtubs47-52
 bids447-448
 countertop bathroom sinks402-404
 kitchen sinks418-420
 pedestal sinks405-407
 shower bases381-382
 sinks418-420
 toilets443
 wall hung bathroom sinks411-412
 Americast
 shower bases381-382
 sinks418-420
 Angle bar, bathroom39, 40
 Anti-algae caulking82
 Antique bathtubs46-47
 Apron mold308
 Aqua Glass shower surround383
 Arch roof, calculating paint
 coverage327
 Architectural, cement, white105
 Archway, entrance160
 Area modification factors
 calculating12
 Canada14
 U.S.12
 Armstrong sheet vinyl352, 354
 Ash, V-grooved, paneling341
 Ash-sen, paneling341
 Ashlar pattern, tile installation23
 Asphalt shingles359-363
 demolition124, 359

Asphalt tile flooring351, 353
 Assembled package
 door units137
 Astragal molding
 oak316
 pine304
 Attic
 access doors375
 ventilation33-34
 Average costs4
 Average manhours per unit4
 demolition114
 Awning windows472-475
 Awnings
 aluminum75
 canopies75-77
 canvas77
 patio76-77
 roll-up77
 window76-77
 wood, patio192
 Axial flow fans32

B

B & B casing299
 Back band casing300
 Backfilling161
 Backsplash
 butcher block113
 ceramic tile106
 engineered stone111
 Formica106, 108, 110
 granite109
 marble109
 quartz110
 Silestone111
 stainless steel112
 Balusters, stair434
 Balustrade, curved oak437
 Band mold307
 Bar nosing, oak317
 Bar sinks423
 Bars, towel40
 Base cabinets, kitchen62-64
 installation procedure61
 Base cap, molding/trim302
 Base molding
 finger joint pine310-311
 installation298
 resin flexible319-320
 wood bullnose round corner324-325
 Base shoe
 finger joint pine310
 oak314
 oak base round corners320
 resin319
 solid pine301-302
 Basement stairs435
 Bases, shower381-382
 Basketweave fence, redwood162
 Bath accessories39-43
 costs explained38
 demolition122
 Bath caulking81-82
 anti-algae82
 mildew resistant82
 Bathroom
 sinks402-418
 wall heaters267-268

Bathroom angle bar39
 Bathroom door locksets134
 Bathroom heaters267-268
 Ceiling Heat-A-Lite267
 Ceiling Heat-A-Ventlite267
 Bathroom wallpaper453
 Bathtub wall, ceramic tile83
 Bathtubs
 acrylic49-52
 American Standard Products47-52
 antique46-47
 cast iron46-47
 demolition386
 fiberglass44
 free-standing46-47
 Kohler Products46-47, 49, 52-58
 recessed47
 remove & reset44-45, 59
 rough-in45
 shower fixture45, 47, 59
 shower tub units386
 slip resistant48
 steel48
 sunken49-52
 whirlpool49-58
 Batt insulation268-273
 demolition123
 Batten siding391
 Batts
 lattice305-306
 pine399-400
 granite318
 redwood318
 Bead casing299
 Beams
 built-up176-177
 demolition118
 dimension lumber176-179
 glu-lam230-249
 single member177-178
 Bedroom door locksets134
 Bell court casing310
 Benefits, employer paid11
 Bevel siding
 demolition125
 dimensions390
 wood395-396
 Bi-folding closet doors86-88
 Bids442, 447-448
 Birch
 blinds388
 doors147-150
 fire doors147
 paneling342
 shutters388
 Blender, kitchen172
 Blinds, exterior
 birch388
 Cellwood389
 door387
 pine387
 western hemlock388
 Block flooring, hardwood260
 Block, concrete
 demolition290
 dimensions282
 exterior walls292
 fences294-295
 foundations290-291
 heavyweight291
 lightweight291

partitions.....	293-294	Butyl caulk.....	80	elastomeric.....	82	Chimney, vent.....	449-451
retaining walls.....	290-291	BX cable.....	156	gun.....	82	Chimneys	
slump.....	295-296	Bypassing closet doors.....	89-92	latex.....	80	brick.....	284-285
walls.....	290-291	C		mildew resistant.....	82	demolition.....	284-285
walls, insulating.....	275	Cabinet crown mold.....	308	multi-purpose.....	80	factory built.....	170
Block, glass.....	297	Cabinetry.....	62-74	oil base.....	81	flashing.....	372
Blocking, demolition.....	179-180	Cabinets, kitchen.....	62-72	silicone.....	81	Chrome bath accessories.....	38
Board and batten siding		demolition.....	122	Cavity walls, insulating.....	274-275	Circline lighting fixtures.....	278
aluminum.....	390	description.....	60	CDX plywood sheathing.....	215-216	Circular area, paint coverage.....	327
wood.....	399-400	installation procedure.....	60	Cedar		Clam shell casing.....	309
Board fence systems.....	162-167	natural finish.....	332	fencing.....	162-164	Clapboard siding	
Board sheathing		painting.....	332	roofing.....	367-371	aluminum.....	393
demolition.....	215-216	quality of.....	60	siding.....	396	demolition.....	123
subfloor.....	217	Cabinets, medicine.....	41-43	Ceiling		Claw-foot bathtubs.....	46
wall.....	215	Cabinets, vanity.....	72-74	fans.....	32	Clay tile roofing.....	359-363
Board siding.....	399	Cable, service entrance.....	155	heat.....	267	demolition.....	124
demolition.....	125	Calculating		joists.....	185	Clay tile, shapes and sizes.....	283
Boilers		area modification factors.....	12	molding.....	298	Clean-up center, kitchen.....	60
accessories.....	264	overhead expenses.....	327	panels.....	22-23	Cleaning.....	328-329
conversion accessories.....	264	paint coverage.....	6	registers, air supply.....	34	Cleaning, paint preparation	
electric fired.....	261	total hourly cost.....	11	tiles.....	22-23	exteriors.....	334-335
gas fired.....	262-263	Calgon water softeners.....	462-463	Ceiling applications		interiors.....	328-329
hot water.....	261-264	Cambridge casing.....	310	drywall.....	153	Clients.....	7
oil fired.....	263-264	Canada.....	14	drywall adhesive.....	26	communication with.....	7
steam.....	261-264	adjusting factors.....	12	paint.....	330-332	evaluating.....	7
Bolted ledgers.....	191	area modification factors.....	14	plaster lath.....	345	Closet door systems.....	86-94
Bottom plates.....	192	Canopies.....	75-77	wallpaper.....	453	accordion.....	93
Box stairs.....	435-436	aluminum.....	75-77	Ceiling Heat-A-Ventlite		bi-folding.....	86-88
Box-type rain gutter.....	255	canvass.....	77	bathroom heaters.....	267	bypassing.....	89-92
Bracing.....	180	carport.....	75	Ceiling light fixtures		demolition, with track.....	126
demolition.....	118	door.....	75-76	indoor.....	278-279	hardware.....	93
Brass kickplates.....	134	roll-up.....	77	outdoor.....	280	mirrored.....	91-92
Brick		window.....	76-77	Ceiling systems, suspended.....	438	prefinished.....	88
adobe.....	290	Canvas awnings.....	77	demolition.....	438	sliding.....	89-92
chimneys.....	284-285	Cap molding.....	304	grid.....	438	track and hardware.....	93
columns.....	285-288	Cape Cod molding		tile/panels, acoustical.....	22-23	unfinished.....	86-88
concrete slump.....	296	base & shoe, pine.....	301	Ceiling/wall tile		Closets	
demolition.....	116	base, oak.....	314	demolition.....	22	kitchen utility.....	64
dimensions.....	282	base, pine.....	311	stapled.....	23	mirrored.....	91-92
mold, redwood.....	318	casing, oak.....	313-314	Cellwood shutters.....	389	Clothes dryer vent.....	374
paint, one coat.....	335	casing, pine.....	300	Cement		Coal-fired furnace.....	266
running bond.....	284-285	casing, resin.....	319	architectural.....	105	Collectors, solar.....	459-460
standard.....	284-289	Card reader, electrical.....	157	painting.....	337	mounting kits.....	460
veneer.....	288-289	Carpenter		Cement masons		Colonial molding	
walls.....	288-289	crew rates.....	15, 16, 17	crew rates.....	16	base & shoe.....	302
Bricklayer		wages.....	11	wages.....	11	casing.....	300
crew rates.....	15, 17	Carpet.....	78-79	Ceramic tile		chair rail.....	303, 325
wages.....	11	pad.....	78-79	adhesive.....	106	crown molding.....	303
Bricktender		Carport, freestanding.....	75	bathtub wall installation.....	83	spindles.....	321-323
crew rates.....	15, 17	Casement windows.....	475-486	countertops.....	84, 106	Colonial style	
wages.....	11	four ventilating lites.....	480-486	cove/base.....	84	door frames.....	132
Bridging		one ventilating lite.....	475-476	demolition.....	84	entrances.....	160
demolition.....	118	two ventilating lites.....	476-480	dimensions.....	83	shutters.....	388
solid, between joists.....	181-182	Casing		estimating techniques.....	83	Colonnades, columns.....	94-95
Bronze kickplates.....	134	finger joint pine.....	308-310	floors.....	84	Coloring, concrete.....	105
Bruner water softeners.....	462-463	oak.....	313-314	installation methods.....	83	Column headings, book,	
Builder's series spa.....	431-432	resin.....	319	mortar.....	106	explained.....	4
Building Repair Estimate.....	10	solid pine.....	299-300	wainscot cap.....	85	Columns	
Building Repair Estimate form.....	8	Cast in place concrete.....	98-105	walls.....	85	aluminum.....	94
checklist.....	6	footings.....	98-99	Chain link fence.....	164-166	brick.....	285-288
example.....	8	forming.....	100-101	Chain-drive garage door		brick, demolition.....	116
explanation.....	6, 9	foundations.....	100-101	opener.....	224	demolition.....	118
Built-in dishwashers.....	130	interior floor finishing.....	103	Chair rail molding		entrance.....	94-95
Built-in food center.....	172	reinforcing steel rods.....	102	finger joint pine.....	312	extruded aluminum.....	94
Built-up roofing		retaining walls.....	100	oak.....	316	framing.....	183
demolition.....	124	slabs.....	102	pine.....	325	framing, demolition.....	183
dimensions.....	357	Cast iron		wood bullnose round corner.....	325	wood.....	95
over concrete deck.....	365	bathroom sinks.....	415-417	Chamfer mold.....	308	Combo-fired furnaces.....	266
over existing roof.....	363-365	bathtubs.....	46-47	Change orders.....	7	Common rafters	
over wood deck.....	364	boilers.....	262, 263	Channel molding, Marlite.....	281	cut-up roofs... 196-198, 201-202	
Bullnose corner molding.....	324-325	kitchen sinks.....	420-421	Checklist, estimating.....	6	gable or hip.....	193
Burglary detection systems.....		Caulking.....	80-82	Chemical additives, concrete... 105		Communication with clients.....	7
.....	157-158	anti-algae.....	82	Chemical feed pumps,		Compactors, trash.....	448
Burners, boiler.....	264	bathtub.....	81-82	soft water systems.....	463	Composition shingle	
Butcher block countertops.....	113	butyl flex.....	80	Chesapeake casing.....	309	roofing.....	359-363
Button, doorbell.....	158			Chimes, doorbell.....	158		

