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**2023**

# **NATIONAL CONSTRUCTION ESTIMATOR**

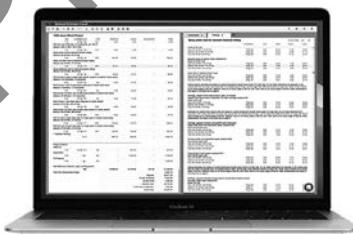
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**Edited by Richard Pray**

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# Contents

## A complete index begins on page 640

<b>How to Use This Book .....</b>	<b>3-5</b>
<b>Abbreviations and Symbols .....</b>	<b>6</b>
<b>Craft Codes and Crews .....</b>	<b>7-9</b>
<b>Residential Division Labor Cost.....</b>	<b>10</b>
<b>Adjusting Labor Costs .....</b>	<b>11</b>
<b>Area Modification Factors .....</b>	<b>12-15</b>
<b>Credits and Acknowledgments .....</b>	<b>16</b>
<b>Residential Division .....</b>	<b>17-305</b>
Adhesives .....	17
Basement doors .....	23
Building permit fees .....	28
Cabinets, kitchen .....	29
Carpentry, rule of thumb .....	32
Carpentry, assemblies .....	33
Carpentry, piecework rates .....	37
Carpentry, detailed breakdown .....	39
Carpentry, finish work .....	52
Carpentry, steel .....	57
Ceilings, suspended .....	79
Concrete work .....	84
Decking .....	98
Demolition .....	100
Doors, jambs, frames, and trim .....	105
Electrical work, subcontract .....	127
Elevators and lifts, subcontract .....	133
Excavation and backfill .....	135
Fences .....	142
Fire sprinkler systems .....	150
Flooring .....	153
Framing connectors .....	159
Garage doors .....	164
Glass, glazing .....	166
Gutters and downspouts .....	167
Gypsum drywall and accessories .....	168
Hardware .....	169
Heating and cooling .....	172
Insulation .....	181
Insurance and bonding .....	185
Landscaping .....	187
Lighting fixtures .....	190
Log home construction .....	192
Lumber and plywood .....	194
Markup (overhead and profit) .....	208
Masonry .....	209
Moldings .....	222
Paint removal .....	233
Paints, coatings, and supplies .....	234
Paneling .....	242
Paving .....	243
Plastering .....	244
Plumbing fixtures and equipment .....	245
Plumbing and heating piping .....	251
Roofing .....	255
Sheet metal .....	267
Siding .....	274
Skylights .....	277
Stairs .....	281
Taxes, Payroll .....	285
Tile .....	287
Wallcoverings .....	293
Windows .....	297
<b>Construction Economics Division.....</b>	<b>307</b>
<b>Industrial &amp; Commercial Division Labor Cost.....</b>	<b>309</b>
<b>Industrial and Commercial Division.....</b>	<b>310-639</b>
<b>01 General Requirements .....</b>	<b>310-332</b>
<b>02 Existing Conditions .....</b>	<b>332-338</b>
<b>03 Concrete .....</b>	<b>338-371</b>
Concrete formwork .....	339
Reinforcing steel .....	346
Foundations .....	361
<b>04 Masonry .....</b>	<b>371-382</b>
Reinforcing and flashing .....	372
Brick and block walls .....	373
<b>05 Metals .....</b>	<b>383-389</b>
Structural steel .....	383
Steel floor and roof decking .....	384
<b>06 Wood and Composites .....</b>	<b>389-397</b>
Framing carpentry .....	389
<b>07 Thermal &amp; Moisture Protection .....</b>	<b>397-412</b>
Thermal insulation .....	398
Roof insulation .....	399
Membrane roofing .....	401
<b>08 Openings .....</b>	<b>412-423</b>
Metal doors .....	412
Hardware .....	420
<b>09 Finishes .....</b>	<b>423-440</b>
Gypsum wallboard .....	423
Ceilings and flooring .....	429
<b>10 Specialties .....</b>	<b>440-449</b>
Partitions .....	443
<b>11 Equipment .....</b>	<b>449-470</b>
<b>12 Furnishings .....</b>	<b>470-475</b>
<b>13 Special Construction .....</b>	<b>475-488</b>
<b>14 Conveying Equipment .....</b>	<b>488-491</b>
<b>21 Fire Suppression .....</b>	<b>491-493</b>
<b>22 Plumbing .....</b>	<b>494-535</b>
Pipe and fittings .....	494
Hangers and supports .....	516
Valves, pumps, gauges .....	519
<b>23 HVAC .....</b>	<b>535-541</b>
Gas fired heaters .....	535
Hydronic & steam heating .....	537
<b>26 Electrical .....</b>	<b>541-588</b>
Rigid steel conduit .....	543
EMT conduit and wire .....	546
PVC conduit and wire .....	551
Conduit supports & hangers .....	554
Wire and cable .....	557
Lighting .....	582
<b>27 Communications .....</b>	<b>589-594</b>
<b>31 Earthwork .....</b>	<b>594-609</b>
Excavation and backfill .....	597
Shoring, bulkheads, piles .....	605
<b>32 Exterior Improvements .....</b>	<b>609-626</b>
Paving and curbs .....	609
Fencing and gates .....	617
<b>33 Utilities .....</b>	<b>626-639</b>
Pressure water pipe .....	628
Drain pipe .....	631
<b>Index .....</b>	<b>640</b>

# This Book Is an Encyclopedia of 2023 Building Costs

The 2023 National Construction Estimator lists estimated construction costs to general contractors performing work with their own crews. Overhead and profit are not included.

## National Estimator Cloud

This manual is also available by subscription on the Web. *National Estimator Cloud* includes all ten of Craftsman's 2023 construction cost estimating references. Each of these manuals has about 400 pages of current labor and material costs for construction – all neatly organized and indexed. Use these costs to build estimates and bids for nearly any type of project. Your work is kept secure on the Web. *National Estimator Cloud*:

- Prints estimates, bids and invoices as Word, Excel or Postscript documents.
- Supports progress invoices. *National Estimator Cloud* remembers what been billed so far and what's yet to be billed.
- Runs as a secure app on the Web so you can write estimates anywhere you have a Web connection.
- Exports invoices to QuickBooks, either desktop or the online.
- Bids and invoices can show as much or as little detail as you want.
- Material costs are updated regularly as prices change.
- Costs only a few dollars a month. Cancel any time you want.

As the owner of this manual, you're entitled to a substantial discount on a 10-month license to *National Estimator Cloud*. Details are inside the back cover of this manual.

**This Manual Has Two Parts;** the Residential Construction Division begins on page 17. Use the figures in this division when estimating the cost of homes and apartments with a wood, steel or masonry frame. The Industrial and Commercial Division begins on page 308 and can be used to estimate costs for nearly all construction not covered by the Residential Division.

The Residential Construction Division is arranged in alphabetical order by construction trade and type of material. The Industrial and Commercial Division follows MasterFormat™ 2004. A complete index begins on page 640.

## Material Costs

**Material Costs** for each item are listed in the column headed "Material." These are neither retail nor wholesale prices. They are estimates of what most

contractors who buy in moderate volume will pay suppliers as of early-2023. Discounts may be available for purchases in larger volume.

Material costs can change rapidly. Material prices in *National Estimator Cloud* are revised as material prices change. See the inside the back cover of this manual for more on *National Estimator Cloud*.

**Add Delivery Expense** to the material cost for other than local delivery of reasonably large quantities. Cost of delivery varies with the distance from source of supply, method of transportation, and quantity to be delivered. But most material dealers absorb the delivery cost on local delivery (5 to 15 miles) of larger quantities to good customers. Add the expense of job site delivery when it is a significant part of the material cost.

**Add Sales Tax** when sales tax will be charged to the contractor buying the materials. *National Estimator Cloud* makes it easy to add sales tax to your estimates, bids and invoices.

**Waste and Coverage** loss is included in the installed material cost. The cost of many materials per unit after installation is greater than the purchase price for the same unit because of waste, shrinkage or coverage loss during installation. For example, about 120 square feet of nominal 1" x 4" square edge boards will be needed to cover 100 square feet of floor or wall. There is no coverage loss with plywood sheathing, but waste due to cutting and fitting will average about 6%.

Costs in the "Material" column of this book assume normal waste and coverage loss. Small and irregular jobs may require a greater waste allowance. Materials priced without installation (with no labor cost) do not include an allowance for waste and coverage except as noted.

## Labor Costs

**Labor Costs** for installing the material or doing the work described are listed in the column headed "Labor." The labor cost per unit is the labor cost per hour multiplied by the manhours per unit shown after the @ sign in the "Craft@Hours" column. Labor cost includes the basic wage, the employer's contribution to welfare, pension, vacation and apprentice funds and all tax and insurance charges based on wages. Hourly labor costs for the various crafts are listed on page 10 (for the Residential Division) and page 309 (for the Industrial and Commercial Division).

Hourly labor costs used in the Industrial and Commercial Division are higher than those used in the Residential Division, reflecting the fact that craftsmen on industrial and commercial jobs are often paid more than craftsmen on residential jobs.

**Supervision Expense** to the general contractor is not included in the labor cost. The cost of supervision and non-productive labor varies widely from job to job. Calculate the cost of supervision and non-productive labor and add this to the estimate.

**Payroll Taxes and Insurance** included in the labor cost are itemized in the sections beginning on pages 185 and 285.

**Manhours per Unit** and the Craft performing the work are listed in the "Craft@Hrs" column. Pages 7 through 9 explain the "Craft@Hrs" column. To find the units of work done per man in an 8-hour day, divide 8 by the manhours per unit. To find the units done by a crew in an 8-hour day, multiply the units per man per 8-hour day by the number of crew members.

**Manhours Include** all productive labor normally associated with installing the materials described. This will usually include tasks such as:

- Unloading and storing construction materials, tools and equipment on site.
- Moving tools and equipment from a storage area or truck on site at the beginning of the day.
- Returning tools and equipment to a storage area or truck on site at the end of the day.
- Normal time lost for work breaks.
- Planning and discussing the work to be performed.
- Normal handling, measuring, cutting and fitting.
- Keeping a record of the time spent and work done.
- Regular cleanup of construction debris.
- Infrequent correction or repairs required because of faulty installation.

**Adjust the Labor Cost** to the job you are figuring when your actual hourly labor cost is known or can be estimated. The labor costs listed on pages 10 and 309 will apply within a few percent on many jobs. But labor costs may be much higher or much lower on the job you are estimating.

If the hourly wage rates listed on page 10 or page 309 are not accurate, divide your known or estimated cost per hour by the listed cost per hour. The result is your adjustment for any figure in the "Labor" column for that craft. See page 11 for more information on adjusting labor costs.

*National Estimator Cloud* makes it easy to compile estimates using your own labor rates.

**Adjust for Unusual Labor Productivity.** Costs in the labor column are for normal conditions: experienced craftsmen working on reasonably well planned and managed new construction with fair to good productivity. Labor estimates assume that materials are standard grade, appropriate tools are on hand, work done by other crafts is adequate, layout and installation are relatively uncomplicated, and working conditions don't slow progress.

Working conditions at the job site have a major effect on labor cost. Estimating experience and careful analysis can help you predict the effect of most changes in working conditions. Obviously, no single adjustment will apply on all jobs. But the adjustments that follow should help you produce more accurate labor estimates. More than one condition may apply on a job.

- Add 10% to 15% when working temperatures are below 40 degrees or above 95 degrees.
- Add 15% to 25% for work on a ladder or a scaffold, in a crawl space, in a congested area or remote from the material storage point.
- Deduct 10% when the work is in a large open area with excellent access and good light.
- Add 1% for each 10 feet that materials must be lifted above ground level.
- Add 5% to 50% for tradesmen with below average skills. Deduct 5% to 25% for highly motivated, highly skilled tradesmen.
- Deduct 10% to 20% when an identical task is repeated many times for several days at the same site.
- Add 30% to 50% on small jobs where fitting and matching of materials is required, adjacent surfaces have to be protected and the job site is occupied during construction.
- Add 25% to 50% for work done following a major flood, fire, earthquake, hurricane or tornado while skilled tradesmen are not readily available. Material costs may also be higher after a major disaster.
- Add 10% to 35% for demanding specs, rigid inspections, unreliable suppliers, a difficult owner or an inexperienced architect.

*National Estimator Cloud* makes it easy to adjust estimates for unusual labor productivity.

**Use an Area Modification Factor** from pages 12 through 15 if your material, hourly labor or equipment costs are unknown and can't be estimated.

Here's how: Use the labor and material costs in this manual without modification. Then add or deduct the percentage shown on pages 12 through 15 to estimated costs to find your local estimated cost.

Area cost modifications in *National Estimator Cloud* will adjust all costs in this manual to any US zip or Canadian postal code you select.

## Equipment Costs

**Equipment Costs** for major equipment (such as cranes and tractors) are listed in the column headed "Equipment." Costs for small tools and expendable supplies (such as saws and tape) are usually considered overhead expense and do not appear in the Equipment cost column.

Equipment costs are based on rental rates listed in the section beginning on page 320 and assume that the equipment can be used productively for an entire 8-hour day. Add the cost of moving equipment on and off the site. Allow for unproductive time when equipment can't be used for the full rental period. For example, the equipment costs per unit of work completed will be higher when a tractor is used for 4 hours during a day and sits idle for the remaining 4 hours. Generally, an 8-hour day is the minimum rental period for most heavy equipment. Many sections describe the equipment being used, the cost per hour and a suggested minimum job charge.

## Subcontracted Work

**Subcontractors** do most of the work on construction projects. That's because specialty contractors can often get the work done at competitive cost, even after adding overhead and profit.

Many sections of this book cover work usually done by subcontractors. If you see the word "subcontract" in a section description, assume that costs are based on quotes by subcontractors and include typical subcontractor markup (about 30% on labor and 15% on material). Usually no material or labor costs will appear in these sections. The only costs shown will be in the "Total" column and will include all material, labor and equipment expense.

If you don't see the word "subcontract" in a section description, assume that costs are based on work done by a general contractor's crew. No markup is included in these costs. If the work is done by a subcontractor, the specialty contractor may be able to perform the work for the cost shown, even after adding overhead and profit.

## Markup

**The General Contractor's Markup** is not included in any costs in this book. On page 208 we suggest a 20% markup on the contract price for general contractors handling residential construction. Apply this markup or some figure you select to all costs, including both subcontract items and work done by your own crews.

To realize a gross profit of 20% on the contract price, you'll have to mark up costs by 25%. See page 208 for an example of how markup is calculated. Markup includes overhead and profit and may be the most difficult item to estimate.

*National Estimator Cloud* will add to the estimate any percentage you select for overhead, contingency and profit.

## Keep In Mind

**Labor and Material Costs Change.** Costs in this manual were compiled in the fall of 2022 and projected to early 2023 based on recent price trends. These projections will be accurate for some materials but inaccurate for others. No one can predict material price changes accurately. Costs in *National Estimator Cloud*

are revised as prices change and are likely to be different from the cost in this manual.

**How Accurate Are These Figures?** As accurate as possible considering that the estimators who compiled this manual don't know your subcontractors or material suppliers, haven't seen the plans or specifications, don't know what building code applies or where the job is, tried to project material costs several months into the future, and had no record of how much work your crews can handle.

You wouldn't bid a job under those conditions. And we don't claim that all construction is done at these prices.

**Estimating Is an Art**, not a science. On many jobs, the range between high and low bid will be 20% or more. There's room for legitimate disagreement on cost estimates for any project, even when complete plans and specifications are available, the date and site are established, and labor and material costs are identical for all bidders.

No cost fits all jobs. Good estimates are custom-made for a particular project and a single contractor through judgment, analysis and experience.

This book is not a substitute for judgment, analysis and sound estimating practice. It's an aid in developing an informed opinion of cost. If you're using this book as a sole cost authority for contract bids, you're reading more into these pages than the editors intend.

**Use These Figures** to compile preliminary estimates, to check your costs and subcontract bids and when no actual costs are available. This book will reduce the chance of error or omission on bid estimates, speed "ball park" estimates, and be a good guide when there's no time to get a quote.

**Where Do We Get These Figures?** From the same sources all professional estimators use: contractors and subcontractors, architectural and engineering firms, material suppliers, material price services, analysis of plans, specifications, estimates and completed project costs, and both published and unpublished cost studies. In addition, we conduct nationwide mail and phone surveys and have the use of several major national estimating databases.

For more on using *National Estimator Cloud*, go to: <https://craftsman-book.com/support/tutorials/>



**We'll Answer Your Questions** about any part of this book and explain how to apply these costs.

Free telephone assistance is available from 8 a.m. until 5 p.m. California time Monday through Friday except holidays. Phone 760-438-7828 x 2.

We don't accept collect calls and won't estimate the job for you. But if you need clarification on something in this manual, we can help.

# Abbreviations

---

<b>AASHTO</b>	American Assn. of State Highway Officials	<b>FAA</b>	Federal Aviation Administration	<b>OC</b>	spacing from center to center
<b>ABS</b>	acrylonitrile butadiene styrene	<b>FICA</b>	Federal Insurance Contributions Act (Social Security, Medicare tax)	<b>OD</b>	outside diameter
<b>AC</b>	alternating current	<b>FOB</b>	freight on board	<b>OS &amp; Y</b>	outside screw & yoke
<b>AISC</b>	American Institute of Steel Construction Inc.	<b>FPM</b>	feet per minute	<b>oz</b>	ounce
<b>APP</b>	attactic polypropylene	<b>FRP</b>	fiberglass reinforced plastic	<b>perf</b>	perforated
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air Conditioning Engineers	<b>FS</b>	Federal Specification	<b>Pr</b>	pair
<b>ASME</b>	American Society of Mechanical Engineers	<b>ft-lbs</b>	foot pounds	<b>PSF</b>	pounds per square foot
<b>ASTM</b>	American Society for Testing Materials	<b>FUTA</b>	Federal Unemployment Compensation Act Tax	<b>PSI</b>	pounds per square inch
<b>AWPA</b>	American Wood Products Association	<b>Gal</b>	gallon	<b>PV</b>	photovoltaic
<b>AWWA</b>	American Water Works Association	<b>GFCI</b>	ground fault circuit interruptor	<b>PVC</b>	polyvinyl chloride
<b>Ba</b>	bay	<b>GPH</b>	gallon(s) per hour	<b>Qt</b>	quart
<b>Bdle</b>	bundle	<b>GPM</b>	gallon(s) per minute	<b>R</b>	thermal resistance
<b>BF</b>	board foot	<b>H</b>	height	<b>R/L</b>	random length(s)
<b>BHP</b>	boiler horsepower	<b>HP</b>	horsepower	<b>R/W/L</b>	random widths and lengths
<b>Btr</b>	better	<b>Hr(s)</b>	hour(s)	<b>RPM</b>	revolutions per minute
<b>Btu</b>	British thermal unit	<b>IMC</b>	intermediate metal conduit	<b>RSC</b>	rigid steel conduit
<b>B &amp; W</b>	black & white	<b>ID</b>	Inside diameter	<b>S1S2E</b>	surfaced 1 side, 2 edges
<b>C</b>	thermal conductance	<b>KD</b>	kiln dried or knocked down	<b>S2S</b>	surfaced 2 sides
<b>C</b>	one hundred	<b>KSI</b>	kips per square inch	<b>S4S</b>	surfaced 4 sides
<b>CF</b>	cubic foot	<b>KV</b>	kilovolt(s)	<b>Sa</b>	sack
<b>CFM</b>	cubic feet per minute	<b>KVA</b>	1,000 volt amps	<b>SBS</b>	styrene butyl styrene
<b>CLF</b>	100 linear feet	<b>kw</b>	kilowatt(s)	<b>SDR</b>	size to diameter ratio
<b>cm</b>	centimeter	<b>kwh</b>	kilowatt hour	<b>SF</b>	square foot
<b>CPE</b>	chlorinated polyethylene	<b>L</b>	length	<b>SFCA</b>	square feet of form in contact with concrete
<b>CPM</b>	cycles per minute	<b>Lb(s)</b>	pound(s)	<b>Sq</b>	100 square feet
<b>CPVC</b>	chlorinated polyvinyl chloride	<b>LF</b>	linear foot	<b>SSB</b>	single strength B
<b>CSPE</b>	chloro sulfinated polyethylene	<b>LP</b>	liquefied propane	<b>STC</b>	quality glass
<b>CSF</b>	100 square feet	<b>LS</b>	lump sum	<b>Std</b>	sound transmission class
<b>CSY</b>	100 square yards	<b>M</b>	one thousand	<b>SY</b>	standard
<b>CY</b>	cubic yard	<b>Mb</b>	million bytes (characters)	<b>T</b>	square yard
<b>d</b>	penny	<b>MBF</b>	1,000 board feet	<b>T&amp;G</b>	thick
<b>D</b>	depth	<b>MBtu</b>	1,000 British thermal units	<b>TV</b>	tongue & groove edge
<b>DC</b>	direct current	<b>MCM</b>	1,000 circular mils	<b>UBC</b>	television
<b>dia</b>	diameter	<b>MDO</b>	medium density overlaid	<b>UL</b>	Uniform Building Code
<b>DSB</b>	double strength B quality glass	<b>MH</b>	manhour	<b>USDA</b>	Underwriter's Laboratory
<b>DWV</b>	drain, waste, vent piping	<b>Mi</b>	mile	<b>VLF</b>	United States Dept.
<b>Ea</b>	each	<b>MLF</b>	1,000 linear feet	<b>W</b>	of Agriculture
<b>EMT</b>	electric metallic tube	<b>MPH</b>	miles per hour	<b>Wk</b>	vertical linear foot
<b>EPDM</b>	ethylene propylene diene monomer	<b>mm</b>	millimeter(s)	<b>W/</b>	width
<b>equip.</b>	equipment	<b>Mo</b>	month	<b>x</b>	week
<b>exp.</b>	exposure	<b>MSF</b>	1,000 square feet		with
<b>F</b>	Fahrenheit	<b>NEMA</b>	National Electrical Manufacturer's Association		by or times
		<b>NFPA</b>	National Fire Protection Association		
		<b>No.</b>	number		
		<b>NRC</b>	noise reduction coefficient		

## Symbols

---

/	per
—	through or to
@	at
%	per 100 or percent
\$	U.S. dollars
'	feet
"	inches
#	pound or number

# Craft Codes, Hourly Costs and Crew Compositions

Both the Residential Division and Commercial and Industrial Division of this book include a column titled Craft@Hrs. Letters and numbers in this column show our estimates of:

- Who will do the work (the craft code)
- An @ symbol which means at
- How long the work will take (manhours).

For example, on page 51 you'll find estimates for installing BC plywood wall sheathing by the square foot. The Craft@Hrs column opposite  $\frac{1}{2}$ " plywood wall sheathing shows:

B1 @ .016

That means we estimate the installation rate for crew B1 at .016 manhours per square foot. That's the same as 16 manhours per 1,000 square feet.

The table that follows defines each of the craft codes used in this book. Notice that crew B1 is com-

posed of two craftsmen: one laborer and one carpenter. To install 1,000 square feet of  $\frac{1}{2}$ " BC wall sheathing at .016 manhours per square foot, that crew would need 16 manhours (one 8-hour day for a crew of two).

Notice also in the table below that the cost per manhour for crew B1 is listed as \$35.69. That's the average for a residential laborer (listed at \$31.97 per hour on page 10) and a residential carpenter (listed at \$39.40 per hour); \$31.97 plus \$39.40 is \$71.37. Divide by 2 to get \$35.685 (rounded up to \$35.69), the average cost per manhour for crew B1.

In the table below, the cost per manhour is the sum of hourly costs of all crew members divided by the number of crew members. That's the average cost per manhour.

Costs in the Labor column in this book are the installation time (in manhours) multiplied by the cost per manhour.

## Residential Division

Craft Code	Cost Per Manhour	Crew Composition
B1	\$35.69	1 laborer and 1 carpenter
B2	\$36.92	1 laborer, 2 carpenters
B3	\$34.45	2 laborers, 1 carpenter
B4	\$39.60	1 laborer 1 operating engineer 1 reinforcing iron worker
B5	\$39.17	1 laborer, 1 carpenter 1 cement mason 1 operating engineer 1 reinforcing iron worker
B6	\$34.81	1 laborer, 1 cement mason
B7	\$32.63	1 laborer, 1 truck driver
B8	\$38.57	1 laborer 1 operating engineer
B9	\$35.02	1 bricklayer 1 bricklayer's helper
BB	\$40.19	1 bricklayer
BC	\$39.40	1 carpenter
BE	\$43.09	1 electrician
BF	\$36.40	1 floor layer
BG	\$38.20	1 glazier
BH	\$29.85	1 bricklayer's helper
BL	\$31.97	1 laborer

Craft Code	Cost Per Manhour	Crew Composition
BR	\$38.17	1 lather
BS	\$35.38	1 marble setter
CF	\$37.65	1 cement mason
CT	\$37.47	1 mosaic & terrazzo worker
D1	\$38.88	1 drywall installer 1 drywall taper
DI	\$38.64	1 drywall installer
DT	\$39.12	1 drywall taper
HC	\$31.08	1 plasterer helper
OE	\$45.16	1 operating engineer
P1	\$39.03	1 laborer, 1 plumber
PM	\$46.09	1 plumber
PP	\$36.02	1 painter, 1 laborer
PR	\$39.59	1 plasterer
PT	\$40.43	1 painter
R1	\$37.85	1 roofer, 1 laborer
RI	\$41.66	1 reinforcing iron worker
RR	\$43.73	1 roofer
SW	\$44.66	1 sheet metal worker
T1	\$34.95	1 tile layer, 1 laborer
TL	\$37.92	1 tile layer
TR	\$33.29	1 truck driver

**Commercial and Industrial Division**

<b>Craft Code</b>	<b>Cost Per Manhour</b>	<b>Crew Composition</b>	<b>Craft Code</b>	<b>Cost Per Manhour</b>	<b>Crew Composition</b>
A1	\$54.03	1 asbestos worker 1 laborer	F6	\$52.07	2 carpenters, 2 laborers 1 tractor operator
AT	\$46.63	1 air tool operator	F7	\$54.16	2 carpenters, 1 laborer 1 tractor operator
AW	\$64.33	1 asbestos worker	F8	\$54.82	2 plasterers 1 plasterer's helper
BM	\$65.26	1 boilermaker	F9	\$49.15	1 laborer, 1 floor layer
BT	\$43.98	1 bricklayer tender	FL	\$54.56	1 floor layer
C1	\$44.84	4 laborers, 1 truck driver	G1	\$51.28	1 glazier, 1 laborer
C2	\$52.69	1 laborer, 2 truck drivers 2 tractor operators	H1	\$57.54	1 carpenter, 1 laborer 1 iron worker (structural) 1 tractor operator
C3	\$51.20	1 laborer, 1 truck driver 1 tractor operator	H2	\$55.04	1 crane operator 1 truck driver
C4	\$45.58	2 laborers, 1 truck driver	H3	\$49.57	1 carpenter, 3 laborers 1 crane operator 1 truck driver
C5	\$49.33	2 laborers, 1 truck driver 1 tractor operator	H4	\$66.03	1 crane operator 6 iron workers (structural) 1 truck driver
C6	\$48.21	6 laborers, 2 truck drivers 2 tractor operators	H5	\$57.53	1 crane operator 2 iron workers (structural) 2 laborers
C7	\$50.95	2 laborers , 3 truck drivers 1 crane operator 1 tractor operator	H6	\$56.72	1 iron worker (structural) 1 laborer
C8	\$49.95	1 laborer, 1 carpenter	H7	\$66.73	1 crane operator 2 iron workers (structural)
C9	\$52.26	1 laborer, 1 crane operator	H8	\$64.81	1 crane operator 4 iron workers (structural) 1 truck driver
CB	\$57.32	1 bricklayer	H9	\$64.27	1 electrician 1 sheet metal worker
CC	\$56.16	1 carpenter	IW	\$69.70	1 iron worker (structural)
CD	\$55.54	1 drywall Installer	LA	\$50.90	1 lather
CE	\$64.09	1 electrician	M1	\$50.65	1 bricklayer 1 bricklayer's tender
CG	\$58.82	1 glazier	M2	\$47.87	1 carpenter, 2 laborers
CL	\$43.73	1 laborer	M3	\$53.12	1 plasterer 1 plasterer's helper
CM	\$54.41	1 cement mason	M4	\$50.68	1 laborer, 1 marble setter
CO	\$60.78	1 crane operator	M5	\$55.02	1 pipefitter, 1 laborer,
CV	\$60.81	1 elevator constructor	M6	\$58.12	1 asbestos worker 1 laborer, 1 pipefitter
D2	\$49.64	1 drywall installer 1 laborer	M8	\$60.66	3 pipefitters, 1 laborer
D3	\$56.84	1 laborer, 1 iron worker (structural), 1 millwright	M9	\$65.02	1 electrician, 1 pipefitter
D4	\$50.41	1 laborer, 1 millwright	MI	\$58.78	2 pipefitters, 1 laborer
D5	\$54.50	1 boilermaker, 1 laborer	MS	\$57.63	marble setter
D6	\$58.24	2 millwrights 1 tractor operator	MT	\$54.18	mosaic & terrazzo worker
D7	\$50.09	1 painter, 1 laborer	MW	\$57.08	millwright
D9	\$52.63	2 millwrights, 1 laborer			
E1	\$55.24	2 electricians, 2 laborers 1 tractor operator			
E2	\$53.91	2 electricians, 2 laborers			
E3	\$54.66	2 electricians, 2 laborers 2 carpenters			
E4	\$53.91	1 electrician, 1 laborer			
F5	\$51.19	3 carpenters, 2 laborers			

**Commercial and Industrial Division**

<b>Craft Code</b>	<b>Cost Per Manhour</b>	<b>Crew Composition</b>	<b>Craft Code</b>	<b>Cost Per Manhour</b>	<b>Crew Composition</b>
P5	\$48.21	3 laborers 1 tractor operator 1 truck driver	S8	\$54.13	2 pile drivers, 2 laborers 1 truck driver 1 crane operator 1 tractor operator
P6	\$55.58	1 laborer, 1 plumber	S9	\$51.54	1 pile driver, 2 laborers 1 tractor operator 1 truck driver
P8	\$49.07	1 laborer, 1 cement mason	SM	\$64.44	1 sheet metal worker
P9	\$51.43	1 carpenter, 1 laborer 1 cement mason	SP	\$68.83	1 sprinkler fitter
PA	\$56.44	1 painter	SS	\$54.96	1 laborer 2 tractor operators
PD	\$60.93	1 pile driver	T2	\$56.26	3 laborers, 3 carpenters 3 iron workers (structural) 1 crane operator 1 truck driver
PF	\$66.30	1 pipefitter	T3	\$56.40	1 laborer 1 reinforcing iron worker
PH	\$48.02	1 plasterer's helper	T4	\$48.96	1 laborer, 1 mosaic worker
PL	\$67.43	1 plumber	T5	\$54.09	1 sheet metal worker 1 laborer
PS	\$58.22	1 plasterer	T6	\$57.54	2 sheet metal workers 1 laborer
R3	\$49.50	2 roofers, 1 laborer	TD	\$49.29	1 truck driver
RB	\$69.06	1 reinforcing iron worker	TO	\$60.57	1 tractor operator
RF	\$52.38	1 roofer	U1	\$53.87	1 plumber, 2 laborers 1 tractor operator
S1	\$52.15	1 laborer 1 tractor operator	U2	\$51.63	1 plumber, 2 laborers
S3	\$54.93	1 truck driver 1 tractor operator			
S4	\$43.73	3 laborers			
S5	\$46.96	5 laborers 1 crane operator 1 truck driver			
S6	\$49.34	2 laborers 1 tractor operator			
S7	\$52.12	3 laborers 3 tractor operators			

# Residential Division

Craft	1 Base wage per hour	2 Taxable fringe benefits (@5.61% of base wage)	3 Insurance and employer taxes (%)	4 Insurance and employer taxes (\$)	5 Non-taxable fringe benefits (@4.96% of base wage)	6 Total hourly cost used in this book
Bricklayer	\$29.51	\$1.66	24.27%	\$7.56	\$1.46	\$40.19
Bricklayer's Helper	21.91	1.23	24.27	5.62	1.09	29.85
Building Laborer	22.31	1.25	30.97	7.30	1.11	31.97
Carpenter	27.72	1.56	29.87	8.75	1.37	39.40
Cement Mason	28.04	1.57	22.46	6.65	1.39	37.65
Drywall installer	28.74	1.61	22.65	6.87	1.42	38.64
Drywall Taper	29.09	1.63	22.65	6.96	1.44	39.12
Electrician	32.89	1.85	19.34	6.72	1.63	43.09
Floor Layer	26.99	1.51	23.01	6.56	1.34	36.40
Glazier	27.97	1.57	24.62	7.27	1.39	38.20
Lather	28.83	1.62	20.67	6.29	1.43	38.17
Marble Setter	26.71	1.50	20.74	5.85	1.32	35.38
Millwright	28.20	1.58	20.64	6.15	1.40	37.33
Mosaic & Terrazzo Worker	28.28	1.59	20.74	6.20	1.40	37.47
Operating Engineer	33.18	1.86	24.19	8.48	1.64	45.16
Painter	29.75	1.67	24.01	7.54	1.47	40.43
Plasterer	28.43	1.60	27.15	8.15	1.41	39.59
Plasterer Helper	22.32	1.25	27.15	6.40	1.11	31.08
Plumber	34.02	1.91	23.57	8.47	1.69	46.09
Reinforcing Ironworker	29.88	1.68	27.31	8.62	1.48	41.66
Roofer	28.40	1.59	41.11	12.33	1.41	43.73
Sheet Metal Worker	32.61	1.83	24.97	8.60	1.62	44.66
Sprinkler Fitter	33.43	1.88	24.22	8.55	1.66	45.52
Tile Layer	28.62	1.61	20.74	6.27	1.42	37.92
Truck Driver	24.27	1.36	25.19	6.46	1.20	33.29

## Hourly Labor Cost

The labor costs shown in Column 6 were used to compute the manhour costs for crews on page 7 and the figures in the "Labor" column of the Residential Division of this manual. Figures in the "Labor" column of the Industrial and Commercial Division of this book were computed using the hourly costs shown on page 309. All labor costs are in U.S. dollars per manhour.

It's important that you understand what's included in the figures in each of the six columns above. Here's an explanation:

**Column 1**, the base wage per hour, is the craftsman's hourly wage. These figures are representative of

what many contractors will be paying craftsmen working on residential construction in 2023.

**Column 2**, taxable fringe benefits, includes vacation pay, sick leave and other taxable benefits. These fringe benefits average 5.61% of the base wage for many construction contractors. This benefit is in addition to the base wage.

**Column 3**, insurance and employer taxes in percent, shows the insurance and tax rate for construction trades. The cost of insurance in this column includes workers' compensation and contractor's casualty and liability coverage. Insurance rates vary widely from state to state and depend on a contractor's loss experience. Typical rates are shown in the Insurance section

of this manual beginning on page 185. Taxes are itemized in the section on page 285. Note that taxes and insurance increase the hourly labor cost by 30 to 35% for most trades. There is no legal way to avoid these costs.

**Column 4**, insurance and employer taxes in dollars, shows the hourly cost of taxes and insurance for each construction trade. Insurance and taxes are paid on the costs in both columns 1 and 2.

**Column 5**, non-taxable fringe benefits, includes employer paid non-taxable benefits such as medical coverage and tax-deferred pension and profit sharing plans. These fringe benefits average 4.96% of the base wage for many construction contractors. The employer pays no taxes or insurance on these benefits.

**Column 6**, the total hourly cost in dollars, is the sum of columns 1, 2, 4, and 5.

These hourly labor costs will apply within a few percent on many jobs. But wage rates may be much higher or lower in some areas. If the hourly costs shown in column 6 are not accurate for your work, develop modification factors that you can apply to the labor costs in this book. The following paragraphs explain the procedure.

## Adjusting Labor Costs

Here's how to customize the labor costs in this book if your wage rates are different from the wage rates shown on page 10 or 309.

Start with the taxable benefits you offer. Assume craftsmen on your payroll get one week of vacation each year and one week of sick leave each year. Convert these benefits into hours. Your computation might look like this:

$$\begin{array}{r} 40 \text{ vacation hours} \\ + 40 \text{ sick leave hours} \\ \hline 80 \text{ taxable leave hours} \end{array}$$

Then add the regular work hours for the year:

$$\begin{array}{r} 2,000 \text{ regular hours} \\ + 80 \text{ taxable benefit hours} \\ \hline 2,080 \text{ total hours} \end{array}$$

Multiply these hours by the base wage per hour. If you pay carpenters \$20.00 per hour, the calculation would be:

$$\begin{array}{r} 2,080 \text{ hours} \\ \times \$20.00 \text{ per hour} \\ \hline \$41,600 \text{ per year} \end{array}$$

Next, determine the tax and insurance rate for each trade. If you know the rates that apply to your jobs, use those rates. If not, use the rates in column 3 on page 10.

Continuing with our example, we'll use 29.87%, the rate for carpenters in column 3 on page 10. To increase the annual taxable wage by 29.87%, we'll multiply by 1.2987:

$$\begin{array}{r} \$41,600 \text{ per year} \\ \times 1.2987 \text{ tax & insurance rate} \\ \hline \$54,026 \text{ annual cost} \end{array}$$

Then add the cost of non-taxable benefits. Suppose your company has no pension or profit sharing plan but does provide medical insurance for employees. Assume that the cost for your carpenter is \$343.67 per month or \$4,124 per year.

$$\begin{array}{r} \$4,124 \text{ medical plan} \\ + 54,026 \text{ annual cost} \\ \hline \$58,150 \text{ total annual cost} \end{array}$$

Divide this total annual cost by the actual hours worked in a year. This gives the contractor's total hourly labor cost including all benefits, taxes and insurance. Assume your carpenter will work 2,000 hours a year:

$$\frac{\$58,150}{2,000} = \$29.07 \text{ per hour}$$

Finally, find your modification factor for the labor costs in this book. Divide your total hourly labor cost by the total hourly labor cost shown on page 10. For the carpenter in our example, the figure in column 6 is \$39.40.

$$\frac{\$29.07}{\$39.40} = .738$$

Your modification factor is 73.8%. Multiply any building carpenter (Craft Code BC) labor costs in the Residential Division of this book by .738 to find your estimated cost. For example, on page 24 the labor cost for installing an 18" long towel bar is \$11.00 per each bar. If installed by your carpenter working at \$20.00 per hour, your estimated cost would be 73.8% of \$11.00 or \$8.12. The manhours would remain the same @.280, assuming normal productivity.

## If the Labor Rate Is Unknown

On some estimates you may not know what labor rates will apply. In that case, use both labor and material figures in this book without making any adjustment. When all labor, equipment and material costs have been compiled, add or deduct the percentage shown in the area modification table on pages 12 through 15.

Adjusting the labor costs in this book will make your estimates much more accurate.

# Area Modification Factors

Construction costs are higher in some areas than in other areas. Add or deduct the percentage shown on the following pages to adapt the costs in this book to your job site. Adjust your cost estimate up or down by the 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 alphabetically. For convenience, one representative city is identified in each three-digit zip or range of zips. Percentages are based on the average of all data points in the table. Factors listed for each state and province are the average of all data points in that

state or province. Figures for three-digit zips are the average of all five-digit zips in that area. Figures in the Total column are the weighted average of factors for Labor, Material and Equipment.

National Estimator Cloud will apply an area modification factor for any five-digit zip or Canadian postal code you select.

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, these area cost modifiers should improve the accuracy of your estimates.

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.												
<b>Alabama Average</b>																													
Anniston	362	-3	-12	-1	-7%	Long Beach	907-908	3	20	1	11%	Washington	200-205	2	21	1	11%												
Auburn	368	-1	-7	0	-4%	Los Angeles	900-901	3	14	1	8%	Florida Average	0	-7	0	-3%													
Bellamy	369	-2	-5	-1	-3%	Marysville	959	1	2	0	1%	Altamonte Springs	327	-1	-3	0	-2%												
Birmingham	350-352	-3	12	-1	4%	Modesto	953	1	3	0	2%	Bradenton	342	0	-11	0	-5%												
Dothan	363	-1	-5	0	-3%	Mojave	935	0	11	0	5%	Brooksville	346	0	-11	0	-5%												
Evergreen	364	-2	-7	-1	-4%	Novato	949	3	29	1	15%	Daytona Beach	321	-2	-17	-1	-9%												
Gadsden	359	-4	-10	-1	-7%	Oakland	945-947	3	39	1	20%	Fort Lauderdale	333	3	3	1	3%												
Huntsville	358	1	13	0	7%	Orange	928	3	26	1	14%	Fort Myers	339	0	-11	0	-5%												
Jasper	355	-2	-19	-1	-10%	Oxnard	930	3	6	1	4%	Fort Pierce	349	-2	-13	-1	-7%												
Mobile	365-366	-1	-4	0	-2%	Pasadena	910-912	4	16	1	9%	Gainesville	326	-1	-14	0	-7%												
Montgomery	360-361	-1	0	0	-1%	Rancho Cordova	956-957	2	21	1	11%	Jacksonville	322	-1	0	0	-1%												
Scottsboro	357	0	5	0	2%	Redding	960	1	4	0	2%	Lakeland	338	-3	-12	-1	-7%												
Selma	367	-1	-8	0	-4%	Richmond	948	2	46	1	22%	Melbourne	329	-2	-10	-1	-6%												
Sheffield	356	-1	-1	0	-1%	Riverside	925	1	7	0	4%	Miami	330-332	2	4	1	3%												
Tuscaloosa	354	0	-8	0	-4%	Sacramento	958	1	23	0	11%	Naples	341	3	-7	1	-2%												
<b>Alaska Average</b>																													
Anchorage	995	16	20	5	18%	San Bernardino	923-924	0	7	0	3%	Ocala	344	-3	-18	-1	-10%												
Fairbanks	997	16	24	5	20%	San Diego	919-921	3	12	1	7%	Orlando	328	0	1	0	0%												
Juneau	998	18	8	6	13%	San Francisco	941	3	69	1	33%	Panama City	324	-2	-14	-1	-8%												
Ketchikan	999	3	7	1	5%	San Jose	950-951	3	45	1	22%	Pensacola	325	-1	-13	0	-7%												
King Salmon	996	16	14	5	15%	San Mateo	943-944	4	53	1	26%	Saint Augustine	320	-1	-4	0	-2%												
<b>Arizona Average</b>																													
Chambers	865	1	-30	0	-13%	Santa Barbara	931	3	4	1	3%	Saint Cloud	347	0	-4	0	-2%												
Douglas	855	0	-20	0	-9%	Stockton	952	2	14	1	8%	St Petersburg	337	0	-4	0	-2%												
Flagstaff	860	2	-19	1	-8%	Sunnyvale	940	3	52	1	26%	Tallahassee	323	0	-7	0	-3%												
Kingman	864	1	-10	0	-4%	Van Nuys	913-916	3	14	1	8%	Tampa	335-336	-1	1	0	0%												
Mesa	852	1	11	0	6%	Whittier	906	3	16	1	9%	West Palm Beach	334	1	5	0	3%												
Phoenix	850	1	11	0	6%	<b>Colorado Average</b>																							
Prescott	863	3	-14	1	-5%	Aurora	800-801	3	19	1	10%	Georgia Average	-1	2	0	0	0%												
Show Low	859	2	-20	1	-8%	Boulder	803-804	3	12	1	7%	Albany	317	-2	-11	-1	-6%												
Tucson	856-857	0	9	0	-4%	Colorado Springs	808-809	2	2	1	2%	Athens	306	0	0	0	0%												
Yuma	853	0	10	0	5%	Denver	802	3	23	1	12%	Atlanta	303	3	40	1	20%												
<b>Arkansas Average</b>																													
Batesville	725	0	-19	0	-9%	Durango	813	1	-12	0	-5%	Augusta	308-309	-2	2	-1	0%												
Camden	717	-4	-13	-1	-8%	Fort Morgan	807	2	-4	1	-1%	Buford	305	0	-2	0	-1%												
Fayetteville	727	0	-9	0	-4%	Glenwood Springs	816	2	7	1	4%	Calhoun	307	-1	0	0	-1%												
Fort Smith	729	-1	-15	0	-7%	Grand Junction	814-815	1	-10	0	-4%	Columbus	318-319	-1	-5	0	-3%												
Harrison	726	-1	-28	0	-13%	Greeley	806	3	12	1	7%	Dublin/Fort Valley	310	-3	-13	-1	-8%												
Hope	718	-3	-17	-1	-9%	Longmont	805	3	6	1	4%	Hinesville	313	-2	8	-1	3%												
Hot Springs	719	-2	-27	-1	-13%	Pagosa Springs	811	0	-11	0	-5%	Kings Bay	315	-2	-19	-1	-10%												
Jonesboro	724	-1	-6	0	-3%	Pueblo	810	-1	-6	0	-3%	Macon	312	-2	6	-1	2%												
Little Rock	720-722	-1	-4	0	-2%	Salida	812	2	-8	1	-3%	Marietta	300-302	1	13	0	7%												
Pine Bluff	716	-4	-23	-1	-13%	<b>Connecticut Average</b>																							
Russellville	728	0	3	0	1%	Bridgeport	066	0	18	0	8%	Savannah	314	-1	-3	0	-2%												
West Memphis	723	-3	-12	-1	-7%	Bristol	060	1	22	0	11%	Statesboro	304	-2	14	-1	5%												
<b>California Average</b>																													
Alhambra	917-918	3	17	1	9%	Fairfield	064	2	19	1	10%	Valdosta	316	-1	-6	0	-3%												
Bakersfield	932-933	0	-2	0	-1%	Hartford	061	0	20	0	9%	<b>Hawaii Average</b>																	
El Centro	922	1	-2	0	0%	New Haven	065	1	14	0	7%	Aliamanu	968	17	25	6	21%												
Eureka	955	1	-6	0	-2%	Norwich	063	0	8	0	4%	Ewa	967	17	19	6	18%												
Fresno	936-938	0	-3	0	-1%	Stamford	068-069	4	25	1	14%	Halawa Heights	967	17	19	6	18%												
Herlong	961	2	-1	1	1%	Waterbury	067	1	13	0	7%	Hilo	967	17	19	6	18%												
Inglewood	902-905	3	16	1	9%	West Hartford	062	1	6	0	3%	Honolulu	968	17	25	6	21%												
Irvine	926-927	3	29	1	15%	<b>Delaware Average</b>																							
Lompoc	934	3	11	1	7%	Dover	199	1	-2	0	0%	Kailua	968	17	25	6	21%												
Wilmington	198	0	10	0	5%	Newark	197	2	11	1	6%	Lualualei	967	17	19	6	18%												
						Waianae	196	17	19	1	6%	Millanai Town	967	17	19	6	18%												
						Pearl City	967	17	19	6	18%	Waipahu	967	17	19	6	18%												
						Wahiaawa	967	17	19	6	18%	Waianae	967	17	19	6	18%												
						Wailuku (Maui)	967	17	19	6	18%	Wailuku (Maui)	967	17	19	6	18%												

# Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
<b>Idaho Average</b>		<b>0</b>	<b>-17</b>	<b>0</b>	<b>-8%</b>
Boise	837	1	-2	0	0%
Coeur d'Alene	838	0	-14	0	-6%
Idaho Falls	834	-1	-19	0	-9%
Lewiston	835	0	-28	0	-13%
Meridian	836	0	-14	0	-6%
Pocatello	832	-1	-21	0	-10%
Sun Valley	833	0	-18	0	-8%
<b>Illinois Average</b>		<b>-1</b>	<b>8</b>	<b>0</b>	<b>4%</b>
Arlington Heights	600	1	25	0	12%
Aurora	605	2	28	1	14%
Belleville	622	-2	10	-1	4%
Bloomington	617	1	-2	0	0%
Carbondale	629	-3	-14	-1	-8%
Carol Stream	601	2	26	1	13%
Centralia	628	-3	-10	-1	-6%
Champaign	618	-1	-3	0	-2%
Chicago	606-608	2	26	1	13%
Decatur	623	-2	-7	-1	-4%
Galesburg	614	-2	-7	-1	-4%
Granite City	620	-3	5	-1	1%
Green River	612	-1	2	0	0%
Joliet	604	0	25	0	12%
Kankakee	609	-2	2	-1	0%
Lawrenceville	624	-4	0	-1	-2%
Oak Park	603	3	29	1	15%
Peoria	615-616	-1	19	0	8%
Peru	613	0	7	0	3%
Quincy	602	3	25	1	13%
Rockford	610-611	-2	12	-1	4%
Springfield	625-627	-2	0	-1	-1%
Urbana	619	-3	-3	-1	-3%
<b>Indiana Average</b>		<b>-2</b>	<b>-5</b>	<b>-1</b>	<b>-4%</b>
Aurora	470	-1	-15	0	-7%
Bloomington	474	1	-10	0	-4%
Columbus	472	0	-5	0	-2%
Elkhart	465	-2	-5	-1	-3%
Evansville	476-477	-2	-3	-1	-2%
Fort Wayne	467-468	-3	0	-1	-2%
Gary	463-464	-4	16	-1	5%
Indianapolis	460-462	-1	11	0	5%
Jasper	475	-2	-13	-1	-7%
Jeffersonville	471	-1	-10	0	-5%
Kokomo	469	-2	-14	-1	-8%
Lafayette	479	-2	-2	-1	-2%
Muncie	473	-4	-16	-1	-9%
South Bend	466	-4	-5	-1	-4%
Terre Haute	478	-4	-8	-1	-6%
<b>Iowa Average</b>		<b>-2</b>	<b>-5</b>	<b>-1</b>	<b>-3%</b>
Burlington	526	0	-8	0	-4%
Carroll	514	-3	-10	-1	-6%
Cedar Falls	506	-1	-4	0	-2%
Cedar Rapids	522-524	0	5	0	2%
Cherokee	510	-2	1	-1	-1%
Council Bluffs	515	-2	-6	-1	-4%
Creston	508	-3	-6	-1	-4%
Davenport	527-528	-1	1	0	0%
Decorah	521	-2	-10	-1	-6%
Des Moines	500-503	-2	9	-1	3%
Dubuque	520	-2	-1	-1	-2%
Fort Dodge	505	-2	-1	-1	-2%
Mason City	504	0	-7	0	-3%
Ottumwa	525	0	-22	0	-10%
Sheldon	512	-1	-1	0	-1%
Shenandoah	516	-3	-23	-1	-12%
Sioux City	511	-2	3	-1	0%
Spencer	513	-1	-5	0	-3%
Waterloo	507	-4	-4	-1	-4%
<b>Kansas Average</b>		<b>-2</b>	<b>-13</b>	<b>-1</b>	<b>-7%</b>
Colby	677	-1	-10	0	-5%
Concordia	669	-1	-31	0	-15%
Dodge City	678	-2	-12	-1	-7%
Emporia	668	-3	-20	-1	-11%
Fort Scott	667	-2	-9	-1	-5%
Hays	676	-2	-22	-1	-11%
<b>Hutchinson</b>		<b>675</b>	<b>-3</b>	<b>-14</b>	<b>-1</b>
Independence	673	-3	-1	-1	-2%
Kansas City	660-662	0	8	0	4%
Liberal	679	-2	-22	-1	-11%
Salina	674	-3	-15	-1	-8%
Topeka	664-666	-3	-7	-1	-5%
Wichita	670-672	-2	-8	-1	-5%
<b>Kentucky Average</b>		<b>-1</b>	<b>-12</b>	<b>0</b>	<b>-6%</b>
Ashland	411-412	-4	-6	-1	-5%
Bowling Green	421	0	-9	0	-4%
Campton	413-414	-1	-28	0	-13%
Covington	410	-1	9	0	4%
Elizabethtown	427	-1	-13	0	-7%
Frankfort	406	1	-18	0	-8%
Hazard	417-418	-2	-27	-1	-13%
Hopkinsville	422	-2	-9	-1	-5%
Lexington	403-405	1	4	0	2%
London	407-409	-1	-24	0	-12%
Louisville	400-402	-1	1	0	0%
Owensboro	423	-2	-16	-1	-8%
Paducah	420	-2	-12	-1	-7%
Pikeville	415-416	-3	-20	-1	-11%
Somerset	425-426	0	-22	0	-10%
White Plains	424	-3	-4	-1	-3%
<b>Louisiana Average</b>		<b>-1</b>	<b>4</b>	<b>-1</b>	<b>1%</b>
Alexandria	713-714	-3	-13	-1	-8%
Baton Rouge	707-708	0	29	0	13%
Houma	703	-2	18	-1	7%
Lafayette	705	0	9	0	4%
Lake Charles	706	-2	19	-1	8%
Mandeville	704	-1	14	0	6%
Minden	710	-2	-16	-1	-8%
Monroe	712	-2	-18	-1	-9%
New Orleans	700-701	0	14	0	6%
Shreveport	711	-2	-12	-1	-7%
<b>Maine Average</b>		<b>0</b>	<b>-10</b>	<b>0</b>	<b>-5%</b>
Auburn	042	-1	-9	0	-5%
Augusta	043	-1	-9	0	-5%
Bangor	044	-1	-4	0	-2%
Bath	045	1	-13	0	-5%
Brunswick	039-040	1	0	0	1%
Camden	048	-1	-18	0	-9%
Cutter	046	-1	-21	0	-10%
Dexter	049	-1	-12	0	-6%
Northern Area	047	-2	-16	-1	-8%
Portland	041	2	5	1	3%
<b>Maryland Average</b>		<b>1</b>	<b>5</b>	<b>0</b>	<b>3%</b>
Annapolis	214	4	14	1	9%
Baltimore	210-212	-1	14	0	6%
Bethesda	208-209	3	24	1	13%
Church Hill	216	2	-9	1	-3%
Cumberland	215	-4	-15	-1	-9%
Elkton	219	2	6	1	4%
Frederick	217	1	9	0	5%
Laurel	206-207	2	15	1	8%
Salisbury	218	1	-14	0	-6%
<b>Massachusetts Average</b>		<b>2</b>	<b>24</b>	<b>1</b>	<b>12%</b>
Ayer	015-016	1	15	0	7%
Bedford	017	3	39	1	20%
Boston	021-022	3	55	1	27%
Brockton	023-024	3	41	1	20%
Cape Cod	026	2	10	1	6%
Chicopee	010	1	9	0	5%
Dedham	019	2	30	1	15%
Fitchburg	014	2	28	1	14%
Hingham	020	3	39	1	20%
Lawrence	018	2	36	1	18%
Nantucket	025	3	22	1	12%
New Bedford	027	1	19	0	9%
Northfield	013	2	6	1	4%
Pittsfield	012	1	-4	0	-1%
Springfield	011	-1	8	0	3%
<b>Montana Average</b>		<b>0</b>	<b>-5</b>	<b>0</b>	<b>-2%</b>
Billings	590-591	0	1	0	0%
Butte	597	1	3	0	2%
Fairview	592	-1	8	0	3%
Great Falls	594	-1	1	0	0%
Havre	595	-1	-14	0	-7%
Helena	596	0	-7	0	-3%
Kalispell	599	1	-12	0	-5%
Miles City	593	-1	-14	0	-7%
Missoula	598	1	-11	0	-5%
<b>Nebraska Average</b>		<b>-1</b>	<b>-15</b>	<b>0</b>	<b>-7%</b>
Alliance	693	-1	-27	0	-13%
Columbus	686	-1	-10	0	-5%
Grand Island	688	0	-18	0	-8%
Hastings	689	0	-10	0	-5%
Lincoln	683-685	0	-9	0	-4%

# Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
McCook	690	1	-20	0	-9%	Rochester	144-146	-3	5	-1	1%	Grants Pass	975	2	-12	1	-4%
Norfolk	687	-3	-10	-1	-6%	Rockaway	116	3	16	1	9%	Klamath Falls	976	2	-19	1	-8%
North Platte	691	0	-19	0	-9%	Rome	133-134	-3	-6	-1	-4%	Pendleton	978	0	-7	0	-3%
Omaha	680-681	-1	1	0	0%	Staten Island	103	3	16	1	9%	Portland	970-972	2	22	1	11%
Valentine	692	-2	-25	-1	-13%	Stewart	127	-1	27	0	12%	Salem	973	2	-4	1	-1%
<b>Nevada Average</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1%</b>	Syracuse	130-132	-3	7	-1	2%	<b>Pennsylvania Average</b>	<b>-3</b>	<b>-2</b>	<b>-1</b>	<b>-2%</b>	
Carson City	897	2	-10	1	-4%	Rochester	141	-4	1	-1	-2%	Allentown	181	-2	7	-1	2%
Elko	898	1	2	0	1%	Rockaway	135	-4	-6	-1	-5%	Altoona	166	-3	-16	-1	-9%
Ely	893	2	-11	1	-4%	Rome	136	-2	-7	-1	-4%	Beaver Springs	178	-3	-12	-1	-7%
Fallon	894	2	7	1	4%	Staten Island	109	1	8	0	4%	Bethlehem	180	-1	15	0	6%
Las Vegas	889-891	2	4	1	3%	Stewart	127	-1	27	0	12%	Bradford	167	-4	-18	-1	-10%
Reno	895	2	7	1	4%	Syracuse	130-132	-3	7	-1	2%	Butler	160	-4	3	-1	-1%
<b>New Hampshire Average</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>2%</b>	Rochester	141	-4	1	-1	-2%	Chambersburg	172	-1	-11	0	-6%	
Charlestown	036	0	-8	0	-4%	Rockaway	135	-4	-6	-1	-5%	Clearfield	168	2	7	1	4%
Concord	034	1	0	0	1%	Rome	136	-2	-7	-1	-4%	DuBois	158	-2	-20	-1	-10%
Dover	038	1	20	0	10%	Staten Island	103	3	16	1	9%	East Stroudsburg	183	0	-12	0	-6%
Lebanon	037	2	-7	1	-2%	Stewart	127	-1	27	0	12%	Erie	164-165	-3	-16	-1	-9%
Littleton	035	-1	-12	0	-6%	Syracuse	130-132	-3	7	-1	2%	Genesee	169	-4	-16	-1	-9%
Manchester	032-033	0	15	0	7%	Rochester	141	-4	1	-1	-2%	Greensburg	156	-4	-2	-1	-3%
New Boston	030-031	1	23	0	11%	Rockaway	135	-4	-6	-1	-5%	Harrisburg	170-171	-2	1	-1	-1%
<b>New Jersey Average</b>	<b>1</b>	<b>22</b>	<b>0</b>	<b>11%</b>	Rome	136	-2	-7	-1	-4%	Hazleton	182	-3	-5	-1	-4%	
Atlantic City	080-084	-2	14	-1	5%	Staten Island	109	1	8	0	4%	Johnstown	159	-4	-17	-1	-10%
Brick	087	2	4	1	3%	Stewart	127	-1	27	0	12%	Kittanning	162	-4	-11	-1	-7%
Dover	078	1	23	0	11%	Syracuse	130-132	-3	7	-1	2%	Lancaster	175-176	-2	4	-1	1%
Edison	088-089	1	32	0	15%	Rochester	141	-4	1	-1	-2%	Meadville	163	-4	-25	-1	-14%
Hackensack	076	3	27	1	14%	Rockaway	135	-4	-6	-1	-5%	Montrose	188	-3	-9	-1	-6%
Monmouth	077	3	23	1	12%	Rome	136	-2	-7	-1	-4%	New Castle	161	-4	4	-1	0%
Newark	071-073	1	21	0	10%	Staten Island	103	3	16	1	9%	Philadelphia	190-191	-3	24	-1	9%
Passaic	070	2	23	1	12%	Stewart	127	-1	27	0	12%	Pittsburgh	152	-4	9	-1	2%
Paterson	074-075	2	18	1	9%	Syracuse	130-132	-3	7	-1	2%	Pottsville	179	-4	-7	-1	-5%
Princeton	085	-2	28	-1	12%	Rochester	141	-4	1	-1	-2%	Punxsutawney	157	-4	-8	-1	-6%
Summit	079	3	33	1	17%	Rockaway	135	-4	-6	-1	-5%	Reading	195-196	-4	7	-1	1%
Trenton	086	-3	23	-1	9%	Rome	136	-2	-7	-1	-4%	Scranton	184-185	-2	-3	-1	-2%
<b>New Mexico Average</b>	<b>0</b>	<b>-21</b>	<b>0</b>	<b>-10%</b>	Staten Island	109	1	8	0	4%	Somerset	155	-4	-17	-1	-10%	
Alamogordo	883	-1	-25	0	-12%	Stewart	127	-1	27	0	12%	Southeastern	193	0	21	0	10%
Albuquerque	870-871	2	-7	1	-2%	Syracuse	130-132	-3	7	-1	2%	Uniontown	154	-4	-14	-1	-9%
Clovis	881	-2	-35	-1	-17%	Rochester	141	-4	1	-1	-2%	Valley Forge	194	-3	37	-1	15%
Farmington	874	2	-9	1	-3%	Rockaway	135	-4	-6	-1	-5%	Warminster	189	-1	23	0	10%
Fort Sumner	882	-3	-3	-1	-3%	Rome	136	-2	-7	-1	-4%	Warrendale	150-151	-4	13	-1	4%
Gallup	873	1	-30	0	-13%	Staten Island	103	3	16	1	9%	Washington	153	-4	4	-1	0%
Holman	877	2	-25	1	-10%	Stewart	127	-1	27	0	12%	Wilkes Barre	186-187	-3	-2	-1	-3%
Las Cruces	880	-1	-23	0	-11%	Syracuse	130-132	-3	7	-1	2%	Williamsport	177	-3	-9	-1	-6%
Santa Fe	875	3	-14	1	-5%	Rochester	141	-4	1	-1	-2%	York	173-174	-3	4	-1	0%
Socorro	878	1	-41	0	-18%	Rockaway	135	-4	-6	-1	-5%						
Truth or Consequences	879	-2	-22	-1	-11%	Rome	136	-2	-7	-1	-4%						
Tucumcari	884	-1	-21	0	-10%	Staten Island	109	1	8	0	4%						
<b>New York Average</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>7%</b>	Stewart	127	-1	27	0	12%							
Albany	120-123	-1	18	0	8%	Syracuse	130-132	-3	7	-1	2%						
Amityville	117	2	19	1	10%	Rochester	141	-4	1	-1	-2%						
Batavia	140	-3	4	-1	0%	Rockaway	135	-4	-6	-1	-5%						
Binghamton	137-139	-3	6	-1	1%	Rome	136	-2	-7	-1	-4%						
Bronx	104	2	24	1	12%	Staten Island	103	3	16	1	9%						
Brooklyn	112	3	11	1	7%	Stewart	127	-1	27	0	12%						
Buffalo	142	-4	6	-1	1%	Syracuse	130-132	-3	7	-1	2%						
Elmira	149	-4	-2	-1	-3%	Rochester	141	-4	1	-1	-2%						
Flushing	113	3	28	1	14%	Rockaway	135	-4	-6	-1	-5%						
Garden City	115	3	25	1	13%	Rome	136	-2	-7	-1	-4%						
Hicksville	118	3	23	1	12%	Staten Island	109	1	8	0	4%						
Ithaca	148	-4	-7	-1	-5%	Stewart	127	-1	27	0	12%						
Jamaica	114	3	25	1	13%	Syracuse	130-132	-3	7	-1	2%						
Jamestown	147	-4	-9	-1	-6%	Rochester	141	-4	1	-1	-2%						
Kingston	124	0	-5	0	-2%	Rockaway	135	-4	-6	-1	-5%						
Long Island	111	3	65	1	31%	Rome	136	-2	-7	-1	-4%						
Montauk	119	1	19	0	9%	Staten Island	103	3	16	1	9%						
New York (Manhattan)	100-102	3	67	1	32%	Stewart	127	-1	27	0	12%						
New York City	100-102	3	67	1	32%	Syracuse	130-132	-3	7	-1	2%						
Newcomb	128	-1	7	0	3%	Rochester	141	-4	1	-1	-2%						
Niagara Falls	143	-4	-10	-1	-7%	Rockaway	135	-4	-6	-1	-5%						
Plattsburgh	129	1	4	0	2%	Rome	136	-2	-7	-1	-4%						
Poughkeepsie	125-126	1	1	0	1%	Staten Island	109	1	8	0	4%						
Queens	110	4	31	1	16%	Stewart	127	-1	27	0	12%						
<b>Oklahoma Average</b>	<b>1</b>	<b>-7</b>	<b>1</b>	<b>-2%</b>	Syracuse	130-132	-3	7	-1	2%							
Adrian	979	-1	-30	0	-14%	Rochester	141	-4	1	-1	-2%						
Bend	977	1	5	0	3%	Rockaway	135	-4	-6	-1	-5%						
Eugene	974	2	-9	1	-3%	Rome	136	-2	-7	-1	-4%						
<b>Oregon Average</b>	<b>1</b>	<b>-7</b>	<b>1</b>	<b>-2%</b>	Staten Island	103	3	16	1	9%							
1%Chattanooga	374	-1	9	0	4%	Stewart	127	-1	27	0	12%						
Clarksville	370	1	19	0	9%	Syracuse	130-132	-3	7	-1	2%						
Cleveland	373	-1	6	0	2%	Rochester	141	-4	1	-1	-2%						
<b>Pennsylvania Average</b>	<b>-3</b>	<b>-2</b>	<b>-1</b>	<b>-2%</b>	Rockaway	135	-4	-6	-1	-5%							
Allentown	181	-2	7	-1	2%	Rome	136	-2	-7	-1	-4%						
Altoona	166	-3	-16	-1	-9%	Staten Island	109	1	8	0	4%						
Beaver Springs	178	-3	-12	-1	-7%	Stewart	127	-1	27	0	12%						
Bethlehem	180	-1	15	0	6%	Syracuse	130-132	-3	7	-1	2%						
Bradford	167	-4	-18	-1	-10%	Rochester	141	-4	1	-1	-2%						
Butler	160	-4	3	-1	-1%	Rockaway	135	-4	-6	-1	-5%						
Chambersburg	172	-1	-11	0	-6%	Rome	136	-2	-7	-1	-4%						
Clearfield	168	2	7	1	4%	Staten Island	109	1	8	0	4%						
Cooperstown	158	-2	-20	-1	-10%	Stewart	127	-1	27	0	12%						
DoBois	155	-2	-20	-1	-10%	Syracuse	130-132	-3	7	-1	2%						
East Stroudsburg	183	0	-12	0	-6%	Rochester	141	-4	1	-1	-2%						
Erie	164-165	-3	-16	-1	-9%	Rockaway	135	-4	-6	-1	-5%						
Genesee	169	-4	-16	-1	-9%	Rome	136	-2	-7	-1	-4%						
Greensburg	156	-4	-2	-1	-3%	Staten Island	109	1	8	0	4%						
Harrisburg	170-171	-2	1	-1	-1%	Stewart	127	-1	27	0	12%						
Hazleton	182	-3	-5	-1	-4%	Syracuse	130-132	-3	7	-1	2%						
Johnstown	159	-4	-17	-1	-10%	Rochester	141	-4	1	-1	-2%						
Kittanning	162	-4	-11	-1	-7%	Rockaway	135	-4	-6	-1	-5%						
Lancaster	175-176	-2	4	-1	1%	Rome	136	-2	-7	-1	-4%						
Meadville	163	-4	-25	-1	-14%	Staten Island	109	1	8	0	4%						
Montrose	188	-3	-9	-1	-6%	Stewart	127	-1	27	0	12%						
New Castle	161	-4	4	-1	0%	Syracuse	130-132	-3	7	-1	2%						
Philadelphia	190-191	-3	24	-1	9%	Rochester	141	-4	1	-1	-2%						
Pittsburgh	152	-4	9	-1	2%	Rockaway	135	-4	-6	-1	-5%						
Pottsville	179	-4	-7	-1	-5%	Rome	136	-2	-7</td								

# Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
Columbia	384	-1	-13	0	-7%	Charlottesville	229	1	-8	0	-3%	Gillette	827	-1	-5	0	-3%
Cookeville	385	0	-8	0	-4%	Chesapeake	233	-1	-1	0	-1%	Powell	824	0	-19	0	-9%
Jackson	383	-1	11	0	5%	Culpeper	227	1	-11	0	-5%	Rawlins	823	0	-13	0	-6%
Kingsport	376	0	-7	0	-3%	Farmville	239	-2	-18	-1	-9%	Riverton	825	-1	-17	0	-8%
Knoxville	377-379	-1	2	0	0%	Fredericksburg	224-225	1	-9	0	-4%	Rock Springs	829-831	0	-2	0	-1%
McKenzie	382	-1	-20	0	-10%	Galax	243	-2	-20	-1	-10%	Sheridan	828	1	-14	0	-6%
Memphis	380-381	-1	13	0	5%	Harrisonburg	228	1	-12	0	-5%	Wheatland	822	0	-25	0	-12%
Nashville	371-372	1	21	0	10%	Lynchburg	245	-2	-15	-1	-8%						
<b>Texas Average</b>		<b>-2</b>	<b>-1</b>	<b>-1</b>	<b>-1%</b>	Norfolk	235-237	0	2	0	1%						
Abilene	795-796	-4	-8	-1	-6%	Petersburg	238	-2	-1	-1	-2%						
Amarillo	790-791	-2	-6	-1	-4%	Radford	241	-2	-16	-1	-8%						
Arlington	760	-1	17	0	7%	Reston	201	3	19	1	10%						
Austin	786-787	1	20	0	10%	Richmond	232	-1	5	0	2%						
Bay City	774	-1	22	0	10%	Roanoke	240	-1	-6	0	-3%						
Beaumont	776-777	-3	8	-1	2%	Staunton	244	0	-12	0	-6%						
Brownwood	768	-3	-18	-1	-10%	Tazewell	246	-3	-25	-1	-13%						
Bryan	778	0	-5	0	-2%	Virginia Beach	234	0	-2	0	-1%						
Childress	792	-3	-12	-1	-7%	Williamsburg	230-231	0	2	0	1%						
Corpus Christi	783-784	-2	4	-1	1%	Winchester	226	0	-11	0	-5%						
Dallas	751-753	-1	18	0	8%												
Del Rio	788	-3	-22	-1	-12%	<b>Washington Average</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1%</b>							
El Paso	798-799	-3	-21	-1	-11%	Clarkston	994	0	-12	0	-6%						
Fort Worth	761-762	-1	17	0	7%	Everett	982	2	-7	1	4%						
Galveston	775	-3	19	-1	7%	Olympia	985	2	-1	1	1%						
Giddings	789	0	-1	0	0%	Pasco	993	0	1	0	0%						
Greenville	754	-3	11	-1	3%	Seattle	980-981	3	27	1	14%						
Houston	770-772	-1	21	0	9%	Spokane	990-992	0	-7	0	-3%						
Huntsville	773	-2	17	-1	7%	Tacoma	983-984	2	9	1	5%						
Longview	756	-2	-12	-1	-7%	Vancouver	986	2	4	1	3%						
Lubbock	793-794	-3	-10	-1	-6%	Wenatchee	988	1	-12	0	-5%						
Lufkin	759	-3	-16	-1	-9%	Yakima	989	0	-13	0	-6%						
McAllen	785	-3	-23	-1	-12%	<b>West Virginia Average</b>	<b>-2</b>	<b>-13</b>	<b>-1</b>	<b>-7%</b>							
Midland	797	-3	15	-1	5%	Buckley	258-259	1	-8	0	-3%						
Palestine	758	-2	-9	-1	-5%	Bluefield	247-248	-1	-28	0	-13%						
Plano	750	0	18	0	8%	Charleston	250-253	1	5	0	3%						
San Angelo	769	-3	-13	-1	-8%	Clarksburg	263-264	-3	-3	-1	-3%						
San Antonio	780-782	-2	2	-1	0%	Fairmont	266	0	-32	0	-15%						
Texarkana	755	-3	-17	-1	-9%	Huntington	255-257	-1	-5	0	-3%						
Tyler	757	-1	-15	0	-7%	Lewisburg	249	-2	-29	-1	-14%						
Victoria	779	-2	-3	-1	-2%	Martinsburg	254	-1	-16	0	-8%						
Waco	765-767	-3	-5	-1	-4%	Morgantown	265	-3	-7	-1	-5%						
Wichita Falls	763	-3	-12	-1	-7%	New Martinsville	262	-2	-20	-1	-10%						
Woodson	764	-3	-7	-1	-5%	Parkersburg	261	-3	-13	-1	-8%						
<b>Utah Average</b>		<b>1</b>	<b>-10</b>	<b>1</b>	<b>-4%</b>	Romney	267	-4	-18	-1	-10%						
Clearfield	840	2	0	1	1%	Sugar Grove	268	-3	-22	-1	-12%						
Green River	845	1	-22	0	-10%	Wheeling	260	-3	13	-1	4%						
Ogden	843-844	0	-15	0	-7%	<b>Wisconsin Average</b>	<b>-1</b>	<b>3</b>	<b>0</b>	<b>1%</b>							
Provo	846-847	2	-14	1	-5%	Amery	540	0	0	0	0%						
Salt Lake City	841	2	3	1	2%	Beloit	535	0	7	0	3%						
<b>Vermont Average</b>		<b>1</b>	<b>-11</b>	<b>0</b>	<b>-5%</b>	Clam Lake	545	-1	-11	0	-6%						
Albany	058	1	-15	0	-6%	Eau Claire	547	-1	0	0	-1%						
Battleboro	053	1	-14	0	-6%	Green Bay	541-543	0	5	0	2%						
Beecher Falls	059	1	-18	0	-8%	La Crosse	546	-2	-1	-1	-2%						
Bennington	052	-1	-16	0	-8%	Ladysmith	548	-2	11	-1	4%						
Burlington	054	3	3	1	3%	Madison	537	2	11	1	6%						
Montpelier	056	2	-9	1	-3%	Milwaukee	530-534	0	13	0	6%						
Rutland	057	-1	-17	0	-8%	Oshkosh	549	-1	13	0	5%						
Springfield	051	-1	-13	0	-7%	Portage	539	0	3	0	1%						
White River Junction	050	1	-4	0	-1%	Prairie du Chien	538	-2	-5	-1	-3%						
<b>Virginia Average</b>		<b>0</b>	<b>-6</b>	<b>0</b>	<b>-3%</b>	Wausau	544	-1	-3	0	-2%						
Abingdon	242	-2	-15	-1	-8%	<b>Wyoming Average</b>	<b>0</b>	<b>-12</b>	<b>0</b>	<b>-6%</b>							
Alexandria	220-223	3	23	1	12%	Casper	826	-2	-11	-1	-6%						
						Cheyenne/ Laramie	820	1	-1	0	0%						

## Credits and Acknowledgments

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This book has over 30,000 cost estimates for 2023. To develop these estimates, the editors relied on information supplied by hundreds of construction cost authorities. We offer our sincere thanks to the contractors, engineers, design professionals, construction estimators, material suppliers and manufacturers who, in the spirit of cooperation, have assisted in the preparation of this Seventy-First Edition of the National Construction Estimator. Many of the cost authorities who supplied information for this volume are listed below.