Composition vinyl tile flooring.....352, 353	Cost basis, using to estimate4	Dead locks.....134	footings.....98
Compressors, air conditioning28	Cost data, accuracy.....2	Deck insulation275-276	framing118-125
Concrete	Cost difference	Decking	furring strips119
architectural.....105	new construction.....5	demolition.....192	furring strips on ceilings183
cast in place.....102	repair and remodeling.....5	roof.....203	gable ends204-205
chemical additives.....105	Counterspace, rule of thumb....60	wood patio.....192	garage doors.....126
coloring.....105	Countertop bathroom sinks.....415-417	Decorative circline lighting	glass.....227-229
demolition.....115-116	American Standard Products.....402-404	fixtures.....278	glass sliding doors128
finish grading.....97	Kohler Products.....404	Decorative molds.....307	glazed tile.....297
interior floor finishes.....96	vitreous china.....402-405	Demolition	glazing.....127
labor96, 97	Countertops.....106-113	acoustical ceiling tile129	glu-lam beams.....230-249
painting.....335, 337	butcher block.....113	adobe brick290	glu-lam ledgers.....253-254
pour and finish slabs.....102	ceramic tile.....106	aluminum roofing.....123	glu-lam products ... 120, 230-254
ready mix.....103-104	concrete.....106	aluminum siding.....393	glu-lam purlins.....249-251
reinforcing97	engineered stone111-112	asphalt shingles124, 359	glu-lam sub-purlins.....251-252
screeds.....102	Formica106-109	awning, wood192	gutters123
Concrete block	granite109-110	bath accessories122	gypsum board.....128
demolition.....117	marble109-110	bathtub.....386	gypsum panels.....128
dimensions.....282	quartz110-111	beams118, 230-249	hardboard siding124
exterior walls.....292	Silestone111-112	bevel siding125	hardwood flooring.....122
fences.....294-295	stainless steel.....112	block, concrete.....290	headers120, 184-185
foundations.....290-291	terrazzo112	blocking.....179-180	insulating ceiling tile.....129
heavyweight.....291	Country style Dutch doors.....140-141	board and batten.....399-400	insulating glass.....127
lightweight.....291	Cove	board sheathing215-216	insulation.....123
partitions.....293-294	ceramic tile.....84	bottom siding125	joists119, 185-191
retaining walls290-291	linoleum.....355	bracing118, 180	kitchen cabinets.....122
slump.....295-296	Cove molding	brick.....116	labor, average output.....114
Concrete countertops.....106	finger joint pine.....312	brick chimneys284-285	lath119
Concrete footings.....98-99	oak315	brick columns285-287	ledgers120
cast in place.....98-99	solid pine.....305	bridging118, 181-182	lintels184-185
demolition.....115	Cover, patio.....76	built-up hot roofing124	loose fill123
dimensions.....96, 98	Coverage calculations,	cabinets, kitchen.....122	lumber118-122, 176
estimating techniques.....96	painting.....327	ceiling furring strips.....183	Marlite panels.....122
installation techniques.....96	Crew compositions.....4, 15-19	ceiling joists.....119	Masonite siding.....124
labor96	Crew rates.....15-19	ceiling tile129	masonry.....116-117
Concrete foundations.....100-101	air tool operator.....15	chimneys284-285	medicine cabinets.....122
demolition.....115-116	bricklayer.....15, 17	clapboard123	molding.....122
dimensions.....96	bricktender.....15, 17	clay tile roofing124	paneling.....122
estimating techniques.....96	carpenter.....15, 16, 17	closet doors, with track126	particleboard217
installation techniques.....96	cement mason.....16	columns.....118, 183	partitions, block293-294
interior floor finishes.....96	electrician16, 18	concrete block.....117	patio framing192
labor96	equipment operator.....19	concrete block fences.....294	plaster128, 345
pour and finish slabs.....102	fence erector.....16	concrete block partitions.....293-294	plastic tile.....128
Concrete steps, painting.....337	floorlayer.....16	concrete footings.....115	plates.....120, 192
Concrete, cast in place.....98-105	glazier.....16	concrete foundations.....100	plywood.....215-217
footings.....98-99	lather.....17	concrete retaining walls.....100	plywood sheathing.....121
forming.....102	painter.....17	concrete slabs.....116	plywood siding.....125
foundations.....100-101	paperhanger.....18	corrugated roofing.....359	posts.....118, 183
interior floor finishes.....96	plasterer.....17	deck, roof.....121	quarry tile.....297
retaining walls100-101	plumber18, 19	deck, wood.....192	rafters120, 193-202
slabs.....102	roofer.....18	decking.....121, 203	receptors.....381
Condensing units, A/C.....26	sheet metal worker.....19	diagonal bracing.....118, 180	resilient flooring.....129, 351
Cone, surface area,	tile setter.....19	diagonal let-ins.....118, 180	retaining walls115-116
calculating paint coverage.....327	Crown & cornice303	dimensional lumber.....118-121, 176	rigid insulation.....123
Convertible dishwashers.....88	Crown molding	doors126	roof decking121, 203
Cooking center, kitchen.....60	finger joint pine.....312	downspouts.....123	roof sheathing.....216
Copper roofs, cupola.....113	oak315	drop siding125	roofing121, 123-124, 365
Corinthian cap, column.....94-95	solid pine.....303	drywall128, 154	rough carpentry.....118-122
Corner boards, siding.....392	wood bullnose round corner 325	entry doors.....126	screen block.....296
Corner cabinets	Cup holder.....39	excavation160-161	screen doors.....126
kitchen.....63	Cupolas.....113	exterior walls.....117	shake roof.....367
vanity.....74	Curtain rod, shower.....39	fascia.....118, 183	shakes, wood.....125
Corner guard molding.....316	Curtain-type dampers, A/C duct...31	fences, concrete block.....294	sheathing.....121, 215-217
Corner outside.....303	Curved stairways.....437	fences, masonry.....117	sheathing, subfloor.....217
Corner posts, chain link fence.166	Cylinder, surface area,	fiberboard sheathing.....215	sheet flooring.....129, 351
Corner studs, applications.....175	calculating paint coverage.....327	finish carpentry.....122	sheet metal.....123
Corner trim, solid pine.....303	D	finishes.....128-129	sheetrock.....154
Coronado casing.....309	Daily production, average.....4	fire doors.....126	shingles.....359
Corrugated aluminum	Dampers, air conditioning	firestops.....119	shingles, wood.....125, 368
demolition, roofing/siding123	fire, curtain type31	floor joists.....119	shower bases.....381
downspouts.....255	multi-blade.....31	floors, ceramic tile.....84	shower stalls.....383
roofing.....359	variable volume.....31	floors, quarry tile.....118	shower tub units.....386
siding.....393		folding closet doors.....126	siding.....123-125
Corrugated fiberglass panels..168			slabs.....102
Cosmetic box.....41			sliding closet doors.....126
			slump block.....295