**AFCO Roofing Supply**, John Ording  
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**Anthem Contracting**, Joe Caronna  
**Bell Blueprint**, Paul Moore  
**Cement Cutting, Inc.**, Matt Becker  
**Dial One**, Charlie Gindel  
**Fiorentine Company**, Tom Forsyth  
**Groundwater Data, Inc.**, John Kratz  
**H&H Specialties**, Reid Neslage  
**Iron-A-Way Company**, Reg Smidt  
**J.H. Baxter, Inc.**, Dean Rogers  
**KEL-EEZ Weatherstripping**, James Adams  
**Marbleworks of San Diego**, Charlene Butler  
**Mel-Northey Co.**, Mel Northey  
**On Time Appraisal**, Ralph Kinney  
**Prof. Photographic Service**, Larry Hoagland  
**RCP Block & Brick Co.**, Gina Adams  
**San Diego Gas & Electric**, Don Altevers  
**Superior Rock Products**, John Knieff  
**U. S. Gypsum Company**, Roger Merchet  
**West Coast Lumber Inspect. Bur.**, Jim Kneaper  
**Weyerhauser Company**, Doug Barkee  
**York Spiral Stair**, Jim A. Guerette  
Daniel Atcheson

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Photos: iStock by Getty Images™

**Adhesives**

**Adhesives** See also, Caulking, Flooring, Roofing and Tile in the Residential Division

**Panel adhesives** Better quality, gun applied in continuous bead to wood or metal framing or furring members, material only, add labor below. Per 100 SF of wall, floor, or ceiling including 6% waste.

			<b>Bead diameter</b>			
		<b>Unit</b>	<b>1/8"</b>	<b>1/4"</b>	<b>3/8"</b>	<b>1/2"</b>
Subfloor adhesive, on floors						
12" OC members	CSF	3.62	14.50	32.60	58.00	
16" OC members	CSF	2.72	10.90	24.40	43.50	
20" OC members	CSF	2.17	8.69	19.60	34.80	
24" OC members	CSF	1.81	7.24	16.30	29.00	
Wall sheathing or shear panel adhesive, on walls						
12" OC members	CSF	4.49	18.00	40.50	71.90	
16" OC members	CSF	3.37	13.50	30.30	53.90	
20" OC members	CSF	2.70	10.80	24.30	43.20	
24" OC members	CSF	2.25	8.99	20.20	36.00	
Polystyrene or polyurethane foam panel adhesive, on walls						
12" OC members	CSF	5.78	23.10	52.00	92.50	
16" OC members	CSF	4.34	17.30	39.00	69.40	
20" OC members	CSF	3.47	13.90	31.20	55.50	
24" OC members	CSF	2.89	11.60	26.00	46.30	
Gypsum drywall adhesive						
12" OC members	CSF	1.48	5.91	13.30	23.60	
16" OC members	CSF	1.11	4.43	9.97	17.70	
20" OC members	CSF	.89	3.54	7.97	14.20	
24" OC members	CSF	.74	2.95	6.64	11.80	
Hardboard or plastic panel adhesive, on walls						
12" OC members	CSF	4.98	19.90	44.80	79.70	
16" OC members	CSF	3.74	14.90	33.60	59.80	
20" OC members	CSF	2.99	12.00	26.90	47.80	
24" OC members	CSF	2.49	9.97	22.40	39.90	
		<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
Labor to apply adhesive to framing members, 1/8" to 1/2" bead diameter, no material included						
Floor or ceiling joists						
12" OC members	BC@.075	CSF	—	2.96	2.96	
16" OC members	BC@.056	CSF	—	2.21	2.21	
20" OC members	BC@.052	CSF	—	2.05	2.05	
24" OC members	BC@.042	CSF	—	1.65	1.65	
Interior and exterior wall members						
12" OC members	BC@.100	CSF	—	3.94	3.94	
16" OC members	BC@.090	CSF	—	3.55	3.55	
20" OC members	BC@.084	CSF	—	3.31	3.31	
24" OC members	BC@.068	CSF	—	2.68	2.68	

**Special purpose adhesives**

Construction adhesive, for counters, cabinets, paneling, brick veneer, ceramic fixtures, shelving, sets in 10 minutes, 10.5 oz. cartridge

— Ea 1.80 — 1.80

Epoxy-tie adhesive, bonds concrete, fills cracks to 3/4", seals doors and windows, anchor grouting, non-shrink, 22 oz. cartridge

— Ea 39.70 — 39.70

Gypsum drywall adhesive, waterproof, bonds to wood, metal, masonry, concrete, 29 oz. cartridge

— Ea 5.14 — 5.14

## Aggregate

	Craft@Hrs	Unit	Material	Labor	Total
Latex FRP adhesive, indoor, bonds wood, concrete, drywall, foamboard, trowel grade, gallon	—	Ea	25.70	—	25.70
Panel insulation adhesive, waterproof, for polyurethane & polystyrene panels, bonds to wood, metal, masonry, concrete, 4.5 lbs.	—	Ea	43.60	—	43.60
Marine adhesive/sealant, 10 oz.	—	Ea	29.30	—	29.30
Project adhesive, rubber-based, bonds plywood, hardboard fiberglass, drywall, foam board, shelving, ceramic fixtures, 10 minute work time, 10.5 oz. cartridge	—	Ea	5.16	—	5.16
<b>General purpose adhesives</b>		Unit	1 quart can	1 gallon can	
Acoustic tile adhesive, solvent base, waterproof, sound deadening type		Ea	—	18.00	
Aliphatic resin woodworking glue		Ea	15.30	40.50	
Carpet cement, outdoor		Ea	27.90	—	
Professional carpenter's glue, multi-purpose		Ea	23.10	38.20	
Contact cement, rubber based, waterproof, bonds veneers to plywood, particleboard, wallboard		Ea	19.10	46.70	
Gel contact cement		Ea	21.40	—	
Resilient flooring adhesive, latex base, adheres to concrete, plywood, felt, sheet flooring		Ea	21.50	53.00	
Tile cement, solvent base, ceramic/stone, interior		Ea	11.20	34.00	

	Craft@Hrs	Unit	Material	Labor	Total
<b>Aggregate</b> Typical prices, 5 mile haul, 24 ton minimum. See also Roofing, Built-up					
Crushed stone (1.4 tons per CY)					
3/8" stone	—	Ton	26.80	—	26.80
3/4" (Number 3)	—	Ton	24.80	—	24.80
1-1/2" (Number 2)	—	Ton	23.90	—	23.90
Crushed slag, typical prices where available					
3/4" slag	—	Ton	26.10	—	26.10
1-1/2"	—	Ton	26.60	—	26.60
Washed gravel (1.4 tons per CY)					
3/4" gravel	—	Ton	47.10	—	47.10
1-1/2"	—	Ton	51.00	—	51.00
Pea gravel, (1.4 tons per CY), typical prices where available					
3/8" or 1/2"	—	Ton	54.90	—	54.90
Sand, (1.35 tons per CY), typical prices where available					
Fill sand	—	Ton	32.50	—	32.50
Mason sand	—	Ton	41.70	—	41.70
Concrete sand	—	Ton	36.40	—	36.40
Add per ton less than 24 tons	—	Ton	9.06	—	9.06
Add for delivery over 5 miles, one way	—	Mile	11.30	—	11.30

**Appraisal Fees** Costs for determining the value of existing buildings, land, and equipment. Actual fee charged is based on the level of difficulty and the time spent on appraisal plus travel to location and cost of support services, if any. Costs include research and report by a professional state licensed appraiser. Client may request an appraisal on a "fee not to exceed" basis. Fees shown are averages and are not quoted as a percentage of value or contingent on value. The fee for cancelling an appraisal after the inspection is equal to the original appraisal fee.

## Appraisal and Arbitration Fees

	Craft@Hrs	Unit	Material	Labor	Total
Single family residences, condominiums, planned unit developments (PUDs). Fees for complex, expensive (over \$1 million) or atypical properties or those that require higher licensure than a state license are usually negotiated. Based on square feet of gross living area (excluding the garage).					
To 2,500 square feet	—	LS	—	—	413.00
Over 2,500 SF to 3,500 SF	—	LS	—	—	468.00
Over 3,500 SF to 5,000 SF	—	LS	—	—	578.00
Over 5,000 SF	—	LS	—	—	853.00
Small residential income properties (duplex, triplex, quadriplex)					
2 to 4 units	—	LS	—	—	743.00
Apartment houses, commercial and industrial buildings					
To \$300,000 valuation	—	LS	—	—	3,580.00
Over \$300,000 to \$1,000,000 valuation	—	LS	—	—	4,680.00
Over \$1,000,000 to \$3,000,000 valuation	—	LS	—	—	5,230.00
Over \$3,000,000 to \$5,000,000 valuation	—	LS	—	—	6,600.00
Other services					
Additional photograph (each)	—	LS	—	—	30.30
Outlying area fee	—	LS	—	—	60.50
Satisfactory Completion (old Form 442 / new Form 1004d)	—	LS	—	—	165.00
Appraisal update, same comps (Form 1004d)	—	LS	—	—	330.00
Operating Income Statement (FNMA 216)	—	LS	—	—	88.10
SFR Rental Survey (FNMA 1007)	—	LS	—	—	88.10
Appraisal review (desk)	—	LS	—	—	193.00
Appraisal review (field)	—	LS	—	—	413.00
Drive-by appraisal (Form 2055) starting at	—	LS	—	—	303.00
Drive-by appraisal (Form 2070/2075)	—	LS	—	—	248.00
Machinery (Fee is based on total value of equipment appraised) Additional charges for travel and lodging may be required					
To \$30,000 valuation	—	LS	—	—	682.00
Over \$30,000 to \$100,000 valuation	—	LS	—	—	914.00
Over \$100,000 to \$500,000 valuation	—	LS	—	—	1,540.00
Over \$500,000 to \$1,000,000 valuation	—	LS	—	—	2,090.00
Over \$1,000,000 to \$5,000,000 valuation	—	LS	—	—	3,580.00
Court testimony (excluding preparation)	—	Day	—	—	1,650.00
Consulting fees billed at an hourly rate	—	Hour	—	—	209.00
Outside of office meetings or court appearance are billed including travel time and expenses round trip, minimum 4 hours.					

**Arbitration and Mediation Fees** These are administrative fees paid to the American Arbitration Association (AAA). Rules and fees are subject to change. The AAA's web site at [www.adr.org](http://www.adr.org) has current rules and fee information. Fees charged by Construction Dispute Resolution Services (<http://www.constructiondisputes-cdrs.com>) will usually be less. Arbitrators are chosen from the National Roster of Construction Arbitrators and are paid a fee by the parties. Legal representation, if desired (although not necessary), is at the expense of each party. These fees do not include rental of a hearing room. An initial filing fee is payable in full by a filing party when a claim, counterclaim or additional claim is filed. A case service fee is payable at the time the first hearing is scheduled. This fee will be refunded at the conclusion of the case if no hearings have occurred so long as the Association was notified of cancellation at least 24 hours before the first scheduled hearing. The minimum AAA filing fee for any case having three or more arbitrators is \$2,750 plus a \$1,000 case service fee.

## Arbitration and Mediation Fees

	Unit	Initial Filing Fee	Case Service Fee
Claims to \$75,000	LS	925.00	800.00
Claims over \$75,000 to \$150,000	LS	1,930.00	1,380.00
Claims over \$150,000 to \$300,000	LS	2,900.00	2,200.00
Claims over \$300,000 to \$500,000	LS	4,400.00	3,850.00
Claims over \$500,000 to \$1,000,000	LS	5,500.00	6,830.00
Claims over \$1,000,000 to \$10,000,000	LS	7,700.00	8,480.00
Claims over \$10,000,000 *	LS	*	13,800.00
No Amount Stated **	LS	7,700.00	8,480.00

\* \$10 million and above – Base fee is \$10,000 plus .01% of the amount of claim above \$10 million. Filing fees are capped at \$65,000.

\*\*This fee is applicable when a claim or counterclaim is not for a monetary amount. Where a monetary claim is not known, parties will be required to state a range of claims or be subject to the highest possible filing fee.

\*\*\* Fees above based upon a 'Standard Fee Schedule' For 'Flexible Fee Schedule' costs, add 10% to the total of Initial and Case Service Fees.

Craft@Hrs	Unit	Material	Labor	Total
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**Mediation, mobile** Generally will meet at the offices of the attorneys involved in the dispute. Does not replace legal counsel but is used to maintain equity between the mediating parties. Typical fees.

Nonrefundable retainer (half from each party)	—	Ea	—	—	372.00
Weekday sessions after the initial consultation	—	Hr	—	—	186.00
Nonrefundable retainer for weekend mediation	—	Ea	—	—	449.00
Weekend mediation sessions	—	Hr	—	—	281.00

**Architectural Illustrations** Full color painting on watercolor board with matted frame with title and credit on matte. Glass and elaborate framing are extra. Costs for pen and ink illustrations with color Mylar overlay are similar to cost for watercolor illustrations. Typical fees.



Custom home, eye level view

Simple rendering	—	LS	—	—	1,020.00
Complex rendering	—	LS	—	—	1,500.00

Custom home, bird's eye view

Simple rendering	—	LS	—	—	1,240.00
Complex rendering	—	LS	—	—	1,770.00

Tract homes in groups of five or more (single floor plans, multiple elevations), eye level view

Simple rendering	—	LS	—	—	605.00
Complex rendering	—	LS	—	—	833.00

Tract homes in groups of five or more (single floor plans, multiple elevations), bird's eye view

Simple rendering	—	LS	—	—	779.00
Complex rendering	—	LS	—	—	1,260.00

Tract homes or condominium project, overall bird's eye view

10-25 homes or living units	—	LS	—	—	3,850.00
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Typical commercial structure

Eye level view	—	LS	—	—	1,740.00
Bird's eye view	—	LS	—	—	1,950.00

Complex commercial structure

Eye level view	—	LS	—	—	2,570.00
Bird's eye view	—	LS	—	—	3,310.00

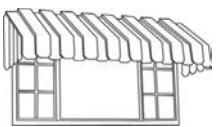
**Awnings and Canopies**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
Deduct for pen and ink drawings (no color)	—	%	—	—	-33.0
Computer generated perspective drawings using CAD system for design studies					
Custom home	—	LS	—	—	655.00
Large condo or apartment projects	—	LS	—	—	1,650.00
Tract homes	—	LS	—	—	411.00
Commercial structure, line drawing	—	LS	—	—	1,240.00

**Awnings and Canopies for Doors and Windows** All hardware included. For commercial grade awnings, see the Industrial and Commercial Division section 12, Furnishings.

Aluminum pan-type window or door awnings, .025 gauge roof and pans, .040 gauge supports

42" wide x 24" projection, 18" drop	SW@2.17	Ea	444.00	96.90	540.90
60" wide x 30" projection, 20" drop	SW@2.79	Ea	651.00	125.00	776.00
78" wide x 36" projection, 24" drop	SW@3.11	Ea	908.00	139.00	1,047.00
88" wide x 42" projection, 26" drop	SW@3.41	Ea	1,090.00	152.00	1,242.00



Polycarbonate door awnings, clear or tinted curved poly sheet in aluminum frame, 29" projection, 11" drop

61" wide	SW@2.18	Ea	400.00	97.40	497.40
119" wide	SW@6.21	Ea	722.00	277.00	999.00
178" wide	SW@8.72	Ea	1,040.00	389.00	1,429.00

Roll-up aluminum awnings with hinged support arms and pull cord assembly

36" wide x 18" projection, 27" drop	SW@2.28	Ea	294.00	102.00	396.00
48" wide x 24" projection, 34" drop	SW@2.91	Ea	340.00	130.00	470.00
54" wide x 30" projection, 39" drop	SW@3.29	Ea	349.00	147.00	496.00
60" wide x 35" projection, 44" drop	SW@3.50	Ea	369.00	156.00	525.00
72" wide x 42" projection, 51" drop	SW@4.20	Ea	432.00	188.00	620.00

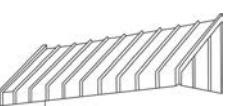
Curved top door or window canopy, rigid aluminum frame with tinted or clear polycarbonate inserts.

59" wide x 46" projection, 16" drop	BC@3.40	Ea	846.00	134.00	980.00
84" wide x 46" projection, 16" drop	BC@5.10	Ea	1,300.00	201.00	1,501.00
120" wide x 57" projection, 16" drop	BC@6.80	Ea	2,310.00	268.00	2,578.00



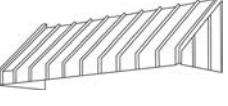
Mansard window or door awnings, 24 gauge 18"-wide standing seam steel panels, aluminum frame

54" wide x 36" projection, 36" drop	BC@3.40	Ea	2,660.00	134.00	2,794.00
72" wide x 36" projection, 36" drop	BC@4.50	Ea	2,940.00	177.00	3,117.00
90" wide x 36" projection, 36" drop	BC@5.60	Ea	3,460.00	221.00	3,681.00
108" wide x 48" projection, 48" drop	BC@6.70	Ea	3,740.00	264.00	4,004.00



Fabric door awning, with waterproof, acrylic duck, colorfast fabric, double stitched seams, tubular aluminum frame

36" wide x 26" projection	SW@1.45	Ea	264.00	64.80	328.80
40" wide x 36" projection	SW@1.86	Ea	290.00	83.10	373.10
48" wide x 40" projection	SW@2.07	Ea	313.00	92.40	405.40
72" wide x 46" projection	SW@2.27	Ea	414.00	101.00	515.00



Cloth retractable patio awning, folding spring loaded aluminum arm, dual cable manual operation.

16' wide x 12' projection	BC@3.05	Ea	5,130.00	120.00	5,250.00
20' wide x 12' projection	BC@3.40	Ea	5,870.00	134.00	6,004.00

## Barricades, Construction Safety

Craft@Hrs	Unit	Material	Labor	Total
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**Barricades, Construction Safety** Purchase prices except as noted. See also Equipment Rental in the index.

Heavy Duty Plastic Type I barricade, Engineer Grade Reflectivity, 8" height Top Panel



Quantities from 1 - 15 units	—	Ea	51.50	—	51.50
Quantities from 16 - 31 units	—	Ea	55.70	—	55.70
Pallet quantities, multiples of 32 units	—	Ea	51.50	—	51.50

Reflectorized injected plastic barricade, NCHRP-350 certified meets M.U.T.C.D. specifications 8" to 12" wide rail, 4" to 6" wide stripes, 40" legs, no light



Type I, 2' wide, 3' high, Top panel 12" height, 1 reflectorized rail each side

Quantities from 1 - 15 units	—	Ea	62.80	—	62.80
Quantities from 16 - 31 units	—	Ea	61.80	—	61.80
Pallet quantities, multiples of 32 units	—	Ea	57.20	—	57.20

Type II, 2' wide, 3' high, Top panel 8" height, 1 reflectorized rail each side

Quantities from 1 - 15 units	—	Ea	71.20	—	71.20
Quantities from 16 - 31 units	—	Ea	68.60	—	68.60
Pallet quantities, multiples of 32 units	—	Ea	63.50	—	63.50

Type III, 4' wide, 5' high, 3 reflectorized rails each side, wood & steel legs

Quantities from 1 - 15 units	—	Ea	256.00	—	256.00
Quantities from 16 - 31 units	—	Ea	252.00	—	252.00
Pallet quantities, multiples of 32 units	—	Ea	244.00	—	244.00

Add for lighted units without batteries (batteries last 2 months)

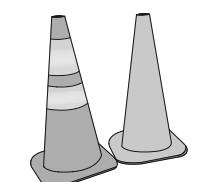


Amber lens	—	Ea	18.10	—	18.10
Red lens	—	Ea	18.10	—	18.10
Batteries, 6 volt (2 needed)	—	Ea	13.50	—	13.50

**Utility barricade lights, solar powered** Utility barricade solar powered lights, compliant with M.U.T.C.D. Specification 6E-5 and ITE Specifications for Flashing / Steady Burn warning light, 180 degree swivel base axis.

Utility barricade solar powered lights — Ea 42.90 — 42.90

### Miscellaneous signage/traffic control



"Road Closed", reflectorized, 30" x 48", Engineer Grade — Ea 120.00 — 120.00

"Construction Zone", 4' x 4' high intensity grade — Ea 328.00 — 328.00

High-rise tripod with 3 orange flags — Ea 268.00 — 268.00

Flags — Ea 5.08 — 5.08

Traffic cones, PVC Non-reflectorized type — Ea 9.32 — 9.32

18" high	—	Ea	9.32	—	9.32
28" high	—	Ea	14.20	—	14.20



Reflectorized type 18" high — Ea 11.90 — 11.90

28" high	—	Ea	24.00	—	24.00
36" high	—	Ea	30.80	—	30.80

Lane delineator, 42" orange plastic cylinder with 2 reflectors on a 12 pound rubber base — Ea 28.30 — 28.30

Mesh signs, orange, 48" x 48", includes brace and clamp — Ea 70.10 — 70.10

Hand-held traffic paddles, "Stop" and "Slow" — Ea 24.90 — 24.90

**Basement Doors**

	Craft@Hrs	Unit	Material	Labor	Total
Orange plastic safety fencing					
Budget, 4' x 50' roll, mesh opening 3" x 1.25"	—	Ea	26.70	—	26.70
Square mesh, 4' x 50' roll, opening 1.5" x 1.25"	—	Ea	27.00	—	27.00
Heavy Duty, 4' x 50' roll, opening 1.25" x 1.25"	—	Ea	67.00	—	67.00
Medium Weight 4' x 100', opening 2" x 2.5"	—	Ea	48.40	—	48.40
Barricade tape for marking construction sites, landscaping, wet paint					
Yellow plastic 3" x 1,000', "Caution"	—	Ea	9.97	—	9.97
Various colors, 3" x 200', "Danger"	—	Ea	6.47	—	6.47
<b>Utility Highway Barricade Rental</b>					
Lighted units, rental, per day	—	Ea	13.00	—	13.00
Unlighted units, rental per day	—	Ea	8.50	—	8.50
Add for pickup and delivery, per trip	—	Ea	50.00	—	50.00
Typical labor cost, place and remove any barricade					
Per use	BL@.160	Ea	—	5.12	5.12

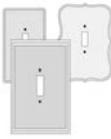
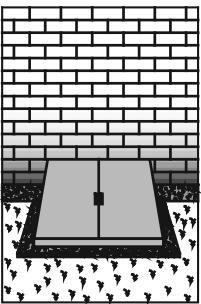
**Basement Doors** Good quality 12 gauge primed steel, center opening basement doors. Costs include assembly and installation hardware. No concrete, masonry, anchor placement or finish painting included.

## Doors (overall dimensions)

Classic Series standard, all sizes	BC@3.41	Ea	1,140.00	134.00	1,274.00
SLW Series standard, all sizes	BC@3.41	Ea	1,080.00	134.00	1,214.00
Add for powder coating	—	%	23.3	—	—
Ultra Series, polyethylene, all sizes	BC@3.41	Ea	1,660.00	134.00	1,794.00
Add for keyed lock	BC@.160	Ea	83.10	6.30	89.40
Door extensions (available for 19-1/2"H, 55"W, 72"L door only)					
6" deep	BC@1.71	Ea	292.00	67.40	359.40
12" deep	BC@1.71	Ea	356.00	67.40	423.40
18" deep	BC@1.71	Ea	422.00	67.40	489.40
Stair stringers, steel, pre-cut for 2" x 10" wood treads (without treads). Price is for a pair, or set of two stringers with hardware.					
32" to 39" stair height	BC@1.71	Pr	226.00	67.40	293.40
48" to 55" stair height	BC@1.71	Pr	298.00	67.40	365.40
56" to 64" stair height	BC@1.71	Pr	349.00	67.40	416.40
65" to 72" stair height	BC@1.71	Pr	383.00	67.40	450.40
73" to 78" stair height	BC@1.71	Pr	522.00	67.40	589.40
81" to 88" stair height	BC@1.71	Pr	564.00	67.40	631.40
89" to 97" stair height	BC@1.71	Pr	604.00	67.40	671.40

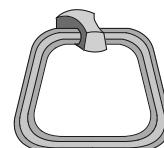
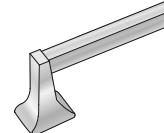
**Bathroom Accessories** Average quality. Better quality brass accessories cost 75% to 100% more. See also Medicine Cabinets and Vanities

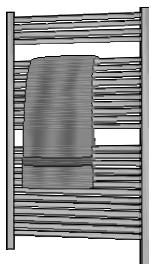
Cup and toothbrush holder, chrome	BC@.258	Ea	14.20	10.20	24.40
Cup holder, porcelain, surface mounted	BC@.258	Ea	9.94	10.20	20.14
Cup, toothbrush & soap holder, recessed	BC@.258	Ea	37.70	10.20	47.90
Cup, toothbrush holder, polished brass	BC@.258	Ea	20.10	10.20	30.30
Electrical plates, chrome plated					
Switch plate, single	BE@.154	Ea	5.27	6.64	11.91
Switch plate, double	BE@.154	Ea	6.95	6.64	13.59
Duplex receptacle plate	BE@.154	Ea	5.27	6.64	11.91
Duplex receptacle and switch	BE@.154	Ea	6.93	6.64	13.57



## Bathroom Accessories

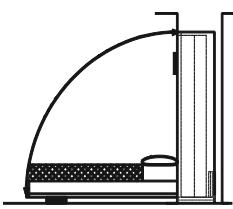
	Craft@Hrs	Unit	Material	Labor	Total
Grab bars					
Tubular chrome plated, with anchor plates					
Straight bar, 16"	BC@.414	Ea	30.90	16.30	47.20
Straight bar, 24"	BC@.414	Ea	37.70	16.30	54.00
Straight bar, 32"	BC@.414	Ea	40.70	16.30	57.00
"L"- shaped bar, 16" x 32"	BC@.620	Ea	94.60	24.40	119.00
Stainless steel, with anchor plates					
Straight bar, 16"	BC@.414	Ea	46.70	16.30	63.00
Straight bar, 24"	BC@.414	Ea	56.20	16.30	72.50
Straight bar, 32"	BC@.414	Ea	61.20	16.30	77.50
"L"- shaped bar, 16" x 32"	BC@.620	Ea	131.00	24.40	155.40
Mirrors, stainless steel framed, surface mount, no light or cabinet					
16" high x 20" wide	BG@.420	Ea	84.10	16.00	100.10
18" high x 24" wide	BG@.420	Ea	97.60	16.00	113.60
18" high x 36" wide	BG@.420	Ea	149.00	16.00	165.00
24" high x 36" wide	BG@.420	Ea	175.00	16.00	191.00
48" high x 24" wide	BG@.420	Ea	216.00	16.00	232.00
Mirrors, wood framed, surface mount, better quality					
18" x 29" rectangular	BG@.420	Ea	104.00	16.00	120.00
20" x 27" oval, oak	BG@.420	Ea	148.00	16.00	164.00
Robe hook					
Chrome	BC@.258	Ea	27.70	10.20	37.90
Double, solid brass	BC@.258	Ea	26.70	10.20	36.90
Shower curtain rods, chrome plated					
60", recessed	BC@.730	Ea	32.40	28.80	61.20
66", recessed	BC@.730	Ea	35.70	28.80	64.50
Soap holder, surface mounted, with drain holes					
Williamsburg, satin chrome	BC@.258	Ea	66.10	10.20	76.30
Polished brass	BC@.258	Ea	21.60	10.20	31.80
Facial tissue holder, stainless steel, recessed					
Toilet tissue roll holder, chrome, recessed					
Toothbrush holder, chrome, surface mount					
Towel bars, 3/4" bar					
18" long, chrome	BC@.280	Ea	17.00	11.00	28.00
24" long, chrome	BC@.280	Ea	20.20	11.00	31.20
30" long, chrome	BC@.280	Ea	23.90	11.00	34.90
36" long, chrome	BC@.280	Ea	27.20	11.00	38.20
18" long, solid brass	BC@.280	Ea	55.30	11.00	66.30
24" long, solid brass	BC@.280	Ea	58.20	11.00	69.20
Towel rack, swing-arm, chrome, 3 bars, 12" L	BC@.280	Ea	19.30	11.00	30.30
Towel rings					
Williamsburg chrome and brass	BC@.280	Ea	52.40	11.00	63.40
Williamsburg chrome and porcelain	BC@.280	Ea	50.10	11.00	61.10
Towel shelf, chrome, 24" L with bar below	BC@.280	Ea	49.00	11.00	60.00
Heated towel racks, 16" and 24" width, mounted on wall with brackets. Direct wire connection, 700 watt output. Add for electrical work					
26" high, 16" wide, standard colors	BE@.850	Ea	855.00	36.60	891.60
26" high, 24" wide, standard colors	BE@.850	Ea	912.00	36.60	948.60
26" high, 24" wide, chrome finish	BE@.850	Ea	2,820.00	36.60	2,856.60



**Blueprinting**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
35" high, 16" wide, standard colors	BE@1.00	Ea	1,070.00	43.10	1,113.10
35" high, 24" wide, standard colors	BE@1.00	Ea	1,010.00	43.10	1,053.10
35" high, 24" wide, chrome finish	BE@1.00	Ea	3,400.00	43.10	3,443.10
44" high, 16" wide, standard colors	BE@1.10	Ea	1,070.00	47.40	1,117.40
44" high, 24" wide, standard colors	BE@1.10	Ea	1,130.00	47.40	1,177.40
44" high, 24" wide, chrome finish	BE@1.10	Ea	3,720.00	47.40	3,767.40
Add for direct wire w/ control panel	BE@.100	Ea	235.00	4.31	239.31
Add for wall plug in	BE@.100	Ea	315.00	4.31	319.31
Heated towel rack accessories					
Programmable control panel	BE@.250	Ea	306.00	10.80	316.80
Pull out drying racks	BE@.250	Ea	85.80	10.80	96.60
Robe knobs	BE@.150	Ea	55.20	6.46	61.66
Towel bar accents with standard colors	BE@.150	Ea	110.00	6.46	116.46
Towel bar accents with chrome finish	BE@.150	Ea	148.00	6.46	154.46
Robe knob accents (all styles)	BE@.150	Ea	256.00	6.46	262.46
Tub or shower chairs					
Wall-hung elevated fixed seat	BE@.750	Ea	40.20	32.30	72.50
White adjustable seat	BE@.750	Ea	74.90	32.30	107.20

**Beds, Folding** Concealed-in-wall type. Steel framed, folding wall bed system. Bed requires 18-5/8" or 22" deep recess. Includes frame, lift mechanism, all hardware. Installed in framed opening. Padded vinyl headboard. Bed face panel accepts paint, wallpaper, vinyl or laminate up to 1/4" thick. Box spring and mattress not included. Murphy Wall Beds



Twin, frames and mechanisms	B1@5.41	Ea	892.00	193.00	1,085.00
Double, frames and mechanisms	B1@5.41	Ea	934.00	193.00	1,127.00
Queen, frames and mechanisms	B1@5.41	Ea	976.00	193.00	1,169.00
King, frames and mechanisms	B1@5.41	Ea	1,070.00	193.00	1,263.00
Add for wood-tone melamine cabinet	—	LS	1,580.00	—	1,580.00
Add for white melamine cabinet	—	LS	1,410.00	—	1,410.00

**Blueprinting** (Reproduction only) Assumes original is on semi-transparent drafting paper or film. See also Architectural Illustration and Drafting. Cost per square foot reproduced except as noted. Stapled edge and binder included.

Blueline or blackline prints

1-100 SF	—	SF	—	—	.22
101-1,000 SF	—	SF	—	—	.20
1,001-2,000 SF	—	SF	—	—	.19
2,001-to 3,000 SF	—	SF	—	—	.17
3,001-4,000 SF	—	SF	—	—	.09
4,001 SF and higher	—	SF	—	—	.08
Presentation blackline (heavy paper)	—	SF	—	—	.57
Sepia	—	SF	—	—	.85
Mylar	—	SF	—	—	2.83

Xerographic prints

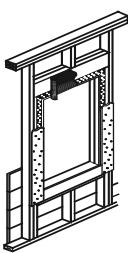
Vellum	—	SF	—	—	1.13
Erasable vellum	—	SF	—	—	1.42
Mylar	—	SF	—	—	2.83
Enlargements (bond)	—	SF	—	—	.68
Reductions (bond, per sheet)	—	Ea	—	—	2.82

## Building Inspection Service

	Craft@Hrs	Unit	Material	Labor	Total
Plotting prints					
Translucent bond	—	SF	—	—	1.70
Vellum	—	SF	—	—	1.97
Erasable vellum	—	SF	—	—	2.81
Mylar	—	SF	—	—	2.83
Photo prints					
Mylar	—	SF	—	—	6.34
Add for local pickup and delivery, round trip	—	LS	—	—	25.00
<b>Building Inspection Service</b> (Home inspection service) Inspection of all parts of building by qualified engineer or certified building inspection technician. Includes written report covering all doors and windows, electrical system, foundation, heating and cooling system, insulation, interior and exterior surface conditions, landscaping, plumbing system, roofing, and structural integrity.					
Single-family residence					
Base fee (up to 2,500 SF)	—	LS	—	—	354.00
Add for additional 1,000 SF or fraction	—	LS	—	—	108.00
Add for out buildings (each)	—	LS	—	—	54.40
Add for houses over 50 years old	—	LS	—	—	81.60
Add per room for houses with over 10 rooms	—	Ea	—	—	65.20
Add per room for houses with over 15 rooms	—	Ea	—	—	70.80
Add for swimming pool, spa or sauna	—	LS	—	—	215.00
Add for soil testing (expansive soil only)	—	LS	—	—	217.00
Add for water testing (coliform only)	—	LS	—	—	76.30
Add for warranty protection					
Houses to 10 rooms & 50 years old	—	LS	—	—	272.00
Houses over 50 years old	—	LS	—	—	292.00
Houses over 10 rooms	—	LS	—	—	294.00
Multi-family structures					
Two family residence base fee	—	LS	—	—	491.00
Apartment or condominium base fee	—	LS	—	—	272.00
Warranty protection (base cost)	—	LS	—	—	272.00
Add for each additional unit	—	LS	—	—	54.50
Add for each family living unit					
Standard inspection	—	LS	—	—	54.40
Detailed inspection	—	LS	—	—	81.00
Add for swimming pool, spa, sauna	—	LS	—	—	81.60
Add for potable water quality testing	—	LS	—	—	245.00
Add for water quantity test, per well	—	LS	—	—	163.00
Add for soil testing (EPA toxic)	—	LS	—	—	1,630.00
Add for soil testing (lead)	—	LS	—	—	49.10
Add for lead paint testing, full analysis, per room	—	LS	—	—	43.50
Hazards testing for single and multi-family dwellings					
Urea-formaldehyde insulation testing	—	LS	—	—	190.00
Asbestos testing	—	LS	—	—	192.00
Radon gas testing	—	LS	—	—	137.00
Geotechnical site examination, typical price	—	LS	—	—	437.00

**Building Paper**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
<b>Building Paper</b> See also Roofing for roof applications and Polyethylene Film. Costs include 7% coverage allowance for 2" lap and 5% waste allowance. See installation costs at the end of this section.					
Asphalt felt, 36" wide					
15 lb., ASTM F45 (432 SF roll)	—	SF	.09	—	.09
15 lb., F40 (432 SF roll)	—	SF	.09	—	.09
30 lb. (216 SF roll)	—	SF	.18	—	.18
Asphalt shake felt, 18" x 72"					
30 lb. (108 SF roll)	—	SF	.33	—	.33
Building paper, 40" wide					
Single ply, black (1,078 SF roll)	—	SF	.07	—	.07
Two ply (539 SF roll)	—	SF	.10	—	.10
Aquabar™, two layer, laminated with asphalt, Fortifiber™ products					
Class A, 36" wide, 30-50-30					
(1,000 SF roll)	—	SF	.07	—	.07
Class B, 36" wide, 30-30-30					
(500 SF roll)	—	SF	.09	—	.09
Ice and water shield, self-adhesive rubberized asphalt and poly					
225 SF roll	—	SF	1.12	—	1.12
High temperature, 225 SF roll	—	SF	1.23	—	1.23
"Jumbo Tex" gun grade sheathing paper, 40" wide, asphalt saturated					
(324 SF roll)	—	SF	.07	—	.07
"Jumbo Tex" black building paper, 36", 40" wide, asphalt saturated					
(500 SF roll)	—	SF	.12	—	.12
"Super Jumbo Tex" two-ply, 60 minute, asphalt saturated Kraft					
(162 SF roll)	—	SF	.16	—	.16
Red rosin sized sheathing (duplex sheathing) 36" wide					
(501 SF roll)	—	SF	.03	—	.03
Bruce rosin paper, floor underlayment					
(500 SF roll)	—	SF	.04	—	.04
Moistop flashing paper, Fortifiber™, 12" wide x 300' long					
(300 SF roll)	—	SF	.19	—	.19
Vycor window and door flashing, self adhesive, Grace					
6" x 75' roll, 25 mil thickness	—	SF	2.70	—	2.70
Vycor deck protector, self adhesive joist flashing, Grace					
4" x 75' roll, Roll covers 66 LF of joist	—	LF	2.83	—	2.83
Plasterkraft grade D weather-resistive sheathing paper, 40" wide					
Super 60 minute (500 SF roll)	—	SF	.06	—	.06
Ten minute 2-ply (500 SF roll)	—	SF	.05	—	.05
Roof flashing paper, seals around skylights, dormers, vents, valleys and eaves, rubberized, fiberglass reinforced, self-adhesive					
GAF StormGuard™ Roll covers 200 SF	—	SF	.75	—	.75
Roof underlayment, for use under shingles, granular surface					
Weatherlock® 200 SF roll	—	SF	.73	—	.73
Tri-Flex roof underlayment, for use under shingles, tile, slate or metal roofing					
48" x 250', 1,000 SF roll	—	SF	.19	—	.19
Below grade vapor barrier, Fortifiber™ Moistop					
fiberglass reinforced Kraft between 2 layers of polyethylene)					
8' x 250' roll (2,000 SF roll)	—	SF	.27	—	.27



## Building Permit Fees

	Craft@Hrs	Unit	Material	Labor	Total
Concrete curing papers, Fortifiber™					
Orange Label Sisalkraft (fiberglass and adhesive between 2 layers of Kraft), 4.8 lbs. per CSF					
48" x 125' roll, (500 SF roll)	—	SF	.35	—	.35
Sisalkraft SK-10, economy papers, fiberglass and adhesive between 2 layers of Kraft, 4.2 lbs. per CSF					
48" x 300' roll (1,200 SF roll)	—	SF	.11	—	.11
Protective paper, Fortifiber™ Seekure					
(fiberglass reinforcing strands and nonstaining adhesive between 2 layers of Kraft)					
8" x 300' roll, (2,400 SF)	—	SF	.13	—	.13
House wrap membrane, aka Tyvek™ HomeWrap by DuPont					
Air/moisture infiltration barrier (high-density polyethylene fibers in sheet form)					
3' x 100' rolls or					
9' x 150' rolls	—	SF	.21	—	.21
House wrap tape, 2" x 165'	—	LF	.11	—	.11
Labor to install building papers					
Felts, vapor barriers, infiltration barriers, building papers on walls					
Tack stapled, typical	BC@.002	SF	—	.08	.08
Heavy stapled, typical	BC@.003	SF	—	.12	.12
Felts, vapor barriers, infiltration barriers, building papers on ceilings and roofs					
Tack stapled, typical	BC@.004	SF	—	.16	.16
Heavy stapled, typical	BC@.006	SF	—	.24	.24
Self-adhesive, typical	BC@.006	SF	—	.24	.24
Curing papers, protective papers and vapor barriers, minimal fasteners	BC@.001	SF	—	.04	.04
Flashing papers, 6" to 8" wide	BC@.010	LF	—	.39	.39

**Building Permit Fees** Fees are set by each jurisdiction and are based on the type of construction and the square foot area. Most building departments either publish a fee schedule or offer a Web-based fee calculator. The permit fee will usually be doubled when work is started without a permit. When the valuation of the proposed construction exceeds \$1,000, plans are usually required. For most residential construction, building permit will be about 1% of the construction cost (with a \$200 minimum) based on a table of values published by the International Code Council at:

<https://www.iccsafe.org/products-and-services/i-codes/code-development-process/building-valuation-data/>

Most wood-frame residences are Group R3 and Type VB. This estimate of 1% includes the plan check fee, building, plumbing, HVAC and electrical permits, GIS mapping and issuance of a certificate of occupancy.

Permits required by planning authorities will be extra. Estimate the fee for reinspection at \$145 per hour.

Inspections outside normal business hours are about \$145 per hour with a two-hour minimum. Estimate the fee for additional plan review required by changes, additions or revisions to approved plans at \$155 per hour with a one-half hour minimum.

Minimum building permit fee	—	LS	200.00	—	200.00
Typical fee based on estimated total construction cost	—	%	1.0	—	—

**Cabinets, Kitchen**

Craft@Hrs	Unit	Material	Labor	Total
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**Cabinets, Kitchen** See also Vanities. Good quality mill-made modular units with solid hardwood face frames, hardwood door frames and drawer fronts, hardwood veneer on raised door panels (front and back), glued mortise, dowel, and dado joint construction, full backs (1/8" vinyl laminated plywood), vinyl laminated cabinet interiors, vinyl laminated composition drawer bodies with nylon and metal guides. Includes self-closing hinges, door and drawer pulls, mounting hardware and adjustable shelves. See illustrations for unit types. See the price adjustments below for pricing of other units. No countertops included. See Countertops, page 96.

Kitchen cabinet costs vary widely. The prices listed in this section are for standard grade residential cabinets. Add 65% to material costs for premium grade cabinets with solid hardwood fronts and frames, mitered corners and solid wood drawer bodies with steel guides and ball bearings. Deduct 45% from material costs for economy grade cabinets, laminated plastic on particleboard.

**Cabinets, Rule of Thumb** Cabinet cost per running foot of cabinet installed. These figures are based on a set of semi-custom, mill-fabricated and assembled kitchen cabinets including a sink base cabinet, one 3-drawer base cabinet and six door base cabinets. Per linear foot of front or back edge, whichever is longer.

Base cabinets, 34-1/2" high, 24" deep  
Wall cabinets, 30" high, 12" deep

BC@.521	LF	188.00	20.50	208.50
BC@.340	LF	98.50	13.40	111.90

**Cabinets, Kitchen** (See the note above on cabinet costs.)

One door base cabinets, 34-1/2" high, 24" deep

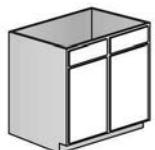
9" wide, tray divider	BC@.461	Ea	177.00	18.20	195.20
12" wide, 1 door, 1 drawer	BC@.461	Ea	237.00	18.20	255.20
15" wide, 1 door, 1 drawer	BC@.638	Ea	254.00	25.10	279.10
18" wide, 1 door, 1 drawer	BC@.766	Ea	267.00	30.20	297.20
21" wide, 1 door, 1 drawer	BC@.766	Ea	291.00	30.20	321.20
24" wide, 1 door, 1 drawer	BC@.911	Ea	297.00	35.90	332.90



DRAWER BASE

Drawer base cabinets, 34-1/2" high, 24" deep

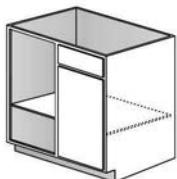
15" wide, 4 drawers	BC@.638	Ea	260.00	25.10	285.10
18" wide, 4 drawers	BC@.766	Ea	277.00	30.20	307.20
24" wide, 4 drawers	BC@.911	Ea	321.00	35.90	356.90



SINK BASE

Sink base cabinets, 34-1/2" high, 24" deep

24" wide, 1 door, 1 drawer front	BC@.740	Ea	254.00	29.20	283.20
30" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	305.00	30.20	335.20
33" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	321.00	30.20	351.20
36" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	329.00	30.20	359.20
42" wide, 2 doors, 2 drawer fronts	BC@.911	Ea	363.00	35.90	398.90
48" wide, 2 doors, 2 drawer fronts	BC@.911	Ea	399.00	35.90	434.90



BLIND CORNER BASE

Two door base cabinets, 34-1/2" high, 24" deep

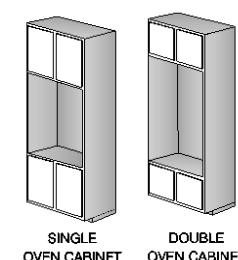
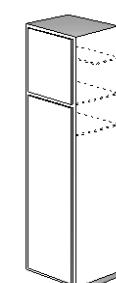
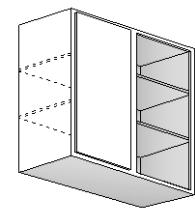
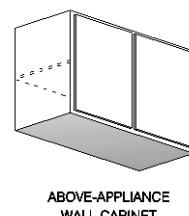
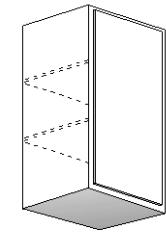
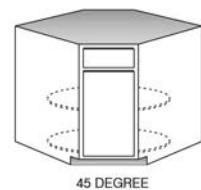
27" wide, 2 door, 2 drawer front	BC@1.25	Ea	392.00	49.30	441.30
30" wide, 2 doors, 2 drawer fronts	BC@1.25	Ea	414.00	49.30	463.30
33" wide, 2 doors, 2 drawer fronts	BC@1.25	Ea	433.00	49.30	482.30
36" wide, 2 doors, 2 drawer fronts	BC@1.35	Ea	456.00	53.20	509.20
42" wide, 2 doors, 2 drawer fronts	BC@1.50	Ea	475.00	59.10	534.10
48" wide, 2 doors, 2 drawer fronts	BC@1.71	Ea	528.00	67.40	595.40

Blind corner base cabinets, 34-1/2" high

Minimum 36", maximum 39" at wall	BC@1.39	Ea	291.00	54.80	345.80
Minimum 39", maximum 42" at wall	BC@1.50	Ea	313.00	59.10	372.10
Corner base cabinet, revolving shelves 34-1/2" high x 36" wide at walls	BC@2.12	Ea	450.00	83.50	533.50