slump brick.....296	installation.....130	Drawer base, kitchen.....64	Enameled steel sinks, American Standard Products.....418-420
solid bridging.....118	sink combination.....131	Drip edge flashing.....374	End posts, chain link fence.....166
steel garage doors.....126	Disposers, garbage.....225-226	Drip mold.....308	Engineered stone countertops.....111-112
stiffeners.....119	Domes, skylight.....425-427	Drop outlet, downspouts.....255-257	Entrance columns.....94-95
storm combination doors.....126	Door	Drop siding	Entrance disconnect switch.....155
stucco.....128, 345	blinds, exterior.....387	demolition.....125	Entrance doors.....138-139
studs.....203-215	canopies.....75-76	dimensions.....391	demolition.....126
subfloor.....122	chimes.....158	installation.....391	steel.....151-152
suspended ceilings.....129	jamb assemblies.....137	wood.....397-398	Entrances.....160
tile, clay or concrete.....365	sill assembly.....137	Drywall.....153-155	Equipment operator
toilets, bidets, urinals.....442	sills, exterior.....132	adhesive.....26-27	crew rates.....19
top plates.....192	switches, electrical.....157	ceiling application.....153	wages.....11
trim.....299	Door frames	ceiling panels.....154-155	Equipment unit cost, average.....4
trusses.....122	assembly.....136	demolition.....154	Estimate
underlayment.....217	Colonial.....132	dimensions.....153	adjusting for area.....12-14
vanity cabinets.....72	exterior, wood.....132	estimating techniques.....153	blank form.....10
veneer, brick.....116	Door openers, garage.....224	fire resistant.....155	charging for.....7
wall furring strips.....184	Door swing, kitchen cabinet.....60	installation techniques.....153	checklist.....6
wall sheathing.....215	Doorbell systems.....158	painting.....329-330	form.....8-10
wallboard.....128	Doors	repair, paint preparation.....329	starting.....7
wallpaper.....129	access.....375	tape joints.....154	Estimating methods.....5
walls.....121	accordion.....93	wall application.....153	Estimating techniques.....5, 6
walls, ceramic tile.....85	bi-folding.....86-88	wall panels.....154	acoustical tile.....21
walls, masonry.....116, 290	birch.....147-150	water resistant.....155	aluminum siding.....390
weather protection.....123	bypassing.....89-92	Dual glazed windows.....465, 468, 471	batten siding.....391
windows.....126-127	closet.....86-94	Duct	brick.....282
wood deck.....192	Colonial.....136	accessories.....30-31	built-up roofing.....357
wood roofing.....124	decorative glass.....138-139	furnaces.....265	ceramic tile.....83
wood shakes/shingles.....367-368	demolition.....126	Ductwork, air conditioning.....29	concrete block.....282
wood siding.....123-125	Douglas fir.....143-144	Dumpster rental.....114	concrete footings.....96
Demolition, with air tools.....115-116	Dutch.....141-142	Duolux	drop siding.....391
Description column, book.....4	entrance.....138-139	paneling.....340	drywall.....153
Designer Group spa.....432-433	fire doors.....147	pegboard.....341	fiberglass shingles.....356
Detailed estimate.....5	frames, interior.....133	Dutch doors.....141-142	finish grading.....96
importance of.....7	French.....143-144	E	forms, screeds and rods.....96, 102-103
Detectors	French, sliding.....145-146	Eaves, painting.....327	insulating tile.....21
fire.....157-158	garden.....144	Economy hardboard, paneling.....340	mortar.....344
infrared photoelectric.....157	hardboard.....147-149	Elastomeric caulking.....82	painting.....326
microwave.....157	hollow core.....147-148	Electric fired	plywood siding.....392
motion.....157	interior.....147-150	bathroom heaters.....267-268	quarry tile.....282
smoke.....157	interior systems.....136	boilers.....261	roll roofing.....356
ultrasonic.....157	Lauan.....147-149	furnaces.....265	suspended ceilings.....438
Diagonal let-ins.....180	louver.....87	Electric water heaters, solar.....459-461	vertical siding.....391
Diameter casing, resin.....319	mirrored.....91-92	Electrical work.....155-159	wallpaper.....452
Diamond lath.....344	package door units.....137	alarms.....157-158	wood shingle siding.....392
metal.....345	panel.....140-141	burglary detection systems.....157-158	wood shingles.....356
Diffusers	passage.....147-148	doorbell systems.....158	Evaluating clients.....7
acrylic.....278	prehung.....148-150	EMT.....156	Excavation.....160-161
air conditioning.....28	screen.....150	fire alarm systems.....158	Exit control locks.....157
Digging.....160	shower.....376-380	ground cable.....156	Exterior
Dimension lumber	sliding.....89-92	ground rod with clamp.....156	concrete block walls.....292
beams.....176-179	solid core.....148, 149-150	intercom systems.....159	corner framing.....175
blocking.....179-180	steel.....151-152	meter socket.....155	door frames.....132
bracing.....180	tub.....376-381	motion detectors.....157	finishes, demolition.....128-129
bridging.....181-182	with sidelights.....138-139	panelboard.....156	masonry walls demolition.....117
columns.....183	wood.....141-144	phone jack wiring.....159	molding.....312
demolition.....118-122	Doors, finishing	service entrance cable.....155	painting.....326
diagonal let-ins.....180	exterior, paint.....336	signal bell.....158	redwood molds.....318
fascia.....183	interior, paint.....331-332	smoke detector.....157	shutters.....387-389
girders.....176-179	natural finish.....332	television antenna wiring.....159	sills, doors.....132
headers.....184-185	Dormer louvers.....374	weathercap.....155	wood doors.....141-144
joists.....185-191	Double door entrances.....160	wiring.....156	Exterior key switch,
ledgers.....191	Double hung windows.....487-489	Electrician	garage door opener.....224
lintels.....184-185	Double roll top countertop, Formica.....107	crew rates.....16, 18	Extractors, air duct.....30
patio decking.....192	Double top plate.....192	wages.....11	Extruded aluminum columns.....94
plates.....192	Douglas fir	EMT.....156	Extruded polystyrene foam
posts.....183	doors.....143-144	Enameled cast iron sinks	insulation.....277
rafters.....193-202	fencing.....162-164	bar.....423	F
sheathing.....215-217	Downspouts.....255-257	bathroom.....415-417	Fabric awning.....77
solid roof decking.....203	demolition.....123	kitchen.....420-421	Fabricated ductwork, A/C.....29
studs.....203-215	drop outlet.....255-257	Kohler Products.....415-417	Factors, area modification.....12
Direct drive roof ventilator.....32	painting.....336, 338	utility.....424	Fan coil, A/C system.....35
Disconnect switch, entrance.....155	Drain detail.....38		
Dish, soap.....39	Drainage, gutters and downspouts.....255-257		
Dishwashers.....130-131			
built-in.....130			
convertible.....131			