## Cabinets, Kitchen

	Craft@Hrs	Unit	Material	Labor	Total
Corner sink front, 34-1/2" high 40" wide at walls	BC@2.63	Ea	254.00	104.00	358.00
Wall cabinets, adjustable shelves, 30" high, 12" deep 9" wide, 1 door	BC@.461	Ea	160.00	18.20	178.20
12" wide or 15" wide, 1 door	BC@.461	Ea	174.00	18.20	192.20
18" wide, 1 door	BC@.638	Ea	206.00	25.10	231.10
21" wide, 1 door	BC@.638	Ea	212.00	25.10	237.10
24" wide, 1 door	BC@.766	Ea	228.00	30.20	258.20
27" wide, 2 doors	BC@.766	Ea	267.00	30.20	297.20
30" wide, 2 doors	BC@.911	Ea	267.00	35.90	302.90
33" wide, 2 doors	BC@.911	Ea	291.00	35.90	326.90
36" wide, 2 doors	BC@1.03	Ea	306.00	40.60	346.60
42" wide, 2 doors	BC@1.03	Ea	329.00	40.60	369.60
48" wide, 2 doors	BC@1.16	Ea	355.00	45.70	400.70
Above-appliance wall cabinets, 12" deep 12" high, 30" wide, 2 doors	BC@.461	Ea	169.00	18.20	187.20
15" high, 30" wide, 2 doors	BC@.461	Ea	193.00	18.20	211.20
15" high, 33" wide, 2 doors	BC@.537	Ea	207.00	21.20	228.20
15" high, 36" wide, 2 doors	BC@.638	Ea	212.00	25.10	237.10
18" high, 18" wide, 2 doors	BC@.537	Ea	160.00	21.20	181.20
18" high, 30" wide, 2 doors	BC@.766	Ea	212.00	30.20	242.20
18" high, 36" wide, 2 doors	BC@.911	Ea	234.00	35.90	269.90
Corner wall cabinets, 30" high, 12" deep 24" at each wall, fixed shelves	BC@1.03	Ea	291.00	40.60	331.60
24" at each wall, revolving shelves	BC@1.03	Ea	390.00	40.60	430.60
Blind corner wall cabinets, 30" high 24" minimum, 1 door	BC@1.03	Ea	220.00	40.60	260.60
36" minimum, 1 door	BC@1.32	Ea	267.00	52.00	319.00
42" minimum, 2 doors	BC@1.20	Ea	335.00	47.30	382.30
Utility cabinets, 66" high, 12" deep, no shelves 18" wide	BC@1.32	Ea	335.00	52.00	387.00
24" wide	BC@1.71	Ea	383.00	67.40	450.40
Utility cabinets, 66" high, 24" deep, add shelf cost below					
18" wide	BC@1.24	Ea	355.00	48.90	403.90
24" wide	BC@1.71	Ea	421.00	67.40	488.40
Add for utility cabinet revolving shelves, includes mounting hardware 18" wide x 24" deep	BC@.360	Ea	305.00	14.20	319.20
24" wide x 24" deep	BC@.360	Ea	357.00	14.20	371.20
Add for utility cabinet plain shelves 18" wide x 24" deep	BC@.541	Ea	103.00	21.30	124.30
24" wide x 24" deep	BC@.541	Ea	108.00	21.30	129.30
Oven cabinets, 66" high, 24" deep 27" wide, single oven	BC@2.19	Ea	426.00	86.30	512.30
27" wide, double oven	BC@2.19	Ea	322.00	86.30	408.30



**Cabinets, Kitchen**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
Microwave cabinet, with trim, 21" high, 20" deep, 30" wide	BC@.986	Ea	256.00	38.80	294.80
Additional labor costs for cabinets					
Tall utility, pantry, or oven cabinets	BC@2.00	Ea	—	78.80	78.80
Tall wall cabinet to counter level	BC@1.50	Ea	—	59.10	59.10
Hood cabinet over a range with vent cutout	BC@1.50	Ea	—	59.10	59.10
3/4" raised end panels applied to cabinet ends	BC@.250	Ea	—	9.85	9.85
Refrigerator end panels, cut, fit, install	BC@.500	Ea	—	19.70	19.70
Cabinet end panels, most sizes, per panel					
Refrigerator end panels	BC@.557	Ea	—	21.90	21.90
Refrigerator end panels with return	BC@1.00	Ea	—	39.40	39.40
Applied decorative end panels	BC@.334	Ea	—	13.20	13.20
Mitered island end or back panels	BC@.667	Ea	—	26.30	26.30
Dishwasher return panels	BC@.667	Ea	—	26.30	26.30
Precut filler panels installed between cabinets, per panel					
Most base or wall fillers	BC@.200	Ea	—	7.88	7.88
Most base or wall fillers with overlays	BC@.400	Ea	—	15.80	15.80
Tall filler panels over 36"	BC@.268	Ea	—	10.60	10.60
Tall filler panels over 36" with overlays	BC@.535	Ea	—	21.10	21.10
Corner filler panels	BC@.224	Ea	—	8.83	8.83
Corner fillers panels with overlays	BC@.448	Ea	—	17.70	17.70
Angled corner filler panels	BC@.268	Ea	—	10.60	10.60
Angled corner filler panels with overlays	BC@.536	Ea	—	21.10	21.10
Moldings and trim for cabinet work					
Scribe molding, per 8' length	BC@.224	Ea	—	8.83	8.83
Scribe molding, per linear foot	BC@.028	LF	—	1.10	1.10
Crown molding, per 8' length, miter cut	BC@.448	Ea	—	17.70	17.70
Crown molding, per 8' length, butt joint	BC@.180	Ea	—	7.09	7.09
Crown plate and riser, per miter cut	BC@.180	Ea	—	7.09	7.09
Crown plate and riser, per straight cut	BC@.112	Ea	—	4.41	4.41
Applied molding, per miter cut	BC@.112	Ea	—	4.41	4.41
Applied molding, per straight cut	BC@.067	Ea	—	2.64	2.64
Light rail molding, per miter cut	BC@.224	Ea	—	8.83	8.83
Light rail molding, per straight cut	BC@.067	Ea	—	2.64	2.64
Furniture toe kick, per 8' length	BC@.334	Ea	—	13.20	13.20
Furniture toe kick, per linear foot	BC@.042	LF	—	1.65	1.65
Valance, straight, per 8' length	BC@.334	Ea	—	13.20	13.20
Valance, with side returns or cap, 8' length	BC@.667	Ea	—	26.30	26.30
Mantle or hood molding, length to 8'	BC@.800	Ea	—	31.50	31.50
Corbels, plain	BC@.224	Ea	—	8.83	8.83
Corbels, on uprights	BC@.334	Ea	—	13.20	13.20
Enkeboll molding, miter cut, 8' length	BC@.667	Ea	—	26.30	26.30
Enkeboll molding, straight cut, 8' length	BC@.180	Ea	—	7.09	7.09
Posts, to 8' length	BC@.500	Ea	—	19.70	19.70
Pilasters	BC@.334	Ea	—	13.20	13.20
Cabinet feet, per cabinet	BC@.334	Ea	—	13.20	13.20
Cabinet extras					
Scribing in wood tops	BC@.133	LF	—	5.24	5.24
Job built 2 x 4 support wall to 42" high	BC@.334	LF	—	13.20	13.20
Framing for range support or sink cutout	BC@.667	Ea	—	26.30	26.30

## Carpentry

Craft@Hrs	Unit	Material	Labor	Total
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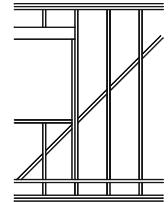
**Carpentry** See also carpentry items in other sections: Carpentry Steel Framing, Cabinets, Ceilings, Closet Door Systems, Countertops, Cupolas, Doors, Entrances, Flooring, Framing Connectors, Hardboard, Hardware, Lumber, Molding, Paneling, Shutters, Siding, Skylights, Soffits, Stairs, Thresholds, and Weatherstripping.

**Carpentry Rule of Thumb** Typical rough carpentry (framing) cost per square foot of floor in living area.

These figures will apply on many residential jobs where joists, studs and rafters are 16" on center.

Unconventional designs and complex framing plans will cost more. See detailed cost breakdowns in the next section.

Using framing lumber at	—	MBF	1,390.00	—	1,390.00
Using 1/2" OSB sheathing at	—	MSF	1,290.00	—	1,290.00
Using 7/16" OSB sheathing at	—	MSF	1,020.00	—	1,020.00
Using 5/8" OSB sheathing at	—	MSF	1,430.00	—	1,430.00
Using 1/2" RTD sheathing at	—	MSF	1,520.00	—	1,520.00
Using 5/8" RTD sheathing at	—	MSF	1,540.00	—	1,540.00
Single story, conventional foundation	B1@.237	SF	11.57	8.46	20.03
Single story, concrete slab foundation	B1@.180	SF	7.66	6.43	14.09
First of two floors, conventional foundation	B1@.203	SF	8.87	7.25	16.12
First of two floors, concrete slab foundation	B1@.146	SF	4.96	5.22	10.18
Second floor of a two-story residence	B1@.191	SF	9.31	6.82	16.13
Add for plywood sheathing	—	%	6.0	—	—



### Framing a single story residence, conventional crawl-space foundation

Sills, pier blocks, floor beams (145 BF per 1,000 SF)	B1@.018	SF	.20	.64	.84
Floor joists, doublers, blocking, bridging (1,480 BF per 1,000 SF)	B1@.028	SF	2.06	1.00	3.06
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	1.65	.39	2.04
Layout, studs, sole plates, top plates, header and end joists, backing, blocking, bracing and framing for openings (2,250 BF per 1,000 SF)	B1@.093	SF	3.14	3.32	6.46
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	1.48	1.61	3.09
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC, (1,340 BF per 1,000 SF)	B1@.032	SF	1.87	1.14	3.01
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	1.17	.36	1.53
<b>Total framing, single story, conventional foundation</b>	<b>B1@.237</b>	<b>SF</b>	<b>11.57</b>	<b>8.46</b>	<b>20.03</b>
Add for plywood sheathing	—	%	6.0	—	—

### Framing a single story residence, concrete slab foundation

Layout, sole plates, anchors, studs, top plates, header and end joists, backing, blocking, bracing and framing for openings (2,250 BF per 1,000 SF)	B1@.093	SF	3.14	3.32	6.46
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	1.48	1.61	3.09
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC, (1,340 BF per 1,000 SF)	B1@.032	SF	1.87	1.14	3.01
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	1.17	.36	1.53
<b>Total framing, single story, concrete slab foundation</b>	<b>B1@.180</b>	<b>SF</b>	<b>7.66</b>	<b>6.43</b>	<b>14.09</b>
Add for plywood sheathing	—	%	7.5	—	—

**Carpentry, Assemblies**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
<b>Framing the first of two floors, conventional crawl-space foundation</b>					
Sills, pier blocks, floor beams (145 BF per 1,000 SF)	B1@.018	SF	.20	.64	.84
Floor joists, doublers, blocking, bridging (1,480 BF per 1,000 SF)	B1@.028	SF	2.06	1.00	3.06
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	1.65	.39	2.04
Layout, studs, sole plates, top plates, header and end joists, backing, blocking, bracing and framing for openings (2,250 BF per 1,000 SF)	B1@.093	SF	3.14	3.32	6.46
Rough stairway, 15 risers and landing (96 BF of dimension lumber and 128 SF of plywood per 1,000 SF)	B1@.008	SF	.34	.29	.63
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	1.48	1.61	3.09
<b>Total framing, 1st of 2 floors, crawl-space foundation</b>	<b>B1@.203</b>	<b>SF</b>	<b>8.87</b>	<b>7.25</b>	<b>16.12</b>
Add for plywood sheathing	—	%	1.3	—	—
<b>Framing the first of two floors, concrete slab foundation</b>					
Layout, sole plates, anchors, studs, top plates, header and end joists, backing, blocking, bracing and framing for openings (2,250 BF per 1,000 SF)	B1@.093	SF	3.14	3.32	6.46
Rough stairway, 15 risers and landing (96 BF of dimension lumber and 128 SF of plywood per 1,000 SF)	B1@.008	SF	.34	.29	.63
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	1.48	1.61	3.09
<b>Total framing, first of two floors, concrete foundation</b>	<b>B1@.146</b>	<b>SF</b>	<b>4.96</b>	<b>5.22</b>	<b>10.18</b>
<b>Framing the second story of a residence</b>					
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	1.65	.39	2.04
Layout, studs, sole plates, top plates, header and end joists, backing, blocking, bracing and framing for openings (2,250 BF per 1,000 SF)	B1@.093	SF	3.14	3.32	6.46
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	1.48	1.61	3.09
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC (1,340 BF per 1,000 SF)	B1@.032	SF	1.87	1.14	3.01
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	1.17	.36	1.53
<b>Total framing, second floor of a two-story residence</b>	<b>B1@.191</b>	<b>SF</b>	<b>9.31</b>	<b>6.82</b>	<b>16.13</b>
Add for plywood sheathing	—	%	7.5	—	—

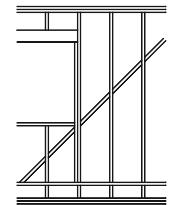
**Floor Assemblies** Costs for wood framed floor joists with subflooring and R-19 insulation. These costs include the floor joists, subflooring as described, blocking, nails and 6-1/4" thick R-1.9 fiberglass insulation between the floor joists. Figures include box or band joists and typical double joists. No beams included. Planked subflooring is based on 1.24 BF per square foot of floor. Costs shown are per square foot of area covered and include normal waste. Deduct for openings over 25 SF.

Using framing lumber at	—	MBF	1,390.00	—	1,390.00
Using 5/8" RTD plywood subfloor at	—	MSF	1,540.00	—	1,540.00
Using 3/4" RTD plywood subfloor at	—	MSF	1,710.00	—	1,710.00
Using 7/16" OSB subfloor at	—	MSF	1,020.00	—	1,020.00
Using 5/8" OSB subfloor at	—	MSF	1,430.00	—	1,430.00
Using 3/4" OSB T&G subfloor at	—	MSF	1,710.00	—	1,710.00

## Carpentry, Assemblies

	Craft@Hrs	Unit	Material	Labor	Total
Floor joists 16" OC, R-19 insulation and OSB subflooring					
7/16" OSB subfloor					
2" x 6" joists	B1@.040	SF	3.93	1.43	5.36
2" x 8" joists	B1@.041	SF	4.44	1.46	5.90
2" x 10" joists	B1@.043	SF	5.22	1.53	6.75
2" x 12" joists	B1@.044	SF	6.47	1.57	8.04
Floor joists 16" OC, R-19 insulation and OSB subflooring					
5/8" OSB subfloor					
2" x 6" joists	B1@.040	SF	4.35	1.43	5.78
2" x 8" joists	B1@.041	SF	4.86	1.46	6.32
2" x 10" joists	B1@.043	SF	5.64	1.53	7.17
2" x 12" joists	B1@.044	SF	6.89	1.57	8.46
3/4" OSB subfloor					
2" x 6" joists	B1@.042	SF	4.63	1.50	6.13
2" x 8" joists	B1@.043	SF	5.14	1.53	6.67
2" x 10" joists	B1@.045	SF	5.92	1.61	7.53
2" x 12" joists	B1@.046	SF	7.17	1.64	8.81
Floor joists 16" OC, R-19 insulation and plywood subflooring					
5/8" plywood subfloor					
2" x 6" joists	B1@.040	SF	4.41	1.43	5.84
2" x 8" joists	B1@.041	SF	4.92	1.46	6.38
2" x 10" joists	B1@.043	SF	5.70	1.53	7.23
2" x 12" joists	B1@.044	SF	6.95	1.57	8.52
3/4" plywood subfloor					
2" x 6" joists	B1@.042	SF	4.63	1.50	6.13
2" x 8" joists	B1@.043	SF	5.13	1.53	6.66
2" x 10" joists	B1@.045	SF	5.92	1.61	7.53
2" x 12" joists	B1@.046	SF	7.16	1.64	8.80
For different type insulation					
Fiberglass batts					
10" thick R-30, add	—	SF	.15	—	.15
12" thick R-38, add	—	SF	.83	—	.83

**Wall Assemblies** Costs for wood framed stud walls with wall finish treatment on both sides. These costs include wall studs at 16" center to center, double top plates, single bottom plates, fire blocking, nails and wall finish treatment as described. No headers or posts included. All lumber is Std & Btr. 2" x 4" walls have 1.12 BF per SF of wall and 2" x 6" walls have 1.68 BF per SF of wall. Costs shown are per SF or LF of wall measured on one face and include normal waste.



Using 2 x 4 lumber at	—	MBF	1,370.00	—	1,370.00
Using 2 x 6 lumber at	—	MBF	1,330.00	—	1,330.00
Using 1/2" gypsum wallboard at	—	SF	.50	—	.50
Using 5/8" gypsum wallboard at	—	SF	.54	—	.54

### Interior wall assemblies

2" x 4" stud walls with 1/2" gypsum drywall both sides, ready for painting					
Cost per square foot of wall	B1@.064	SF	2.16	2.28	4.44
Cost per running foot, for 8' high walls	B1@.512	LF	17.30	18.30	35.60
2" x 4" stud walls with 1/2" gypsum drywall one side, ready for painting					
Cost per square foot of wall	B1@.046	SF	1.66	1.64	3.30
Cost per running foot, for 8' high walls	B1@.368	LF	13.20	13.10	26.30
2" x 4" stud walls with 5/8" gypsum fire rated drywall both sides, ready for painting					
Cost per square foot of wall	B1@.068	SF	2.24	2.43	4.67
Cost per running foot, for 8' high walls	B1@.544	LF	17.90	19.40	37.30

**Carpentry, Assemblies**

	<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
2" x 4" stud walls with 5/8" gypsum fire rated drywall one side, ready for painting					
Cost per square foot of wall	B1@.048	SF	1.70	1.71	3.41
Cost per running foot, for 8' high walls	B1@.384	LF	13.60	13.70	27.30
2" x 6" stud walls with 1/2" gypsum drywall both sides, ready for painting					
Cost per square foot of wall	B1@.072	SF	2.71	2.57	5.28
Cost per running foot, for 8' high walls	B1@.576	LF	21.70	20.60	42.30
2" x 6" stud walls with 1/2" gypsum drywall one side, ready for painting					
Cost per square foot of wall	B1@.054	SF	2.21	1.93	4.14
Cost per running foot, for 8' high walls	B1@.432	LF	17.60	15.40	33.00
2" x 6" stud walls with 5/8" gypsum fire rated drywall both sides, ready for painting					
Cost per square foot of wall	B1@.076	SF	2.79	2.71	5.50
Cost per running foot, for 8' high walls	B1@.608	LF	22.30	21.70	44.00
2" x 6" stud walls with 5/8" gypsum fire rated drywall one side, ready for painting					
Cost per square foot of wall	B1@.056	SF	2.25	2.00	4.25
Cost per running foot, for 8' high walls	B1@.448	LF	18.00	16.00	34.00
<b>Exterior wall assemblies</b>					
2" x 4" stud walls with drywall interior, wood siding exterior, 1/2" gypsum drywall inside face ready for painting, over 3-1/2" R-13 insulation with 5/8" thick rough sawn T-1-11 exterior grade plywood siding on the outside face.					
Using 5/8" rough sawn T-1-11 siding at	—	MSF	1,840.00	—	1,840.00
Cost per square foot of wall	B1@.068	SF	4.29	2.43	6.72
Cost per running foot, for 8' high walls	B1@.544	LF	34.30	19.40	53.70
2" x 6" stud walls with drywall interior, wood siding exterior, same construction as above, except with 6-1/4" R-19 insulation					
Cost per square foot of wall	B1@.077	SF	4.96	2.75	7.71
Cost per running foot, for 8' high walls	B1@.616	LF	39.70	22.00	61.70
2" x 4" stud walls with drywall interior, 1/2" gypsum drywall on inside face ready for painting, over 3-1/2" R-11 insulation with 1" x 6" southern yellow pine drop siding, D grade, 1.19 BF per SF at 5-1/4" exposure on the outside face.					
Using D grade yellow pine drop siding at	—	MSF	3,920.00	—	3,920.00
Cost per square foot of wall	B1@.074	SF	6.37	2.64	9.01
Cost per running foot, for 8' high wall	B1@.592	LF	50.90	21.10	72.00
2" x 6" stud walls with drywall interior, 1" x 6" drop siding exterior, same construction as above, except with 6-1/4" R-19 insulation					
Cost per square foot of wall	B1@.083	SF	7.04	2.96	10.00
Cost per running foot, for 8' high wall	B1@.664	LF	56.30	23.70	80.00
2" x 4" stud walls with drywall interior, stucco exterior, 1/2" gypsum drywall on inside face ready for painting, over 3-1/2" R-11 insulation and a three-coat exterior plaster (stucco) finish with integral color on the outside face					
Cost per square foot of wall	B1@.050	SF	5.83	1.78	7.61
Cost per running foot, for 8' high wall	B1@.400	LF	46.60	14.30	60.90
2" x 6" stud walls with drywall interior, stucco exterior, same construction as above, except with 6-1/4" R-19 insulation					
Cost per square foot of wall	B1@.059	SF	6.50	2.11	8.61
Cost per running foot, for 8' high wall	B1@.472	LF	52.00	16.80	68.80
Add for different type gypsum board					
1/2" or 5/8" moisture resistant greenboard	—	SF	.16	—	.16
Cost per SF, greenboard per side, add					
1/2" or 5/8" moisture resistant greenboard	—	LF	1.29	—	1.29
Cost per running foot per side 8' high					
5/8" thick fire rated type X gypsum drywall	—	SF	.14	—	.14
Cost per SF, per side, add					
5/8" thick fire rated type X gypsum drywall	—	LF	1.10	—	1.10
Cost per running foot per side 8' high					

## Carpentry, Assemblies

Craft@Hrs	Unit	Material	Labor	Total
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**Ceiling Assemblies** Costs for wood framed ceiling joists with ceiling finish and fiberglass insulation, based on performing the work at the construction site. These costs include the ceiling joists, ceiling finish as described, blocking, nails and 3-1/2" thick R-13 fiberglass insulation batts between the ceiling joists. Figures in parentheses indicate board feet per square foot of ceiling framing including end joists and typical header joists. No beams included. Ceiling joists and blocking are based on standard and better grade lumber. Costs shown are per square foot of area covered and include normal waste. Deduct for openings over 25 SF.

Ceiling joists with 5/8" regular gypsum drywall taped and sanded smooth finish, ready for paint

Using 2" x 4" at	—	MBF	1,370.00	—	1,370.00
Using 2" x 6" at	—	MBF	1,330.00	—	1,330.00
Using 2" x 8" at	—	MBF	1,250.00	—	1,250.00

2" x 4" ceiling joists at 16" on center (.59 BF per SF), with insulation and 1/2" gypsum drywall      B1@.053      SF      2.59      1.89      4.48

2" x 6" ceiling joists at 16" on center (.88 BF per SF), with insulation and 1/2" gypsum drywall      B1@.055      SF      3.15      1.96      5.11

2" x 8" ceiling joists at 16" on center (1.17 BF per SF), with insulation and 1/2" gypsum drywall      B1@.057      SF      3.60      2.03      5.63

For spray applied plaster finish (sometimes called "popcorn" or "cottage cheese" texture)

Add for ceiling texture      DT@.011      SF      .03      .43      .46

For different type gypsum drywall with taped and sanded smooth finish, ready for paint

5/8" moisture resistant greenboard, add      —      SF      .12      —      .12

5/8" ultralight, add      —      SF      .01      —      .01

5/8" fire rated "C", add      —      SF      .07      —      .07

For different ceiling joist center to center dimensions

2" x 4" ceiling joists  
12" on center, add      B1@.004      SF      .26      .14      .40

20" on center, deduct      —      SF      -.15      -.07      -.22

24" on center, deduct      —      SF      -.23      -.11      -.34

2" x 6" ceiling joists  
12" on center, add      B1@.006      SF      .36      .21      .57

20" on center, deduct      —      SF      -.21      -.07      -.28

24" on center, deduct      —      SF      -.33      -.11      -.44

2" x 8" ceiling joists  
12" on center, add      B1@.006      SF      .45      .21      .66

20" on center, deduct      —      SF      -.26      -.07      -.33

24" on center, deduct      —      SF      -.41      -.11      -.52

For different type insulation

Fiberglass batts  
6-1/4" thick R-19, add      —      SF      -.16      —      -.16

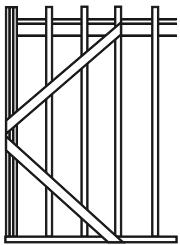
10" thick R-30, add      —      SF      .22      —      .22

Blown-in fiberglass, subcontract  
8" thick R-19, add      —      SF      —      —      .16

**Roofing Assemblies** Costs for wood framed roof assemblies with roof finish material as shown based on performing the work at the construction site. Costs shown include all material and labor required above the top plate or ledger on the supporting walls. These costs assume the supporting wall structure is in-place and suitable for the assembly described.

**Carpentry, Assemblies**

<b>Craft@Hrs</b>	<b>Unit</b>	<b>Material</b>	<b>Labor</b>	<b>Total</b>
<b>Flat roof assembly</b> Based on using 2" x 12" joists Std & Btr grade at 16" on center including blocking, ripped strips and normal waste. The roof surface is built-up 3 ply asphalt consisting of 2 plies of 15 lb. felt hot mopped with a 90 lb. mineral-coated cap sheet.				
Using 2" x 12" joists at	—	MBF	1,500.00	— 1,500.00
Using 2" x 8" joists at	—	MBF	1,250.00	— 1,250.00
Using 1/2" RTD plywood at	—	MSF	1,520.00	— 1,520.00
Using 7/16" OSB at	—	MSF	1,020.00	— 1,020.00
Flat roof assembly as described above				
Framing, with plywood sheathing	B1@5.00	Sq	529.00	178.00 707.00
Framing, with OSB sheathing	B1@5.00	Sq	476.00	178.00 654.00
Built-up roofing, 3-ply and gravel	R1@2.15	Sq	136.00	81.40 217.40
<b>Conventionally framed roof assemblies</b> Based on straight gable type roof (no hips, valleys, or dormers) with 6" in 12" rise or less. Cost per 100 square feet of plan area under the roof, not actual roof surface area. Framing includes 2" x 8" common rafters Std & Btr grade at 24" on center. Cost includes blocking, ridge and normal bracing. Roof sheathing is either 7/16" OSB (oriented strand board) or 1/2" RTD plywood.				
Conventionally framed roof assembly. Select roof finish from below				
Framing, with plywood sheathing	B1@4.10	Sq	303.00	146.00 449.00
Framing, with OSB sheathing	B1@4.10	Sq	251.00	146.00 397.00
Add for built-up 3-ply finish roofing	R1@1.25	Sq	118.00	47.30 165.30
Add for composition shingle (Class C) roofing	R1@1.83	Sq	453.00	69.30 522.30
Add for asphalt shingle (Class A) roofing	R1@1.83	Sq	190.00	69.30 259.30
Framing, with no sheathing	B1@2.80	Sq	144.00	99.90 243.90
Add for 26 gauge steel roofing	R1@2.70	Sq	295.00	102.00 397.00
Add for gable studs				
2" x 4" spaced 16" OC (.54 BF per SF)	B1@.023	SF	.74	.82 1.56
Add for purlins (purling), Std & Btr, installed below roof rafters. Figures in parentheses indicate board feet per LF including 5% waste				
Using 2" x 8" joists at	—	MBF	1,250.00	— 1,250.00
2" x 8" (1.40 BF per LF)	B1@.023	LF	1.75	.82 2.57
<b>Piecework, Rough Carpentry</b> Rough carpentry on residential tracts is usually done by framing subcontractors who bid at piecework rates (such as per square foot of floor). The figures below list typical piecework rates for repetitive framing work and assume all materials are supplied to the framing subcontractor. No figures appear in the Craft@Hrs column because the work is done for a fixed price per square foot and the labor productivity can be expected to vary widely.				
<b>Layout and plating</b> Piecework rates				
Lay out wall plates according to the plans (snap chalk lines for wall plates, mark location for studs, windows, doors and framing details), cut top and bottom plates and install bottom plates. Costs per square foot of floor (excluding garage).				
Custom or more complex jobs	—	SF	—	.28 .28
Larger job, longer runs	—	SF	—	.19 .19
<b>Wall framing</b> Piecework rates				
Measure, cut, fit, assemble, and tip up walls, including studs, plates, cripples, let-in braces, trimmers and blocking. Costs per square foot of floor.				
Complex job, radius walls, rake walls	—	SF	—	.78 .78
Larger job, 8' high walls, fewer partitions	—	SF	—	.28 .28



## Carpentry, Piecework

Craft@Hrs	Unit	Material	Labor	Total
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### **Plumb and align framed walls** Piecework rates

Force walls into alignment. Adjust walls to vertical and install temporary wood braces as needed.

Bracing plates includes shooting powder driven fasteners through wall plates. Based on accuracy to 3/16". Includes re-checking plumb and alignment when framing is done. Costs per square foot of floor.

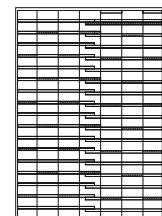
Small or complex job, brace walls and plates	—	SF	—	.25	.25
Larger job, fewer braces, walls only	—	SF	—	.15	.15
Sheathed walls, squared before lifting	—	SF	—	.08	.08

### **Floor joists or ceiling joists** Piecework rates

Lay out, cut and install floor or ceiling joists, including rim joists, doubled joists, straps, joist hangers, blocking at 8' OC and ceiling backing for drywall. Based on larger jobs with simple joist layouts set 16" OC and pre-cut blocking supplied by the general contractor. Add the cost of floor beams, if required.

Costs per square foot of horizontal joist area. More complex jobs with shorter runs may cost 50% more.

2" x 8" ceiling or floor joists	—	SF	—	.22	.22
2" x 10" ceiling or floor joists	—	SF	—	.25	.25
2" x 12" ceiling or floor joists	—	SF	—	.27	.27
2" x 14" ceiling or floor joists	—	SF	—	.32	.32
Add for 12" OC spacing	—	SF	—	.09	.09
Deduct for 20" OC spacing	—	SF	—	-.03	-.03
Deduct for 24" OC spacing	—	SF	—	-.06	-.06

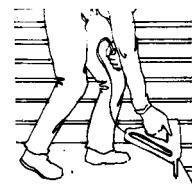


### **Floor sheathing** Piecework rates

Lay out, cut, fit and install 5/8" or 3/4" tongue and groove plywood floor sheathing, including blocking as required. Based on nailing done with a pneumatic nailer and nails supplied by the general contractor.

Costs per square foot of sheathing installed

Smaller, cut-up job	—	SF	—	.25	.25
Larger job, longer runs	—	SF	—	.19	.19
Add for 1-1/8" sheathing	—	SF	—	.08	.08



### **Stair framing** Piecework rates

Lay out, cut, fit and install straight, "U"- or "L"-shaped 30" to 36" wide stairs made from plywood and 2" x 12" stringers set 16" OC. These costs include blocking in the adjacent stud wall and a 1" skirt board.

Costs per 7-1/2" riser. Framing more complex stairs may cost up to \$500 per flight.

Small job, short runs	—	Ea	—	18.30	18.30
Larger job, longer runs	—	Ea	—	13.80	13.80
Add per 3' x 3' landing, including supports	—	Ea	—	47.20	47.20
Add for larger landings, including supports	—	Ea	—	117.00	117.00

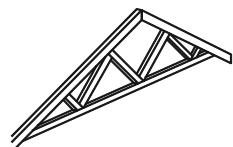
### **Shear panels** Piecework rates

Lay out, cut, fit and install structural 3/8" or 1/2" OSB or plywood wall panels. These figures assume shear studs were set correctly by others and that panel nails are driven at 4" OC with a pneumatic nailer. Not including hold-down straps, posts, shear blocking or extra studs. Costs per 4' x 9' panel installed.

Small job, many openings, 2nd floor	—	Ea	—	12.60	12.60
Larger job, few openings, 1st floor	—	Ea	—	7.81	7.81

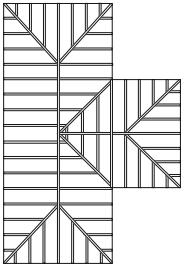
### **Roof trusses** Piecework rates

Setting and nailing engineered gable and hip roof trusses 24" OC on prepared wall plates. These figures assume that lifting equipment is provided by the general contractor and that the truss supplier provides a fill package, spreader blocks for each plate and the ridge and jack rafters (if required). Includes installation of ceiling backing where required and catwalks at the bottom chord. Costs per square foot of plan area under the truss.



Small job assumes multiple California fill between roof surfaces and understacking

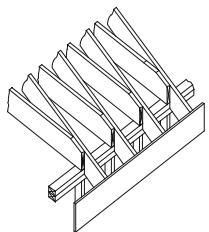
Small job, rake fill above a partition wall	—	SF	—	.68	.68
Larger job, little or no fill or understacking	—	SF	—	.38	.38

**Carpentry, Detailed Breakdown****Conventional roof framing** Piecework rates

Calculate lengths, lay out, cut and install 2" x 10" or 2" x 12" common, hip, valley and jack rafters on parallel and horizontal plates. Costs per square foot of plan area under the roof.

Small job, cut-up roof, few common rafters

	Craft@Hrs	Unit	Material	Labor	Total
Rafters 12" OC	—	SF	—	1.41	1.41
Rafters 16" OC	—	SF	—	1.19	1.19
Rafters 20" OC	—	SF	—	.94	.94
Rafters 24" OC	—	SF	—	.68	.68
Larger job, longer runs, nearly all common rafters					
Rafters 12" OC	—	SF	—	.68	.68
Rafters 16" OC	—	SF	—	.61	.61
Rafters 20" OC	—	SF	—	.47	.47
Rafters 24" OC	—	SF	—	.39	.39
Add for slope over 6 in 12	—	SF	—	.23	.23
Deduct for 2" x 6" or 2" x 8" rafters	—	SF	—	-.08	-.08

**Fascia** Piecework rates

Applied to rafter tails and as a barge rafter on gable ends. Includes trimming the rafter tails to the correct length and installing outlookers at gable ends. Costs per linear foot of 2" x 8" fascia installed.

Small job, short runs, with molding	—	LF	—	3.04	3.04
Larger job, longer runs	—	LF	—	1.75	1.75

**Roof sheathing** Piecework rates

Lay out, cut, fit and install 1/2" or 5/8" OSB or plywood roof sheathing, including blocking and 1" x 8" starter board on overhangs as required. Based on nailing done with a pneumatic nailer and nails supplied by the general contractor. Costs per square foot of sheathing installed.

Smaller, cut-up hip and valley job	—	SF	—	.26	.26
Larger job, longer runs	—	SF	—	.20	.20
Add for slope over 6 in 12	—	SF	—	.13	.13

**Carpentry Cost, Detailed Breakdown** This section is arranged in the order of construction. Material costs shown here can be adjusted to reflect your actual lumber cost: divide your actual lumber cost (per MBF) by the cost listed (per MBF). Then multiply the cost in the material column by this adjustment factor. No waste included

**Lally columns** (Residential adjustable basement column) 7' 9" to 8' 1", steel tube

Column installation, to 12' high	B1@.458	Ea	175.00	16.30	191.30
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**Precast pier blocks** Posts set on precast concrete pier block, including pier block with anchor placed on existing grade, temporary reusable 1" x 6" bracing (8 LF) and stakes (2). Cost is for each post set.

Add for excavation if required

Heights to 8', cost of post not included	BL@.166	Ea	11.10	5.31	16.41
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**Pier pads** 2" x 6", treated, #2 & Btr

Using #2 & Btr treated lumber at 1.10 BF per LF	—	MBF	2,090.00	—	2,090.00
	B1@.034	LF	2.30	1.21	3.51

**Posts** 4" x 4", material costs include 10% waste (1.47 BF per LF). See also Lally columns above and Posts in the Lumber section

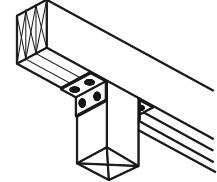
Fir, rough Std & Btr, K.D.	—	MBF	1,770.00	—	1,770.00
Fir, rough Std & Btr, K.D. 4" x 4"	—	LF	2.61	—	2.61
Red cedar, rough green constr.	—	MBF	4,400.00	—	4,400.00
Red cedar, rough green constr.	—	LF	6.47	—	6.47
Redwood, S4S construction heart	—	MBF	3,510.00	—	3,510.00

## Carpentry, Detailed Breakdown

	Craft@Hrs	Unit	Material	Labor	Total
Redwood, S4S construction heart	—	LF	5.16	—	5.16
Southern yellow pine #2, pressure treated	—	MBF	2,110.00	—	2,110.00
Southern yellow pine #2, pressure treated	—	LF	3.10	—	3.10

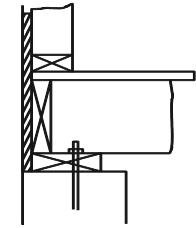
**Girders** Standard and better lumber, first floor work. Figures in parentheses show board feet per linear foot of girder, including 7% waste

4" x 6", per MBF	—	MBF	1,830.00	—	1,830.00
4" x 8", 10", 12", per MBF	—	MBF	1,990.00	—	1,990.00
6" x 6", per MBF	—	MBF	2,870.00	—	2,870.00
6" x 8", 10", 12", 8" x 8", per MBF	—	MBF	2,870.00	—	2,870.00
4" x 6" (2.15 BF per LF)	B1@.034	LF	3.93	1.21	5.14
4" x 8" (2.85 BF per LF)	B1@.045	LF	5.67	1.61	7.28
4" x 10" (3.58 BF per LF)	B1@.057	LF	7.12	2.03	9.15
4" x 12" (4.28 BF per LF)	B1@.067	LF	8.51	2.39	10.90
6" x 6" (3.21 BF per LF)	B1@.051	LF	9.20	1.82	11.02
6" x 8" (4.28 BF per LF)	B1@.067	LF	12.30	2.39	14.69
6" x 10" (5.35 BF per LF)	B1@.083	LF	15.30	2.96	18.26
6" x 12" (6.42 BF per LF)	B1@.098	LF	18.40	3.50	21.90
8" x 8" (5.71 BF per LF)	B1@.088	LF	16.40	3.14	19.54



**Sill plates** (At foundation) SYP #2 pressure treated lumber, drilled and installed with foundation bolts at 48" OC, no bolts, nuts or washers included. See also plates in this section. Figures in parentheses indicate board feet per LF of foundation, including 5% waste and wolmanized treatment.

Sill plates, per MBF	—	MBF	1,680.00	—	1,680.00
2" x 3" (.53 BF per LF)	B1@.020	LF	.67	.71	1.38
2" x 4" (.70 BF per LF)	B1@.023	LF	1.31	.82	2.13
2" x 6" (1.05 BF per LF)	B1@.024	LF	1.55	.86	2.41
2" x 8" (1.40 BF per LF)	B1@.031	LF	2.38	1.11	3.49



**Floor joists** Per SF of area covered. Figures in parentheses indicate board feet per square foot of floor including box or band joist, typical double joists, and 6% waste. No beams, blocking or bridging included. Deduct for openings over 25 SF. Costs shown are based on a job with 1,000 SF of area covered. For scheduling purposes, estimate that a two-man crew can complete 750 SF of area per 8-hour day for 12" center to center framing; 925 SF for 16" OC; 1,100 SF for 20" OC; or 1,250 SF for 24" OC.

### 2" x 6" Std & Btr

2" x 6" floor joists, per MBF	—	MBF	1,330.00	—	1,330.00
12" centers (1.28 BF per SF)	B1@.021	SF	1.70	.75	2.45
16" centers (1.02 BF per SF)	B1@.017	SF	1.35	.61	1.96
20" centers (.88 BF per SF)	B1@.014	SF	1.17	.50	1.67
24" centers (.73 BF per SF)	B1@.012	SF	.97	.43	1.40

### 2" x 8" Std & Btr

2" x 8" floor joists, per MBF	—	MBF	1,250.00	—	1,250.00
12" centers (1.71 BF per SF)	B1@.023	SF	2.13	.82	2.95
16" centers (1.36 BF per SF)	B1@.018	SF	1.70	.64	2.34
20" centers (1.17 BF per SF)	B1@.015	SF	1.46	.54	2.00
24" centers (1.03 BF per SF)	B1@.013	SF	1.28	.46	1.74

### 2" x 10" Std & Btr

2" x 10" floor joists, per MBF	—	MBF	1,310.00	—	1,310.00
12" centers (2.14 BF per SF)	B1@.025	SF	2.79	.89	3.68
16" centers (1.71 BF per SF)	B1@.020	SF	2.23	.71	2.94
20" centers (1.48 BF per SF)	B1@.016	SF	1.93	.57	2.50
24" centers (1.30 BF per SF)	B1@.014	SF	1.70	.50	2.20

## Carpentry, Detailed Breakdown

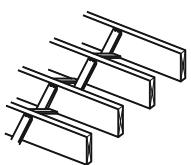
	Craft@Hrs	Unit	Material	Labor	Total
2" x 12" Std & Btr					
2" x 12" floor joists, per MBF	—	MBF	1,500.00	—	1,500.00
12" centers (2.56 BF per SF)	B1@.026	SF	3.84	.93	4.77
16" centers (2.05 BF per SF)	B1@.021	SF	3.07	.75	3.82
20" centers (1.77 BF per SF)	B1@.017	SF	2.65	.61	3.26
24" centers (1.56 BF per SF)	B1@.015	SF	2.34	.54	2.88

**Floor joist wood, TJI truss type** Suitable for residential use, 50 PSF floor load design. Costs shown are per square foot (SF) of floor area, based on joists at 16" OC, for a job with 1,000 SF of floor area. Figure 1.22 SF of floor area for each LF of joist. Add the cost of beams, supports and blocking. For scheduling purposes, estimate that a two-man crew can install 900 to 950 SF of joists in an 8-hour day.

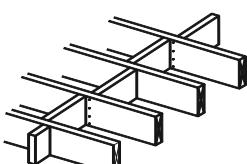
9-1/2" TJI/15	B1@.017	SF	4.25	.61	4.86
11-7/8" TJI/15	B1@.017	SF	4.66	.61	5.27
14" TJI/35	B1@.018	SF	6.80	.64	7.44
16" TJI/35	B1@.018	SF	7.40	.64	8.04

**Bridging or blocking** Installed between 2" x 6" thru 2" x 12" joists. Costs shown are per each set of cross bridges or per each block for solid bridging, and include normal waste. The spacing between the bridging or blocking, sometimes called a "bay," depends on job requirements. Labor costs assume bridging is cut to size on site.

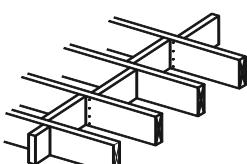
1" x 4" cross					
Joist bridging, per MBF	—	MBF	2,250.00	—	2,250.00
Joists on 12" centers	B1@.034	Ea	1.12	1.21	2.33
Joists on 16" centers	B1@.034	Ea	1.53	1.21	2.74
Joists on 20" centers	B1@.034	Ea	1.95	1.21	3.16
Joists on 24" centers	B1@.034	Ea	2.36	1.21	3.57



2" x 6" solid, Std & Btr					
2" x 6" blocking, per MBF	—	MBF	1,330.00	—	1,330.00
Joists on 12" centers	B1@.042	Ea	1.46	1.50	2.96
Joists on 16" centers	B1@.042	Ea	1.95	1.50	3.45
Joists on 20" centers	B1@.042	Ea	2.43	1.50	3.93
Joists on 24" centers	B1@.042	Ea	2.92	1.50	4.42



2" x 8" solid, Std & Btr					
2" x 8" blocking, per MBF	—	MBF	1,250.00	—	1,250.00
Joists on 12" centers	B1@.042	Ea	1.83	1.50	3.33
Joists on 16" centers	B1@.042	Ea	2.44	1.50	3.94
Joists on 20" centers	B1@.042	Ea	3.05	1.50	4.55
Joists on 24" centers	B1@.042	Ea	3.66	1.50	5.16



2" x 10" solid, Std & Btr					
2" x 10" blocking, per MBF	—	MBF	1,310.00	—	1,310.00
Joists on 12" centers	B1@.057	Ea	2.39	2.03	4.42
Joists on 16" centers	B1@.057	Ea	3.19	2.03	5.22
Joists on 20" centers	B1@.057	Ea	3.99	2.03	6.02
Joists on 24" centers	B1@.057	Ea	4.79	2.03	6.82

# Index

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## A

Abbreviations	6	design fees	134	window	177	Anchors
Abrasion testing	314	engineering	134	wiring	128	chimney
Abrasive		partitions	443	Air curtain heaters	536	concrete
anti-skid strip	283	privacy testing	134	Air curtains	417	conduit hanger
concrete finish	356	tile, demolition	100, 336	Air eliminator vent	538	embedded steel
stair treads	220, 432	ACQ-compatible flashing	268, 270	Air eliminator-purger	173	foundation
terrazzo	433	ACQ-treated lumber	201	Air exhausters		masonry
ABS		Acrylon wall cover	444	exhaust hood	455	timber connectors
bungalow fitting	514	Acrylic		fans	142, 407	Andersen
bushing	516	clear panels	80	Air filter system, central	176	Andersen windows
cap	516	diffusers	80, 583	Air hammer	596	Angle
cleanout adapter	516	latex caulk	77	Air handler, residential	179	bracket
cleanout tee	515	tub and shower	533	Air hose		clips
closet flange	515	waterproofing	184	reel	449	flashing
coupling	513	Acrylic-urethane foam roof	401	rental	320	iron
double sanitary tee	514	Actuating devices,		Air tool operator wage	309	iron, fireplace
double wye	514	garage doors	164	Air tools		sill, steel
elbow	513	ACZA treatment, lumber	206	earthwork	138	stops
female adapter	515	ADA		pneumatic	103	supports, pipe
floor drains	516	handicapped access	476	rental	320	valves
male adapter	515	signage	442	Airless paint sprayer	239	Anodizing
P-trap	516	Adapters		Alarm		Antenna
return bend	516	ABS cleanout	516	access	434	cable
sanitary tee	514	ABS female	515	circuit	542	remote high gain
soil pipe adapter	516	ABS male	515	systems	589, 591	Anti-siphon vacuum breakers
test cap	515	ABS soil pipe	516	systems, electrical work	128	Anti-skid strips
test tee	515	ABS trap	516	valves	492	Appliance dolly, rental
trap adapter	516	copper	504	wiring	128, 264	Appliances
wye	514	CPVC	508	Alarms		cabinets
ABS-DWV pipe	512	drain pipe	126	fire	264	connections
cleanout plug	516	DWV trap	512	security	264	dishwashers
Absorption testing	314	polyethylene pipe	621	smoke	264	garbage disposers
Accent lights, LED	584	Additives		Alcohol paint thinner	238	ranges
Access		coloring	85, 218, 350, 356	Aliphatic resin glue	18	rough-in
control units	590	concrete	85, 350, 356	All-season storm doors	114	solar water heaters
disabled persons	476	Add-on boiler modules	578	Altars	462	water heaters
fitting, PVC	550	Address systems, public	592	Aluminum		water softeners
flooring	434	Adhesives	17	blinds	296	wiring
handicapped	476	acoustical ceiling tile	429	breaks, rental	329	Appraisal fees
hatches, sheet metal	266	ceramic tile	18, 428	cladding	400	Apprentice costs included
stairs, folding	284	flooring	18, 154, 159	coating	257	Apron
Access doors		modified bitumen	258	concrete-imbedded	482	concrete driveway
attic	266	permanent bond	258	conduit	552	window
foundation	291	roofing	256, 258	cupola roof	97	Arbitration
louver	253, 525	tile	288, 289	curtain wall	419	fees
plumbing	253, 525	wallpaper	293	downspouts	404	mobile
sheet metal	266	wood flooring	159	fence	149	Archaid
steel	418	Administrative overhead	208	flagpoles	448	Archbead
tub	266	Admixtures		flashing	267, 403	Architectural
wall	266	coloring	85, 218, 356	foil insulation	183	drawings
Access points, wireless	130, 460	concrete	85, 350, 356	gutters	404	form lining
Access ramps	476	Adobe block	216	letters	441	screens
Accessories		Aerators, rental	327	louvers	.80	shingles
glass block	217	Aerial		metal work	388	signage
water heater	526	equipment rental	324	ornamental	388	Area lighting
Accordion		mapping	313	oxide	356	Area modification factors
doors	417	photographs	313	patio doors	121	how to use
Accordion folding doors	443	platform rental	324	pet doors	122	Area walls, sheet metal
Accordion folding partitions	443	Aggregate	18, 94	railing	386	Arks, church
Acetone	238	base	84	roofing	400	Armed guard
Acid cleaning		exposed, concrete	615	sheet	403	Armstrong
concrete	356	finish	356	siding	276, 400	ceiling tile
etching	466	paving	609	stairs	282	flooring
masonry	371	pea gravel	18	tile	429	vent
wash	371	roofing	256	Arquati Roma awnings	471	containment
Acid etching	437	sand	18	Arrow board, rental	326	pipe insulation removal
Acid-proof brick	375	seeded	244	Art glass, ecclesiastical	470	removal
Acid-resistant countertops	473	testing	314	Asbestos		testing
Acoustical		Air compressor		containment	338	Asbestos worker, wage
adhesive	18	rental	139, 320	pipe insulation removal	338	309
block	380	service station	449	removal	338	
ceiling panels	81	Air conditioning	180	testing	26	
		heat pump	178	tilt-up	361, 363	
		residential	180			