Fans.....	32	Fixed type skylights.....	425-428	blocking.....	179-180	Gas valve, fireplace.....	171
ceiling.....	32	Fixtures, lighting.....	278-280	bracing.....	180	Gate posts, chain link fence.....	166
in-line centrifugal.....	32	Flashing.....	372-373	bridging.....	181-182	Gates	
Fascia.....	183	roof vent.....	451	columns.....	183	chain link fence.....	166
demolition.....	118	Flat Hoffco mold.....	308	demolition.....	118-125	split-rail.....	167
Fascia bracket, downspouts.....		Flat panels, fiberglass.....	168	diagonal let-ins.....	180	Georgian crown molding.....	312
Federal unemployment		Flat streamline molding.....	301	dimension lumber.....	173	Girders.....	176-179
insurance.....	11	base & base shoe.....	301	fascia.....	183	Glass	
Felt underlayment,		casing, pine.....	299	headers.....	184-185	roof windows.....	431
sheet flooring.....	350	Flexible coated ductwork,		joists.....	185-191	skywindows.....	429-430
Fence erector		A/C.....	30	ledgers.....	191	Glass and glazing.....	227-229
crew rates.....	16	Flexible moldings, resin.....	319-320	lintels.....	184-185	Glass bead & screen,	
wages.....	11	Floor finishes, concrete.....	96	patio decking.....	192	solid pine.....	304
Fence posts		Floor framing.....	175	plates.....	192	Glass block.....	297
chain link.....	164, 166	applications.....	175	posts.....	183	Glass break alarm switch.....	158
redwood.....	162-163	joists.....	185-191	rafters.....	193-202	Glass doors	
split rail.....	167	joists, demolition.....	119	rough carpentry.....	173-220	demolition.....	126, 128
Fences		Floor mounted space heaters.....	266	sheathing.....	215-217	shower.....	378-380
chain link.....	164-166	Flooring		solid roof decking.....	203	sliding.....	144-146
lateral reinforcing.....	295	ceramic tile.....	83	studs.....	203-215	tub.....	378-381
lightweight block.....	295	demolition.....	84, 118	Free-standing bathtubs.....	46-47	Glass shelf, bathroom.....	39
masonry.....	295	hardwood.....	258-261	Free-standing carport.....	75	Glazed tile.....	297
masonry, demolition.....	117	installation, wood.....	258-261	French doors.....	143-144	Glazier	
split rail.....	167	mastic.....	258	sidelites.....	144, 152	crew rates.....	16
Fiberboard sheathing.....	215	oak.....	259-260	sliding.....	145-146	wages.....	11
Fiberglass		panel adhesive.....	24	steel.....	151-152	Glazing.....	227-229
bathtubs.....	56-58	parquet.....	260-261	French, sidelites.....	144	demolition.....	127
ceiling panels.....	439-440	quarry tile.....	297	Fringe benefits.....	11	Glu-lam beams.....	230-249
garage doors.....	222	resilient.....	350-355	Front end loader,		3-1/8.....	230-233
insulation, Johns-Manville.....	268-273	Floorlayer		excavation.....	160	5-1/8.....	233-238
molding.....	169	crew rates.....	16	Fruit juicer.....	172	6-3/4.....	239-241
panels.....	168	wages.....	11	Full round molding, oak.....	317	8-3/4.....	242-245
screening, door.....	150	Floors, shower.....	381-382	Furnaces		10-3/4.....	246-249
shingles.....	356	Floors, wood		coal fired.....	266	Glu-lam products	
shower tub units.....	386	cleaning.....	328-329	combo fired.....	266	beams.....	230-249
shower units.....	386	finishing.....	333	duct.....	265	ledgers.....	253-254
1550 molding.....	300, 301	natural finish.....	333	gas fired.....	265	purlins.....	249-251
Filler strips, chain link.....	165	painting, wood.....	333	oil fired.....	266	sub-purlins.....	251-252
Filter, water.....	453-454	sealing.....	331	wall.....	267	Grab bars.....	39
Filters, water,		stainwax.....	333	wood.....	266	Grading	
soft water systems.....	463	waxing.....	333	Furring strips.....	24, 183-184	cast in place concrete.....	102
Finger joint pine moldings.....		Flue piping.....	449-451	demolition.....	119	footings.....	98
base.....	310-311	Fluorescent lighting.....	278	over plaster.....	24	slabs.....	102
casing.....	308-310	Flush doors, steel.....	151-152	over wood.....	24	Granite countertops.....	109-110
chair rail.....	312	Flush face paneling, birch.....	342	G		Gravel stop.....	373
cove molding.....	312	Fluted casing.....	309	Gable		Grid system,	
crown & cornice molding.....	312	Foam insulation.....	277	ends.....	204-205, 208-212	suspended ceiling.....	439-441
exterior mold.....	312	Foil-faced insulation.....	269, 271, 273	rafters.....	193-195, 199-200	Grid, ceiling.....	438
stool & apron.....	313	Folding closet doors.....	86-88	shakes.....	367	Grilles, aluminum.....	34
stops.....	310	demolition.....	126	shingles.....	368-370	Ground cable.....	156
Finish carpentry, demolition.....	122	Food centers,		Galvanized netting.....	347	Ground rod.....	156
Finish grading.....	98	small appliance.....	172	Galvanized steel		Grout mix.....	103-104
Finishes		Footings		ductwork, A/C.....	29	Guard, outside corner.....	303
concrete floor.....	96	cast in place.....	98-99	fence posts.....	164, 166	Guide, how to use book.....	4
demolition.....	128-129	concrete.....	96-98	Gambrel roof, calculating paint		Gun applied adhesives.....	24-27
natural.....	332-333	excavation for.....	161	coverage.....	327	Gun, caulking.....	82
paint.....	328-339	Forced warm air systems.....		Garage door openers.....	224	Gusset, framing.....	173
wood floor.....	333		265-266	Garage doors.....	221-224	Gutters and downspouts.....	255-257
Finishing, concrete floor.....	103	Formica countertops.....	106-109	demolition.....	126	cleaning.....	334
Fir, wood		cost adjustments.....	108	wood.....	223-224	demolition.....	123
decking.....	192	Forming, concrete		Garbage compactors.....	448	painting.....	327
doors, Dutch.....	141-142	footings.....	98	Garbage disposers		painting, 2-coats.....	338
flooring.....	259	foundation.....	103	Badger.....	225	Gypsum	
shutters.....	387	retaining wall.....	100-101	In-Sink-Erator.....	225	adhesive.....	26-27
Fire alarm systems.....	158	slabs.....	103	parts/accessories.....	226	lath.....	345
Fire damage.....	6	Foundation vents,		remove/reset.....	225-226	panels, demolition.....	128
Fire doors.....	147	galvanized.....	374	Garden doors.....	144	plaster.....	346
Fire-resistant drywall.....	153-155	Foundations		Garden windows.....	493-498	plasterboard.....	154-155
Fire-retardant fiberglass		concrete block.....	290-291	one fixed lite.....	493-497	H	
panels.....	168	demolition.....	100	one fixed,		Half round molding,	
Fireplaces.....	170-171	poured from truck.....	103	one sliding lite.....	497-498	solid pine.....	305
accessories.....	171	Four bead casing.....	299	Gas fired		Hand excavation.....	160
mantels.....	281	Framing.....	173-220	boilers.....	262-263	Hand rail, molding, oak.....	317
Firestops, demolition.....	119	applications.....	173	furnaces.....	265	Hand tools, definition.....	114
		beams.....	173	space heaters.....	266-267	Handlesets, door.....	134-135

Hanger applications.....	173
Hanging island cabinets.....	66
Hardboard	
adhesive.....	27
demolition.....	124
doors, interior.....	147-149
installation.....	340
paneling.....	340
plywood paneling.....	340
siding.....	393
underlayment.....	217
Hardware	
door.....	134-135
sliding door.....	89-92
Hardwood flooring	
applications.....	258-261
block.....	260
demolition.....	122
fir.....	259
machine sand.....	259, 261
maple.....	259
oak.....	259-260
parquet.....	260-261
penetrating stainwax.....	228
strip.....	259
teak.....	260
walnut.....	260
waxing.....	333
yellow pine.....	259
Hardwood molding.....	313-318
Headers.....	184-185
demolition.....	119
Heat lamp, radiant heat.....	268
Heat pumps.....	36
Heat-A-Lite.....	267
Heat-A-Ventlite.....	267
Heaters	
electric, bath.....	267-268
space heater.....	266-267
wall.....	268
wiring.....	268
Heating systems	
boilers.....	262-263
forced air.....	265-266
furnace.....	265-267
Heavyweight blocks, concrete.....	291
Help, National Estimator.....	7
Hemlock French doors.....	143-144
Hermosa casing.....	310
Hiders, identifying.....	6
Hip	
rafters.....	193-195, 199-200
shakes.....	367
shingles.....	368-371
Historical price data.....	5
collecting.....	6
Hollow core doors.....	147-148
Hoods, range.....	348-349
Hook, robe.....	39
Horizontal blocking.....	179-180
Horizontal slide aluminum windows.....	466-471
Hot air heating.....	265-267
Hot tub, whirlpool.....	431-433
Hot water boilers.....	261-264
Hourly cost, total.....	11
How to use book.....	4
I	
Ice crusher.....	172
Imitation stone countertops.....	
.....	111-112
In-line centrifugal fans.....	32
In-Sink-Erator garbage disposer.....	225

Incandescent lighting fixtures.....	
.....	279-280
Indicating panels, detection.....	157
Indoor lighting.....	278-280
Infrared lamps, Heat-A-Lite.....	267
Inspection, visual.....	7
Installation techniques	
acoustical tile.....	21
aluminum siding.....	390
batten siding.....	391
bevel siding.....	390
brick.....	282
built-up roofing.....	357-358
ceramic tile.....	83
concrete block.....	282
concrete footings.....	96
dishwasher.....	130
drop siding.....	391
drywall.....	153
fiberglass shingles.....	356
inside/outside siding corners.....	392
insulating tile.....	21
lath.....	344
molding/trim.....	298
mortar.....	344
painting.....	326
paneling.....	392
plaster.....	344
plywood siding.....	392
quarry tile.....	282
roll roofing.....	356
sheet flooring products.....	350
stucco.....	344
suspended ceilings.....	438
tile products.....	350, 391
wallpaper.....	452
wood shingle.....	356
wood shingle siding.....	392
Installation, National Estimator.....	7
instruction manual.....	7
Insulating	
block walls.....	275
cavity walls.....	274-275
glass.....	228-229
roofs.....	275-276
walls.....	275-276
Insulating tile, acoustical.....	21
ceiling.....	22-23
demolition.....	129
dimensions.....	21
wall.....	22-23
Insulation	
bat or roll.....	268-273
demolition.....	123
extruded polystyrene	
rigid foam.....	277
foil-faced.....	269, 271, 273
kraft-faced.....	269, 270, 272
loose fill.....	273-274
perlite.....	274
rafters.....	270-271
rigid.....	275-276
studs.....	272-273
unfaced.....	268, 270, 272
Vermiculite.....	274
Insurance claims adjuster.....	5
Insurance, liability.....	11
Intercom systems.....	159
Interior	
doors.....	147-150
painting.....	326
Interior doors	
frames, wood.....	133
types.....	136

Interior finishes	
concrete floor.....	96
demolition.....	128-129
painting.....	326
painting, estimating.....	326
Interlocking tile shingles.....	359-363, 365
Invoices, cataloguing.....	6
Ironworker, reinforcing, wages.....	11
Island cabinets, kitchen.....	65
J	
Jacuzzi spa.....	431-433
Jamb assembly, door.....	137
Jamb-type garage doors	
aluminum.....	221
fiberglass.....	222
steel.....	223
wood.....	223
Job summary file.....	6
variance report.....	6
Jobs, estimating.....	5
Johns-Manville fiberglass insulation.....	268-273
Joists	
bridging.....	181-182
ceiling/floor.....	185-191
demolition.....	119, 185-191
framing hanger.....	173
insulation.....	268-269, 273-274
LF of stick.....	185-188
SF of area.....	188-191
K	
Key switch, exterior, garage door opener.....	224
Kickplates.....	134
Kitchen	
counters, rule of thumb.....	60
food center.....	172
sinks.....	418-422
wallpaper.....	453
work triangle.....	60
Kitchen cabinets.....	62-72
base with drawers.....	62-63
corner base.....	65
demolition.....	122
description.....	60
drawer base.....	64
hanging island.....	66
installation procedure.....	60
island base.....	65
oven.....	67
range.....	67-68, 69-72
refrigerator.....	69
sink.....	67-68
utility closet.....	64
wall.....	69-72
with lazy Susan.....	64
Knife sharpener.....	172
Kohler Products	
bar sinks.....	423
bathtubs.....	46-47, 49, 52-58
countertop bathroom sinks.....	404-405
kitchen sinks.....	420-422
pedestal sinks.....	407-411
shower stalls.....	386
sinks.....	412-418
utility sinks.....	424
Kraft-faced insulation.....	269, 270, 272
L	
Labor	
average output, demolition.....	114
concrete installation.....	96-97

masonry installations.....	282
unit cost.....	4
Labor costs	
bath accessories.....	38
local.....	4, 12
tile patterns.....	23
Laborer	
crew rates.....	17
wages.....	11
Lacquer.....	332-333
Lantern post.....	280
Lasco	
shower stalls.....	383-385
shower tub units.....	386
Lateral reinforcing	
concrete block.....	291, 292
concrete block partitions.....	295
Latex	
caulking.....	80
paint, application.....	330-331
Lath and plaster.....	345-346
caulking.....	80
demolition.....	128-129
installation.....	344
Lather	
crew rates.....	17
wages.....	11
Lattice and battens, molding.....	305-306
redwood.....	318
Lattice, batts.....	305-306
Lauan doors.....	147-149
Lavatories.....	402-418
Lay-down type ventilators, attic.....	34
Lay-in suspended ceiling system.....	440
Layout, kitchen.....	60
Lazy Susan cabinet.....	64
Ledger, demolition.....	120
Ledgers.....	191
glu-lam.....	253-254
Let-ins, diagonal bracing.....	180
Liability insurance.....	11
Light, bathroom heater.....	267
Light, medicine cabinet.....	42
Lighting	
fixtures.....	278-280
fluorescent.....	278
incandescent.....	279
indoor.....	278-280
outdoor.....	280
porch ceiling.....	280
porch wall.....	280
post lantern fixture.....	280
track lighting.....	279
wall fixtures.....	280
Lightweight blocks, concrete.....	291
Line posts, chain link fence.....	164
Linoleum	
cove.....	355
cove molding.....	305
installation.....	350
Lintels.....	184-185
Lites, panel door.....	138-139
Loaded wage, total.....	11
Local labor rates.....	4, 12
Locks, exit control.....	157
Locksets.....	134
Log lighter, fireplace.....	171
Loose fill insulation.....	273-274
demolition.....	123
Louver	
closet doors.....	87
vents.....	374

Louvers

natural finish.....332

paint.....331

Low profile

skylights.....427-428

skywindows.....430

Lumber

beams.....176-179

blocking.....179-180

bracing.....180

bridging.....181-182

columns.....183

demolition.....118-122, 176

diagonal let-ins.....180

dimension.....176

fascia.....183

girders.....176-179

headers.....184-185

joists.....185-191

ledgers.....191

lintels.....184-185

patio decking.....192

plates.....192

posts.....183

rafters.....193-202

sheathing.....215-217

solid roof decking.....203

studs.....203-215

Lumber list.....7

Luminous panels, ceiling..439-440

M

Machine sand

hardwood flooring.....259, 261

parquetry.....260-261

Manhours per unit, average.....4

Mannington sheet vinyl.....352, 354

Mantels, fireplace.....281

Maple flooring.....259

Marble countertops.....109-110

Marble setter, wages.....11

Marble tops, vanity cabinets.....73

Marlite paneling.....281

demolition.....122

Mason, cement, crew rates.....16

Masonite

paneling, installation.....341

siding.....394

Masonite panels, Marlite.....281

Masonry.....282

adobe brick walls.....290

block dimensions.....282

brick.....290

brick veneers.....288-289

chimneys, brick.....284-285

columns, brick.....285-288

concrete block.....290-295

concrete screen block.....296

concrete slump brick.....296

demolition.....116-117

exterior walls, block.....292

fences, concrete block.....295

fences, lightweight block.....295

floors, quarry tile.....297

foundations,

concrete block.....290-291

glass block.....297

glazed tile.....297

painting.....335

partitions,

concrete block.....293-294

quarry tile.....297

retaining walls, block.....290-291

textured screen block.....296

tile.....297

walls.....290

Material pricing

acoustical tile.....21

bath accessories.....38

Material storage.....6

Material takeoff.....7

Material unit cost, average.....4

Meat grinder.....172

Medicare tax.....11

Medicine cabinets.....41-43

demolition.....122

light fixtures.....42

recessed.....42-43

sliding door.....41

surface mounted.....41-42

swing door.....42

3-way mirror.....41-42

Mediterranean design spindles.....322-323

Membrane roofing

demolition.....364

over concrete deck.....365

over existing roof.....363

over wood deck.....364

Metal joist hanger,

application.....173

Metal lath.....345

Meter socket.....155

Methods, estimating.....5

Microwave detectors.....157

Mildew resistant caulking.....82

Milled fence boards,

dog-eared.....162

Millwork and trim, paint.....331, 334

Mineral fiber ceiling panels.....23

Mineral surfaced roll roofing.....366

demolition.....124

dimensions.....356

mirror, medicine cabinet.....41-42

Mirrors.....43

3-way.....41-42

tri-view.....41-42

Mixer, kitchen.....172

Mixing box,

air conditioning duct.....31

Modification factors, area.....12

Molding and trim.....298-325

demolition.....122

1550 molding.....300, 301

installation.....298

Marlite.....281

natural finishes.....332

oak.....313-318, 325

painting.....334

pine.....299-313, 324-325

redwood.....318

resin flexible.....319-320

711 molding.....299, 301, 311, 313-314, 320

shapes.....298

spindles.....321-323

stops.....310

3-step.....299, 301

Moldings, oak

astragal.....316

bar nosing.....318

base.....314

base,

bullnose round corner.....325

casing.....313-314

chair rail.....316

cove.....315

crown & cornice.....315

full round.....317

half round.....315

hand rail.....317

nose & cove.....317

outside corner guard.....316

panel cap.....316

panel mold.....317

quarter round.....315

S4S.....317

screen mold.....316

stops.....315

Moldings, pine.....299-308

astragal.....304

base.....301-302, 310-311

base & shoe.....301-302

cap.....304

casing.....299-300, 308-310

chair rail.....303, 312

cove.....305, 312

crown & cornice.....303, 312

exterior mold.....312

flat stool.....312

glass bead & screen.....304

half round.....305

lattice.....305-306

outside corner guard.....303

panel & decorative molds.....306

quarter round.....304

stool & apron.....313

stops.....302, 310

wood bullnose round corner.....324-325

Moldings, redwood

batts.....318

exterior molds.....318

lattice.....318

Moldings, resin flexible

blocks.....319-320

diameter casing.....319

diameter casing, oak grain.....320

oak grain.....320

Moldings, spindles

colonial design.....321-322

Mediterranean design.....322-323

planter design.....321

Monterey casing.....308-310

Mortar.....344

ceramic tile.....106

installation.....344

Mosaic tile, installation.....83

Motion detectors.....157

Motorized dampers, A/C duct.....31

Mullion casing.....300

Multi-blade dampers, A/C duct.....31

Multi-purpose caulk.....80

N

Nailed ledgers.....191

National Estimator program.....7

ShowMe video.....7

Natural finishes.....332

stain.....337

Natural gas fired, boiler.....262-263

Netting, galvanized.....347

Newels, stair.....434

No wax sheet vinyl.....352, 354

Non-acoustical rated panels.....439, 440

Non-taxable benefits.....11

Nose & cove mold.....308

Nosing, roof edge flashing.....372-373

Notes section.....4

Nylon carpet.....79

O

Oak

bar nosing.....317

flooring.....259-260

paneling.....342

paneling, flush face.....342

stairways.....437

Oak grain resin molding.....320

Oak hardwood molding

astragal.....316

bar nosing.....317

base.....314

casing.....313-314

chair rail.....316

cove.....315

crown & cornice.....315

full round.....317

half round.....315

hand rail.....317

nose & cove.....317

outside corner guard.....316

panel cap.....316

panel mold.....317

quarter round.....315

S4S.....317

screen mold.....316

stops.....315

Ogee stops

oak.....315

pine.....302

Oil base caulking.....81

Oil fired

boilers.....263-264

furnaces.....266

One coat paint applications

cement base paint.....337

exterior painting.....335-337

interior painting.....329-332

latex.....330-331

latex enamel.....330-331

natural finishes.....332-333

sealer.....330

sizing.....329

stain.....337

One-flue chimneys.....284-285

Open stairs.....436

Openers, garage door.....224

Operation column.....4

OSB strand board sheathing.....216

Outdoor lighting.....280

Outside corner guard

oak.....316

solid pine.....303

Oval streamline casing.....299

Oven cabinets, kitchen.....67

Overhead and profit.....4, 6-7

Overhead expenses.....6

P

Package door units.....137

Pad, carpet.....78-79

Paint

characteristics.....326

coverage, estimating.....326

preparation.....328-329

removal.....329

Paint grade resin moldings.....319-320

Painter

crew rates.....17

wages.....11

Painting and cleaning

exterior.....334-335

interior.....326

Panel

adhesives.....24-25

doors.....140-141

molds.....307

shutters, exterior.....387

Panel siding

aluminum.....393

hardboard.....399

Masonite.....	394	Pine shutters	387	redwood fence	162	Red cedar siding	
vinyl	395	Pine siding.....	398	split rail fence	167	bevel.....	396
Panelboard	156	Pits, digging.....	160	Prefabricated fireplaces.....	170	board and batten.....	399-400
Paneling		Plain siding, painting	335	Prefinished		board on board.....	399
demolition.....	122, 340	Plane and specification sheet	7	closet doors.....	88	drop	397
hardboard.....	340	Plank and beam construction,		panel shutters	389	lap	396
Marlite	281	roof decking.....	203	Prefit casting.....	308	shakes.....	400
plywood	340	Planter design spindles	321	Prehung doors		shingles	401
Panels		Plaster	344-347	steel.....	152	Redwood	
acoustical	22-23, 439, 440	ceilings	346	wood.....	149	cupolas.....	113
adhesive set.....	22-23	demolition.....	128, 345	Preparation, painting	328-329	decking.....	192
drywall.....	154-155	installation	344	Presdwood		fence posts.....	162-163
fiberglass.....	168	painting.....	330-331	paneling.....	340	fencing.....	162-164
mineral fiber	23	sealer application	330	pegboard.....	341	lath	345
painting.....	331	sizing, paint preparation.....	329	Price data	5-6	molding.....	318
Paper, wallcovering	452	walls	346	Productivity, your company	7	siding.....	396
Paperhanger		Plasterboard, gypsum	154-155	Profit allowance	4	Refrigerator cabinets	69
crew rates.....	18	Plasterer		Project schedule.....	7	Register kit, space heaters.....	267
wages.....	11	crew rates.....	17	Propane fired boiler.....	262-263	Registers, ventilation	34-35
Parquetry, hardwood flooring	260-261	wages.....	11	Property damage appraiser.....	5	Reinforced concrete	
Particleboard		Plastic		Provincial shutters	387	cast in place	99
demolition.....	217	laminated countertops.....	106-109	Pry bar.....	114	demolition.....	115-116
subfloor	217	panel adhesives	27	Pumps, heat	36	footing	99
underlayment, installation	340	shower stalls	383-385	Purlins, glu-lam.....	249-251	foundations.....	100-101
Parting bead mold.....	307	Plates.....	192	PVC, downspouts.....	256-257	slabs.....	102-103
Partition walls		gable ends	204-205	Q		Reinforcing	
concrete block.....	293-294	LF of stick.....	203-204	Quarry tile.....	297	cast in place concrete	102-103
demolition.....	121	LF of wall.....	212-215	demolition.....	118, 297	concrete	97
framing, stud/plates.....	203	per SF of wall area.....	205-212	dimensions	282	concrete block	291-295
studs.....	205-208	walls/partitions.....	212-215	floors	297	masonry	291-295
Passage doors, interior	147-148	Plumber		Quarter round molding		Reinforcing ironworker,	
latches.....	134	crew rates.....	18, 19	oak	315	wages	11
Paste		wages.....	11	solid pine.....	304	Reinforcing steel rods.....	103
flooring installations.....	350	Plumbing accessories, costs	38	Quartz countertops.....	110-111	Remodeling jobs, estimating	5
wallpaper.....	452	Plywood paneling	340	R		Repair estimate	5
Patio		demolition.....	340	Rabbeted window stool.....	306	example.....	8-9
awnings	76	installation	340	Radiant heaters	267-268	Residential electrical work	155-156
cover	76	Plywood sheathing	215-216	Radio controlled garage door		Residential jobs, estimating.....	5
framing	192	demolition.....	121	opener	224	Resilient flooring	
Patterns, acoustical tile,		Plywood siding		Rafters.....	193-202	demolition.....	129
labor	23	board and batten.....	399-400	common	193-198	installed over concrete	351-352
Pedestal sinks	405-411	board on board.....	399	cut-up roofs ...	196-198, 201-202	sheet products	350
Pediments.....	160	demolition.....	124	demolition.....	120, 193-202	subfloor	353-354
Peel-off caulk.....	82	dimensions	392	gable or hip ...	193-195, 199-200	tile products.....	350
Pegboard, installation.....	341	installation	392	insulation	270-271	Resin flexible molding	319-320
Pendant mounted worklights	278	Pocket door frame.....	133	LF of stick.....	193-198	oak grain	320
Per measure estimating	5	Police connect panel	158	SF of area	199-202	Retaining walls	290-291
Perlite, loose fill insulation.....	274	Polish, hardwood flooring.....	259-261	Railings, stair	434	concrete	100-101
Philippine mahogany paneling.....	343	Polycarbonate dome skylights.....	425-427	Rails, spindle	323	demolition.....	100-101
Phone jack, wiring	159	Polystyrene		Rails, split rail fence	167	Ribblath	344
Photographs, before and after.....	6	foam insulation	277	Rain diverter.....	372	metal	345
Picture mold	308	molded foam shutters	389	Rain gutters	255-257	Ridge or hip application,	
Picture windows	489-492	panels, adhesive	25-26	Raised panel louver doors	136	roofing	362-363
Pilasters.....	160	Polyurethane foam panels,		Range cabinets	67-68, 69-72	Rigid conduit.....	156
Pine moldings.....	299-308	adhesive	25-26	Range hoods	348-349	Rigid foam insulation	277
astragal	304	Ponderosa pine fireplace		designer models.....	349	Rigid insulating board.....	275-276
base	301-302, 310-311	mantels.....	281	Rates, wage	11	Risers, stair	434
base & shoe.....	301-302	Pop-up drain detail	38	Ready mix concrete.....	103-104	Robe hook	39
cap	304	Porcelain enameled steel sink		Receptors, shower	381-382	Rod, shower curtain	39
casing.....	299-300, 308-310	bathroom	418	demolition	381	Roll insulation	268-269
chair rail.....	303, 312	kitchen.....	418-420, 422	Recessed		Roll roofing	365
cove.....	305, 312	Porch columns.....	94-95	bathroom ceiling heaters.....	268	demolition.....	124
crown & cornice	303, 312	Porch floors, painting		lighting.....	278	Roll valley	368-371
exterior mold	312	cement	337	medicine cabinets	42-43	Roll-up awnings.....	77
flat stool.....	313	concrete	339	wall heaters	268	Romex cable, wiring	156
glass bead & screen	304	preparation, cleaning.....	334	Rectangular ductwork, A/C.....	29	Roof	
half round	305	wood.....	336	calculating paint coverage.....	327	decking	203
lattice.....	305-306	Porch lighting.....	280	Red cedar fence, split rail.....	167	decking, demolition	121
outside corner guard	303	Portable dishwashers	131	Red cedar roofing		edge flashing.....	374
panel & decorative molds.....	307	Portland cement, ceramic tile		shakes.....	367	edging	374
quarter round	304	installation	83	shingles	368-371	flashing	372-373
stool & apron.....	313	Post-formed countertops,		Formica	106-107	flashing, adjustable	451
stops.....	302, 310	Posts.....	183	chain link fence	164, 166	insulation	275-276
window stool.....	306	chain link fence	164, 166	demolition.....	118, 183	sheathing.....	216
wood bullnose		demolition.....	118, 183	strength	6	ventilators.....	32
round corner	324-325			vents.....	374		

Roof top air conditioners	36	demolition	126	Shingles		Site work, demolition labor	114
Roof windows	431	wood	150	asphalt/fiberglass	359-363	base & base shoe	301
Roofers		Screen mold, oak	316	demolition	359	casing	300
crew rates	18	Screens, painting	336	nailed	125, 359-363	Sizing application,	
wages	11	Screw-worm garage door		roofing	359-363	paint preparation	329
Roofing	356	opener	224	tile	365	Skirt board, stair	435
aluminum	359	Sealer, application		wood, roofing	368-371	Skylights	
asphalt composition		acoustical tile or panels	330	Shoe mold/trim	310, 314, 320	acrylic dome	427-428
shingles	359-363	sheetrock or plaster	330	Shower		fixed	425-428
built-up	363-365	Sectional-type garage doors		bares/receptors	381-382	low profile	427-428
clay tile	365	aluminum	222	curtain rod	39	polycarbonate dome	425-427
composition shingles	359	fiberglass	222	demolition	381	self flashing	425-427
demolition	123-124	wood	224	fixtures	45, 59	ventilating	426-428
drip edge	374	Security, job site	6	Shower bases	381-382	Skywindows	
flashing	372-373	Self-edge countertop, Formica	108	Shower doors		insulated glass	429-430
gravel stop	373	Self-flashing skylights	425-427	hinged	376-378	low profile	429-430
membrane	363-365	Self-flashing skywindows	430	sliding	378-380	Slabs	
mineral surfaced roll	365	Selvage roll, mineral		Shower floors,		concrete	102-103
nails, estimating need	356	surfaced roll roofing	365	slip resistant	383-385	demolition	102, 116
parapet walls	357	Service entrance cable	155	Shower modules,		Sledge hammer	114
roll roofing	365	711 molding	311	space saver	383-385	Sliding doors	
sheathing paper	371	oak base	314	Shower stalls		aluminum frame	144-145
shingles	359-363	oak casing	313	demolition	383	closet	89-92
tar usage	357	pine base & base shoe	301	nonintegral	385	French	145-146
tile	365	pine casing	299	two wall models	384	glass	144-146
top coat	357	resin casing	320	Shower tub units	386	hardware	89-92
wood shakes	367	Shake roof	367	ShowMe video	7	shower	378-380
wood shingles	368-371	demolition	367	Shutters, exterior		tub	378-381
Roofs, wood shingle	368-371	Shake siding	400	aluminum, louvered	387	Slip-resistant shower floors	
staining	337	demolition	125	birch	388		383-385
Rosette plinth block		Shear panel, adhesives	25	Cellwood	389	Slump block,	
base & base shoe	302	Sheathing		fir	387	concrete walls	295-296
casing	300	applications, framing	174	pine	387	Slump brick, concrete walls	296
Rough carpentry, framing	173-220	demolition	121	western hemlock	388	Smith, A.O.,	
beams	176-179	paper	371	Shutters, painting	338	water heaters	454-459
blocking	179-180	roof	216	Sidelites	138-139, 144	Smoke detectors	158
bracing	180	subfloor	217	French	144, 152	Soap dish	39
bridging	181-182	wall	215	Siding	390-401	Soap holder	39
columns	183	Sheet flooring products,		aluminum	393	Social Security	11
demolition	118-125	installation	350	battens	392	Socket, meter	155
diagonal let-ins	180	Sheet metal		bevel	395	Softeners, water	462-463
dimension	176	access doors	375	board and batten	399-400	Soil type	6
fascia	183	clothes dryer vent set	374	board on board	400	Solar block, fiberglass	168
girders	176-179	demolition	123	clapboard	390	Solar collectors	459-460
headers	184-185	dormer louvers	374	demolition	123-125	mounting kits	460
joists	185-191	flashing	372-373	drop	397-398	storage tanks	461
ledgers	191	foundation vents	374	furring strips	392	Solar water heating	
lintels	184-185	gravel stop	373	hardboard	394	systems	459-461
patio decking	192	roof edging	374	Masonite	394	Solid bridging	181-182
plates	192	roof flashing	372-373	painting	337	Solid core doors	148, 149-150
posts	183	utility louvers	375	pine	398	Solid pine molding	
rafters	193-202	vents	374-375	plywood	400	astragal	304
sheathing	215-217	vertical chimney flashing	372	shake	400	base & base shoe	301-302
solid roof decking	203	Z bar flashing	372	shingles	401	cap	304
studs	203-215	Sheet metal worker		vinyl	394	casing	299-300
Rough fence board,		crew rates	19	wood	395-396	chair rail	303
squared ends	163	wages	11	Silestone countertops	111-112	cove	305
Rough-in, bathtub	45	Sheet vinyl flooring	350	Silicone caulking	81	crown & cornice	303
Running bond		demolition	129	Sill assembly, door	137	glass bead & screen	304
adobe brick	290	Sheetrock	153-155	Sill plates	192	half round	305
concrete slump brick	296	ceilings	154-155	Single top plate	192	lattice	305-306
standard brick	285-288	demolition	154	Sink		outside corner guard	303
textured screen block	296	repair, paint preparation	329	Sink cabinets		panel & decorative molds	307
S		sealer application	330	kitchen base	67-68	quarter round	304
S4S molding	305-306	sizing	329	vanity	72-74	Solid pine, molding	299-308
oak	317	tape joints	154	Sinks		Solid roof decking	203
Sample Building Repair		walls	154-155	bar	423	Soundness of structure	6
Estimate form	8	Shelf		bathroom	402-418	Space heaters	267-268
Sanding		glass, bathroom	39	countertop	415-417	Spas, Jacuzzi	431-433
hardwood flooring	259, 261	towel supply	40	kitchen	418-422	trim kit	433
paint preparation	328-329	Shellac	332-333	pedestal	405-411	Special systems, electrical	157-159
Schedule, project	7	Shingle roofs, wood	368-371	undercounter	404	Spindle rails	323
Screeds, concrete	102	stain	337	utility	424	Spindles	
Screen doors		Shingle siding		wall hung	411-415	colonial design	321-322
aluminum frame	150	aluminum	394	Site accessibility	6	Mediterranean design	322-323
		stain	337			planter design	321
		wood	401				

rails.....323	Stucco.....344-347	clay, roofing.....365	Tub doors
western hemlock.....321-323	demolition.....128	demolition.....365	hinged.....376-378
Split rail fence.....167	exterior walls.....347	glazed.....297	sliding.....381
Spotlight, indoor.....279	installation.....344	installation.....350	Tub, bath
Spring steel ductwork, A/C.....30	painting.....335, 338	insulating.....21	acrylic.....49-52
Sprung cove molding.....305	Stucco mold.....312	mineral fiber.....23	antique.....46-47
Square surface area,	redwood.....318	painting.....335, 338	cast iron.....44-46, 53-56
paint coverage.....327	Stud arrangement, framing.....175	quarry.....297	combination tub/shower.....386
Stain.....332	Studs	resilient flooring.....351-354	demolition.....386
Stainless steel countertops.....112	bracing.....180	resilient flooring,	enameled steel.....45-46
Stainless steel sinks	demolition.....121, 203-215	demolition.....129	fiberglass.....56-58
kitchen.....422	gable ends.....208-212	shingles.....365	free-standing.....44, 46-47
Kohler Products.....423	horizontal blocking.....179-180	Tile setter	recessed.....47-48
Stainwax, penetrating, hardwood	insulating.....272-273	crew rates.....19	remove and reset.....44-45, 59
floors.....331	LF of stick.....203-204	wages.....11	rough-in.....45
Stairs.....434-437	LF of wall.....212-215	Tile setter helper, wages.....11	steel.....44, 48
balusters.....434	SF of wall area.....205-212	Toilet roll holder.....40	sunken.....44-45, 49-52
balustrade, curved.....437	Sub-purlins, glu-lam.....251-252	Toilets	whirlpool.....44-45, 47-58
basement.....435	Subfloor	American Standard Prod.....443	Two coat paint applications
box-type.....435-436	adhesive.....24	floor mounted.....443-446	cement base paint.....339
carpeting.....79	demolition.....122	Kohler Products.....444, 446	enamel.....337-339
curved, oak.....437	sheathing.....217	one piece,	exterior painting.....337-339
newels.....434	Sunken bathtubs.....44-45, 49-52	floor mounted.....443-444	interior painting.....333-334
nosing, mitered return.....435	remove.....59	remove and reset.....442	latex.....333-334
open type.....436	Supply shelf, towel.....40	wall mounted.....446	stain.....339
railings.....434	Surface repair, paint	water saver models.....442-446	Two-flue chimneys.....284-285
risers.....434	preparation.....328-329	Tongue & groove roof decking.....203	2 round edge casing.....299
shop fabricated.....435-437	Surface-mounted	Toothbrush holder.....39	275 casing.....310
skirt board.....435	light fixtures.....278-280	Top plates.....192	
treads.....435	Suspended ceilings	Top set base, flooring.....355	U
Stalls, shower.....383-385	complete systems.....439	Total hourly cost, calculating.....11	Undercounter sinks.....404
Standard brick.....284-289	demolition.....129, 439	Towel	Underlayment,
Standard drywall.....153	estimating materials.....438	bars.....40	particleboard.....340
Stapled ceiling/wall tile.....23	grid system components.....441	ladders.....40	Unemployment insurance.....11
Stationary slat blinds.....388	installation procedures.....438	pins.....40	Unfaced insulation.....
Steam boilers.....261-264	panels only.....440	rings.....40	268, 270, 272
Steel	Suspension mounted space	shelves.....40	Unfinished closet doors.....86-88
bathtubs.....48	heaters.....266	Track lighting.....279	Unfinished hardwood plywood.....
boilers.....169-170	Swing door	Track, sliding door.....93	341-343
gutters and downspouts.....255-256	cabinets.....42-43	Track-type garage doors	Universal casing.....300
Steel doors	shower.....376-378	aluminum.....222	resin.....319
decorative, dual glazed.....151	Switchmats.....158	fiberglass.....222	Urinals.....442
embossed raised panel.....151	Symbols used in book.....20	steel.....223	Utility closets, kitchen.....64
flush.....152	System components, A/C.....28-31	wood.....224	Utility louvers, vents.....375
French.....152	System units, A/C.....35-37	Tractor backhoe, excavation.....161	Utility sinks,
garage doors.....223	T	Transformer, doorbell.....158	Kohler Products.....424
prehung package.....152	Tape joints, drywall.....154	Transmitters, garage door	V
Steel posts,	Taping compounds, drywall.....153	opener.....224	V-grooved paneling.....341-343
chain link fence.....164, 166	Tarkett sheet vinyl.....352, 354	Trash compactors.....448	Valley roll.....363-365
Steel reinforcing	Taxable fringe benefits.....11	Treads, stair.....435	Vanity cabinets.....72-74
concrete.....101	Taxes, employer.....11	Trenching.....161	marble top.....73
masonry.....291-295	Teak flooring.....260	Tri-view mirror,	remove and reset.....74
Steel sash, window glass.....227-228	Techniques, estimating.....5, 6	medicine cabinet.....41-42	2-door.....73
Steps, painting	Telephone	Triangular surface area,	Variable volume dampers,
cement.....337	dialer.....158	calculating paint coverage.....327	A/C duct.....31
concrete.....339	wiring.....159	Trim	Varnish.....332-333
wood.....336	Television antenna wiring.....159	casing.....299-300	Veneer, brick.....288-289
Stick by stick estimating.....5	Tempered glass.....229	demolition.....299	demolition.....116
Stiffeners.....180	door.....144-145	finger joint pine.....308-313	Vent chimney.....449-451
demolition.....119	Terrazzo countertops.....112	oak.....313-318	dampers.....449
Stile and rail raised	Terrazzo setter, wages.....11	oak grain resin.....320	Ventilating skylights.....426-428
panel doors.....140-141	Thermostat wiring.....159	painting.....331, 333	Ventilating systems.....28-31
Stone mason, wages.....11	3-step molding	redwood.....318	Ventilation.....449-451
Stool & apron mold.....313	base & base shoe.....301	solid pine.....299-308	residential.....33-34
Stops, molding.....310	casing.....299	Trim and molding.....298-325	Ventilators
ogee, oak.....315	364 casing	Trim kit, spa.....433	attic.....33-34
ogee, pine.....302	oak.....313	Truck driver, wages.....11	base.....35
rounded edge, oak.....315	pine.....300	Truss	lay-down type.....34
Storm windows, painting.....336	resin.....320	construction, W-type.....173	roof.....32-33
Streamline molding.....301	Thresholds	demolition.....122	round top.....451
casing, oak.....313	aluminum.....135	shop fabricated,	wall type.....33
Strip flooring,	oak.....133	wood.....218-220	Vents.....374-375
installation.....258-259	wood.....133	Tub caulking.....81-82	access doors.....375
Strip lighting.....278	Tile	anti-algae.....82	attic access.....375
Structural soundness.....6	acoustical treatment.....22-23	mildew resistant.....82	clothes dryer.....374
	ceramic.....83-85, 106		

dormer louvers.....	374	Wallpaper.....	452-453	vertical slide.....	463-466	dimension.....	118-125
foundation.....	374	demolition.....	129	wood.....	472-498	fascia.....	183
louver.....	374-375	Walls		Wire lath.....	347	girders.....	176-179
utility louver.....	375	acoustical tile.....	22-23	Wiring		hanger, joist.....	173
Vermiculite loose fill		adobe brick.....	290	burglary detection systems.....		headers.....	184-185
insulation.....	274	brick veneer.....	288-289		157-158	joists.....	185-191
Vertical		cavity, insulating.....	274-275	doorbell systems.....	158	ledgers.....	191
chimney flashing.....	372	cement, painting.....	339	electrical service.....	156	lintels.....	184-185
dampers, A/C duct.....	26	ceramic tile.....	85	fire alarm systems.....	158	patio decking.....	192
reinforcing, concrete block.....	292	ceramic tile demolition.....	85	food centers.....	172	plates.....	192
siding, dimensions.....	391	concrete block.....	290-291	intercom systems.....	159	posts.....	183
slide aluminum windows.....		framing.....	205-208	outlets.....	156	rafters.....	193-202
.....	463-466	furring strips.....	184	range hoods.....	348-349	sheathing.....	215-217
Vertical crown molding,		insulating.....	275-277	switches.....	156	solid roof decking.....	203
fiberglass.....	169	masonry, demolition.....	116-117	telephone jacks.....	159	studs.....	203-215
Vibrating plate compaction.....	161	partition.....	205-208	television antennas.....	159	Wood lath.....	344
Victorian casing, oak.....	314	plaster.....	346	thermostat.....	159	Wood molding	
Video, ShowMe.....	7	retaining.....	290-291	wall heaters, bathroom.....	268	finger joint pine.....	308-313
Vinyl		screen block.....	296	WM 374 casing.....	309	oak.....	313-318
base molding.....	355	shower.....	383-385	Wood		redwood.....	318
gutters and downspouts.....		slump block.....	296	columns.....	95, 183	solid pine.....	299-308
.....	256-257	slump brick.....	296	countertops, butcher		wood bullnose round	
sheet flooring.....	351-354	stucco.....	347	block.....	113	corner.....	324-325
siding.....	395	studs.....	13	cupolas.....	113	Wood paneling	
tile flooring.....	351-354	studs/plates.....	205-208	decks.....	192	demolition.....	122, 340
wallpaper.....	452	Walnut flooring.....	260	fences.....	162-164	hardboard.....	340-343
wallpaper, demolition.....	129	Water closets.....	442-446	lath.....	345	particleboard.....	340
Vinyl coated mineral		Water filters.....	453-454	patios.....	192	plywood.....	341-343
fiber tile.....	22-23	soft water systems.....	463	sash, window glass.....	227-228	Wood roofing	
Visual inspection.....	7	Water heaters		screen doors.....	150	accessories.....	371
Vitreous china sinks		A.O. Smith.....	454-459	shutters.....	387-388	demolition.....	121, 124
American Standard Products.....		accessories.....	461	thresholds.....	135	dimensions.....	356
.....	402-404, 411-412	cabinets/stands.....	459	windows.....	472-498	shakes.....	368-371
bathroom.....	402-415	electric.....	454-457	Wood doors.....	141-144	shingles.....	368-371
Kohler Products.....		gas.....	457-459	Dutch.....	141-142	Wood sheathing	
.....	407-411, 412-415	solar.....	459-461	fire, natural birch.....	147	applications.....	174
utility.....	424	Water softeners		frames, exterior.....	132	board.....	215-216
Vitreous china toilets.....	442-446	Bruner.....	462-463	French.....	143-144, 145-146	fiberboard.....	215
Volume control dampers,		Calgon.....	462-463	garage doors.....	223-224	hardboard.....	217
A/C duct.....	31	chemical feed pumps.....	463	garden.....	144	particleboard.....	217
W		storage tanks.....	462	hollow core.....	149	plywood.....	215-216
W-truss		water filters.....	463	interior.....	147-150	roof.....	216
construction methods.....	173	Water-resistant drywall.....	153-155	raised panel.....	142	subfloor.....	217
shop fabricated,		Wax, flooring.....	259-261	screen.....	150	underlayment.....	217
wood.....	218-220	Weather protection,		sliding glass.....	145-146	wall.....	215
Wage rates.....	11	demolition.....	123	solid core.....	149-150	Wood siding	
all trades.....	11	Weathercap.....	155	threshold.....	133	bevel.....	390
craft compositions.....	15-19	Weathervanes.....	113	Wood flooring		board and batten.....	399-400
Wainscot, ceramic tile.....	85	Well cap, downspouts.....	256-257	applications.....	258-261	board on board.....	400
installation.....	83	Well outlet, downspouts.....	256-257	block.....	258	demolition.....	125
Wall cabinets, kitchen.....	69-72	Western hemlock		cleaning.....	328-329	dimensions.....	392
installation procedure.....	60	shutters.....	388	finishing.....	333	drop.....	397-398
Wall heaters		spindles.....	321-323	fir.....	259	estimating.....	390
bathroom.....	268	Whirlpool bath.....	44-45, 47-58	maple.....	259	installation.....	390
furnace.....	268	spa.....	431-433	natural finish.....	333	plywood.....	400
recessed.....	268	White cement.....	105	oak.....	259-260	shakes.....	400
space heaters.....	266-267	Window		painting, wood.....	334	shingle siding.....	392, 401
Wall hung bathroom sinks		molding, stool.....	306	parquet.....	260-261	vertical.....	399-400
American Standard Products.....		painting.....	338	sealing.....	331	Wood steps, painting.....	336
.....	411-412	painting, finishing.....	332-333	stainwax.....	331	Woodburning fireplaces.....	170
Kohler Products.....	412-415	repair/reputty.....	335	strip.....	258	Work triangle, kitchen.....	60
Wall insulation.....	275-277	unit air conditioners.....	37	teak.....	260	Workers' compensation.....	11
demolition.....	123	Windows.....	463-498	walnut.....	260	Workplace accessibility.....	5
Wall lighting fixtures.....	280	aluminum.....	463-471	waxing.....	333	X, Y, Z	
Wall molding, ceiling grid		awning.....	472-475	yellow pine.....	259	X-type bridging.....	181
systems.....	441	casement.....	475-486	Wood framing		XPS rigid foam insulation.....	277
Wall mounted urinals.....	447-448	demolition.....	126-127	beams.....	176-179	Yellow pine flooring.....	259
Wall outlets, wiring.....	156	double hung.....	487-489	blocking.....	179-180	Z bar flashing.....	372
Wall sheathing.....	215	garden.....	493-498	bracing.....	180		
adhesives.....	25-27	horizontal slide.....	466-471	bridging.....	181-182		
Wall type ventilators, attic.....	33	picture.....	489-492	columns.....	183		
Wallboard		roof.....	431	demolition.....	176		
demolition.....	128	sky.....	429-430	diagonal let-ins.....	180		
drywall application.....	153						

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