As-built drawings.....	126	Auditorium	452	rough-in.....	531
Ash		acoustic design fees.....	134	seat.....	25
drop.....	151	seating.....	474	walk-in.....	246
dumps.....	151	Auger holes	608	whirlpool tub.....	245
flooring.....	155	caissons.....	608	Battens, lumber.....	222
urns.....	473	post holes.....	617	Batterboards.....	189
Ash wood flooring.....	155, 158	Augers	327	Batts, insulation.....	181, 397
Ashtray.....	473	rental.....	327	Bay vent channel.....	292
Asphalt		toilet, rental.....	328	Bay window.....	299
access road.....	610	Auto hoist.....	450	roof cover.....	304
built-up roofing.....	256	Automatic gates.....	165	Bead	
coatings.....	256	Awning	21	lath.....	426
cold milling.....	611	roll-up.....	21	lath & plaster.....	188
curb.....	610	Awning windows	21	molding.....	223, 226
dampproofing.....	397	aluminum.....	302	Beadex.....	169
emulsion.....	381	vinyl-clad wood.....	300	Beam clamps, piping.....	517
felt.....	27, 401	Awnings.....	21	Beams	
milling.....	611	canopy-type.....	472	applied.....	54
mix.....	82	commercial.....	471	carpentry.....	390
paper.....	258	fabric.....	21	ceiling.....	45
parking lot.....	610	lean-to type.....	471	clamps, conduit.....	554
paving.....	243, 609	motorized.....	471	collar.....	48
paving, demolition.....	102	B		concrete.....	339, 345
primer.....	466	Baby changing stations.....	447	formwork.....	339, 345
recycling.....	332	Backbar.....	457	grade.....	93
repair.....	611	Backboard, plywood.....	460	laminated timbers.....	396
roll sheathing.....	27	Backer board		log.....	193
roof coating.....	237	gypsum drywall.....	168	lumber.....	201
roofing.....	257	tile.....	290	LVL.....	396
sawing.....	371	Backer rod.....	612	precast.....	359
sheathing.....	182	Backer strip, steel framing.....	70	ridge.....	193
slurry seal.....	611	Backfill		shoring.....	345
speed bumps.....	610	concrete excavation.....	339	steel.....	383
tack coat.....	610	earthwork.....	136	steel collar.....	72
walks.....	615	tilt-up.....	361	Bearing capacity test.....	279
waterproofing.....	397	trench.....	598, 619	Bearing ratio, soil testing.....	317
Asphalt cutters, rental.....	320	Backflow		Bed bumpers.....	444
Asphalt-fiberglass shingles.....	258	preventers.....	522, 619, 627	Bed molding.....	224, 226
Asphaltic concrete testing.....	315	valves.....	312	Beds, concealed.....	25
Assemblies		Backhoes		Beehive climber.....	467
brick wall.....	209, 373	excavation.....	137, 599	Beehive grate.....	636
ceiling.....	36	rental.....	138, 322	Bell footings.....	609
floor.....	33	trenching.....	597	Bell wire.....	105
floor slab.....	352	Backing		Bell wiring, electrical work.....	128
framing, door opening.....	43	carpentry.....	47	Bells	
framing, window openings.....	44, 67	clay tile.....	374	door.....	105
interior walls.....	34, 57	finish carpentry.....	51	fire alarm.....	591
plumbing.....	530, 532	rods.....	411	Belt conveyors.....	491
ramps, landings, for handicapped.....	476	steel framing.....	70	Benches	
roof.....	36	Backsplash.....	96	athletic.....	466
roofing.....	37	Backstops		bus stop.....	479
steel framing, door opening.....	66	basketball.....	464	church.....	460
steel framing, window opening.....	66	Backstops, baseball.....	618	locker room.....	474
wall.....	34, 57	Balance beams.....	467	park.....	474
wall, brick.....	209, 373	Balancing valves.....	173, 539	stadium.....	474
Astragal molding.....		Ball cleaning sewer mains.....	630	Benderboard.....	187
.....	108, 223, 413, 421	Ball valves.....	522	Benefits, fringe.....	309
Astro dial time switch.....	564	Ballista range hood.....	254	Bentonite	
Athletic		Balusters.....	281	granules.....	355
benches.....	466	painting.....	240, 438	waterproofing.....	294
court, striping.....	467	stair.....	56	Bevel siding.....	199
court, surface prep.....	466	Bamboo		Beveled glass doors.....	107
equipment.....	465	baseboard.....	157	Beverage dispenser.....	458
equipment, swimming pools.....	475	flooring.....	157	Bicycle racks.....	475
field marker.....	218	stair nose.....	158	Bidets.....	247
fields.....	465	threshold.....	158	Bi-fold doors.....	124, 125
gym equipment.....	464	Band molding.....	222	hardware.....	125
ATM machine.....	453	Band saws, rental.....	328	mirrored.....	125
Attachments, crane, rental.....	322	Bank equipment.....	452	Bike post bollard.....	475
Attic		Bar		Bin, trash.....	332
access doors.....	266	doors.....	118	Birch	
fans.....	128	sinks.....	247	doors.....	115, 116
fans, belt drive.....	141	Barbed wire fence.....	144	paneling.....	242
gable vents.....	142	Barracks, manufactured.....	480	plywood.....	203
stairs, folding.....	284	Barricade		Bird screen.....	406
vents.....	291	highway.....	615	Birdstop.....	262
Audio		lights.....	22	Bitumen adhesive, modified.....	258
detectors.....	264	rental.....	22	Bituminous	
sensors.....	589	roadway.....	22	paving.....	243, 611
Audio-visual equipment, school.....	458	temporary enclosures.....	331	paving, removal.....	332
				roofing.....	256, 401

Black steel pipe.....	494	Bonds, insurance.....	185	Bricklayer, wage industrial & commercial.....	309	Bus schedule, display panel....	480
Blanket insulation.....	183	Bookcases, painting.....	241	residential.....	10	Bus stop enclosures.....	479
Blasting		Boomlifts, rental.....	324	Bricklayer's helper, wage residential.....	10	shelters.....	479
excavation.....	595	Boring		Bridge, pedestrian.....	487	Bushings	
sand.....	371	caissons.....	608	ABS.....	516	ABS.....	
water.....	239, 263, 333, 371, 437	soil testing.....	279	conduit.....	543	conduit.....	
Bleachers.....	464, 474	under walkways.....	619	Business overhead.....	208	Business overhead.....	
Blinds		Bottom plates, carpentry.....	37	Butacite.....	482	Butt weld joints, welding.....	389
aluminum.....	296	Bottom track, steel framing.....	73	Butt hinges.....	420	Butyl roof coating.....	402
cellular.....	297	Bow windows.....	304	Butyl roofing.....	401	BX cable.....	560
PVC.....	296	Box nails.....	227	Brown coat plaster.....	244, 427	Bypass doors.....	123
roll-up.....	296	Boxes		Brush		accessories.....	124
Venetian.....	296	electrical.....	561	chippers, rental.....	327	beveled mirror.....	123
vertical.....	296	junction.....	563	cutters, rental.....	327	mirrored.....	123, 124
Block		outlet.....	128, 561	removal.....	137, 594	C	
adobe.....	216	pull.....	562	Brush finish, concrete.....	95	Cabinets	
concrete.....	213, 378	switch.....	128	Brush painting.....	436	bath.....	220, 290, 446
core fill.....	213, 378	valve.....	619	Bucket truck.....		classroom.....	473
demolition.....	335	Braces		rental.....	324	cleaning.....	83
detailed concrete.....	213, 378	bulkheads.....	605	Bucket, clamshell, rental.....	322	custom.....	472
filler, acrylic.....	237	carpentry.....	44, 390	Buckets, rental.....	321	end panels.....	31
flooring.....	158	steel framing.....	67	Buggies, rental.....	321	extinguisher.....	493
glass building.....	217	temporary.....	44, 67	Builder's adhesive.....	17	finish carpentry.....	473
masonry.....	213, 378	trenches.....	605	Builder's hardware.....	421	fire hose.....	493
painting.....	240, 438	trenches, rental.....	323	rough carpentry.....	159	hardware.....	420, 472
pier.....	39	Brads, nails.....	229	Building		hospital.....	473
sawing.....	370	Braille signage.....	442	appraisal.....	18	installation.....	55
walls, concrete.....	213	elevator.....	479	blocks, concrete filled.....	87	kitchen.....	29
Block filler, painting.....	438	Branch circuits.....	573	board.....	293, 398	labor cost.....	31
Blocking		Brass		columns.....	186	laboratory.....	473
carpentry.....	389	fabrications.....	388	demolition.....	103, 334	lavatory.....	290
finish carpentry.....	51	railing.....	386	hardware.....	421	lighting fixtures.....	191, 221
fireblocks.....	45	storm.....	114	moving.....	338	linen, shelving.....	270
sheathing.....	392	Bread slicer.....	456	paper.....	27, 28	medicine.....	220, 290, 446
steel floor joists.....	62	Breaker		permit fees.....	28	metal.....	472
Blockout forms		bond.....	355	posts, steel.....	186	painting.....	241
cast-in-place slabs.....	341	circuit.....	128	sewer.....	266	shelving.....	270
tilt-up.....	361	form.....	355	stone, testing.....	316	shop.....	472
Blockouts, concrete.....	342	panels.....	571, 572	wiring.....	127	shower.....	533
Blood storage refrigerators.....	469	paving, rental.....	820	Building laborer, wage		storage.....	473
Blowers		vacuum.....	312, 618	industrial & commercial.....	309	utility.....	30, 31
exhaust hood.....	455	Breaking, demolition.....	104, 334	residential.....	10	vanity.....	290
fans.....	142	Brewer, coffee.....	458	Building layout.....	595	wardrobe.....	458, 472, 473
fireplace.....	152	Brick		Buildings		wood.....	473
heating.....	535	acid-proof.....	375	steel engineered.....	483	Cable	
Blown-in insulation.....	183, 398	artificial.....	243	temporary, rental.....	330	antenna.....	130
Blue Board insulation.....	181	chemical-resistant.....	375	Built-in ovens.....	255	armored.....	560
Bluegrass seeding.....	624	cleaning.....	371	Built-up girders		BX.....	560
Blueprinting.....	25	Colonial.....	209	carpentry.....	40	Cat 5.....	593
Boards		commercial.....	210	steel.....	383	Cat 5e.....	593
forming.....	88	common.....	374	Built-up roofing.....	256, 401	Cat 6.....	593
lumber.....	194, 196-198	cutting.....	370	cement, Cold-Ap.....	258	coaxial.....	592
sheathing.....	62	demolition.....	100	demolition.....	102	communication.....	591
treatment.....	206	face brick.....	374	Bulb, light.....	192	computer network.....	593
Board-up		firebrick.....	212	Bulkhead forms.....	340, 342	electrical.....	561
window.....	274	flooring.....	220	Bulkheads, shoring.....	605	Ethernet.....	593
Bobcats, rental.....	323	jumbo.....	210	Bulldozers		fiber optic.....	592
Boilermaker, wage.....	309	manhole.....	637	excavation.....	137	flexible armored.....	560
Boilers.....	578	masonry.....	209, 374	rental.....	138	ice melting.....	561
expansion tank.....	173	mini.....	211	Bullet resistant glass.....	422	metal-clad.....	560
foundations.....	366	mission.....	212	Bulletin boards.....	441	network.....	130, 459, 460
modules.....	578	modular.....	209, 210	Bullnose		phone.....	591
Bollards		mold flashing.....	268	drywall.....	169	power.....	560
bicycle.....	475	molding.....	108, 222	paver.....	212	punch down.....	460
cast iron.....	616	mortar.....	209	Bumper guards.....	444	RG Series.....	592
granite.....	616	Norman.....	209, 210	Bumper threshold.....	285	RJ Series.....	592
Bolt cutters, rental.....	328	Padre.....	210	Bumpers		Romex.....	127, 542, 559
Bolts		painting.....	240	dock.....	365, 451	signal.....	592
anchor.....	59	paving.....	215, 243, 382, 612	highway.....	615	snow-melting.....	476, 561
carriage.....	232	plate.....	382	Bumps, speed.....	610, 617	tap.....	591
foundation.....	159	pointing.....	371	Bungalow fittings, ABS.....	514	testing, computer.....	594
lag.....	232	sandblasting.....	263	Burlap soil stabilization.....	603	tray.....	557
machine.....	232	sawing.....	370	Bus duct connection.....	571	twinaxial.....	593
tilt-up.....	361	standard.....	209, 210	twisted pair.....	593		
Bond breaker.....	355	steps.....	382				
tilt-up.....	363	testing.....	316				
Bonding agents		veneer.....	211				
adhesives.....	17, 18	walls.....	209, 373				
flooring.....	154						
roofing.....	256, 402						

Cable Panel.....	130	Cases	Ceilings	Check valves.....	492, 519, 521
Cable testing.....	130, 460	cabinets.....	acoustical.....	Checkroom equipment.....	453
Cabs, elevator.....	133, 490	laboratory.....	drop.....	Chemical fire protection.....	455
Café doors.....	118	painting.....	plywood.....	Chemical-resistant brick.....	375
Caissons.....	608	Cash box, service station.....	stained glass look.....	Cherry	
Calcimine removal.....	439	Cash dispenser.....	suspended.....	paneling.....	242
Calcium chloride.....	85, 350	Cashing	tin.....	parquet.....	158
Calcium nitrate.....	623	aluminum siding.....	wood strip.....	Chestnut flooring.....	155, 156
California B.A.C.T.....	579	beads.....	Cellar doors	Child protection seat.....	447
California Code 2010.....	579, 581	door.....	steel.....	Chilled water pipe.....	494
California pavers.....	212	extruded polymer.....	23	Chimes, door.....	105
Cambria countertop.....	96	finish carpentry.....	297	wiring.....	128
Campus network wiring.....	459	hardwood.....	Cellulose insulation.....	Chimneys	
Cane fiber joint.....	355	MDF.....	183	anchors.....	151
Canopy		molding.....	Cement.....	caps.....	291
commercial.....	471	nails.....	adhesive.....	firebrick.....	212
door.....	21	window.....	cold process.....	fireplace.....	152
door or window.....	21	Cast iron	coloring.....	flashing.....	404
food service hoods.....	455	column bases.....	concrete.....	flues.....	152, 216, 374
range hoods.....	253	fittings.....	cutting.....	masonry.....	220, 374
steel framing.....	387	flanged pipe.....	duct, envelopes.....	prefabricated.....	374
Canopy lights.....	587	ornamental iron.....	lap roof.....	Chippers	
Cant strips		pipe.....	painting.....	pneumatic, rental.....	320
carpentry.....	50	sections.....	parging.....	rental.....	327
roofing.....	182, 403	valve box.....	plaster.....	Chisels, rental.....	320
Canvas tarpaulins.....	285	valves, AWWA.....	roofing.....	Chop saws, rental.....	328
Cap		Cast-in-place, concrete.....	testing.....	Church	
conduit.....	544	Catch basins.....	tile.....	acoustical design fees.....	134
door bottom.....	286	demolition.....	white.....	chairs.....	461
sheet, roofing.....	257	entrance.....	82, 427, 433	equipment.....	460
test.....	515	gratings.....	Cement and EPS forms.....	glass.....	470
tile.....	374	Catwalks, carpentry.....	87	pews.....	461
Capillary fill.....	339	Caulk.....	Cement mason, wage	Chutes	
Capital forms.....	343	acrylic latex.....	industrial & commercial.....	demolition.....	337
Caps		fireproof.....	residential.....	garbage.....	491
ABS.....	516	guns.....	Central	linen.....	491
black steel.....	494	sealants.....	air filter.....	mail.....	447
copper.....	504	strip.....	heating and cooling.....	trash.....	337
CPVC.....	507	Caution lights.....	Central vacuum systems.....	Cigarette disposal.....	473
drain pipe.....	126	Caution tape.....	backer board.....	Cinder rock.....	604
flashing.....	403	Cavity wall	demolition.....	Circline lighting.....	191
masonry.....	213, 216	insulation.....	facing tile.....	Circuit balancing	
molding.....	222	reinforcing.....	fixtures.....	values.....	173, 539
post.....	163	C-clamps, pipe.....	installation.....	Circuit breakers	
Cappuccino dispenser.....	458	Cedar	mosaic.....	panels.....	575
Carbon steel pipe.....	494	boards.....	veneer.....	wiring for.....	128
Carborundum rub.....	95, 356	closet lining.....	Cesspools, septic tanks.....	Circuits	
Card reader		fence.....	265	dryer.....	543
parking.....	450	lumber.....	CFL light bulb.....	exit light.....	542
security access.....	590	paneling.....	Chain hoists, rental.....	light and power.....	542
Carpenter, wage		plywood.....	Chain link fence.....	motor.....	566
industrial & commercial.....	309	roofing.....	demolition.....	range.....	543
residential.....	10	saunas.....	painting.....	receptacle.....	542
Carpentry		shakes.....	Chain railing.....	switch.....	542
assemblies.....	37	shingles.....	Chain saws.....	under slab.....	542
cabinets.....	29, 473	siding.....	139	Circular louver.....	292
finish.....	51, 52, 421	Cedarmill.....	rental.....	Circular windows.....	299
furring.....	52	Ceiling	55, 223	City cost adjustments.....	12-15
industrial and commercial.....	389	access hatches.....	MDF.....	Civil engineering fees.....	134
molding.....	226	adhesive.....	226	Cladding, preformed.....	400
piecework.....	37	assemblies, wood framed.....	Chairs	Clamps	
piecework rates.....	39, 74	beams.....	auditorium.....	column forms.....	355
plates.....	390	beams, carpentry.....	cathedral.....	concrete, rental.....	322
rough.....	46	demolition.....	reinforcing steel.....	conduit.....	555
square foot costs.....	32	domes.....	school.....	ground rod.....	566
wall sheathing.....	394	fans.....	458	pipe.....	517, 518
Carpet adhesive.....	18	fans, bath.....	Changes in costs.....	PVC conduit.....	551
Carpet tile.....	434	grid.....	5	riser.....	517
Carpets.....	433	joists.....	Changing stations.....	top beam.....	517
access flooring.....	434	joists, steel.....	447	Clamshell excavators, rental.....	322
mats.....	220, 474	lighting fixtures.....	Channel	Clamshovels, rental.....	327
subcontract.....	76	materials.....	hanger.....	Classrooms, manufactured.....	480
Carports.....	77	metal pans.....	hat.....	Clay	
Carriage bolts.....	232	paint removal.....	219	backing tile.....	374
Carriers, conveyors.....	491	painting.....	resilient.....	brick.....	373
Cars, elevator.....	133, 490	238, 241, 437	169, 425	pipe.....	635
Cartridge fuses.....	575	panels.....	siding.....	tile, load bearing.....	374
Carved doors.....	107	radiant heating systems.....	199	Clay tile roofing	
Casement windows		skylights.....	steel.....	demolition.....	102
vinyl.....	299	tile.....	215	Clean metal primer.....	236
vinyl-clad wood.....	300, 301	tile adhesives.....	strap.....		
		tile, wood fiber.....	555		
		treatments.....	vent, rafter bay.....		
			292		
			Channelizing, earthwork.....		
			603		
			Charbroiler, commercial.....		
			455		
			Charging, electric fence.....		
			144		
			Check desks.....		
			452		

Cleaning	
brick	371
cabinets	83
concrete	356
doors	83
final	83
floors	83
glass	83, 331
glass block	381
masonry	371, 372
new construction	83, 331
paint preparation	239
painting	436
pavement joints	612
plumbing fixtures	83
sewer main	630
shower stalls	83
stone	371
storm sewer	631
terra cotta	371
vacuum systems	290
walls	83
windows	83
Cleaning station	457
Cleanout	
adapter, ABS	516
doors, fireplace	151
drainage piping	525
plug, ABS-DWV	516
tees, ABS	515
Cleanup, overhead	310
Clear cedar siding	199
Clearing	
brush	594
excavation	136
Clerical help cost	310
Clevis hangers	517
Climber, tower	469
Clips	
angle	159
framing	159
plywood	162
Clock	
receptacles	563
wiring	128
Closers, door	105, 420
Closet doors	119
bi-fold	124
bypass	123
mirrored bypass	123, 124
Closet flange, ABS	515
Closets	
cabinets	29, 473
lighting, wiring	128
lining, cedar	79
poles	55
racks	453
shelves	270
storage unit	55
water	247, 530, 532
Clothes chutes	491
Clothes dryers	
vent sets	291
wiring	128
Clothes washers, wiring	128
Clothesline units	84
Coat hooks and racks	453
Coatings	
cementitious	369
concrete finishes	356
deck	437
industrial	436
roofing	256
steel	387
Coaxial cable	592
Code caps	291
Coffee brewer/percolator	458
Coil	
framing nails	229
roofing nails	230
Cold box, insulation	399
Cold milling, asphalt	611
Cold process cement	258
Cold-formed steel framing	56
Collar beams	
carpentry	48
steel framing	72
Collar ties	48
Collated brads	229
Collated nails	229, 230
Colonial	
brick	209
columns	84
interior doors	119
storm doors	114
Color coat, tennis court	466
Coloring agents	218
concrete	85, 95, 350, 357
mortar	218, 613
Column forms	342
capitals	344
round	344
tilt-up	365
Columns	
base ties	160
bases	84
capitals, formwork	344
caps	160
carpentry	39
carpentry, steel	58
clamps, rental	322
colonial	134
concrete	340
fireproofing	409
footings	94
lally	39
lally, steel	58
marble	381
painting	240
porch	84
precast	359
reinforcing	349
structural steel	384
tilt-up	365
tube	354
wood	84
Come-a-longs, rental	329
Commercial brick	210
Commercial wage rates	309
Common brick	374
Communications	589
Communications cable	591
Communion rail	461
Compacting soil	
embankment	597
equipment rental	139, 321
excavation	136, 597
roadway	603
trenches	599
Compaction testing	279
Compactors, rental	139, 321
Compartments, cubicles	442
Composite	
doors	119
Composite lumber	98
Composition	
roof, coating for	237
roofing	258
Compressors	
foundations	366
paint	239
rental	320
service station	449
Computer	
access flooring	434
network cable	592, 593
network setup	130, 131
wiring	130
wiring for educational network	459
Concrete	84, 338, 350
access ramps	476
additives	85, 350, 355, 356
adhesive	18
aggregate	350
apron	476, 615
architectural	85
beams	339, 345
block core fill	213, 378
buggies, rental	321
building walls	351
bush hammered	356
caisson	608
cast-in-place	354
coatings	355, 356, 369
coloring	85, 96, 218, 356, 357
column forms	340
columns, reinforcing	349
conduit envelopes	541
core drilling	370
culvert, precast	633
curb	88, 95, 614
curing	356
curing compounds	351
curing papers	28
cutting	370
decking	369
delivery charges	85
demolition	101
depression forms	341
driveways	84
edge forms	340
embossed finish	96
equipment foundations	366
equipment rental	321
etching	357
excavation	338
expansion joints	85, 355
exposed aggregate	95
fiber mesh reinforcing	85
fill	365
fill, columns	384
finishes	95
finishing	96
fireproofing	407
flared apron	476, 615
flatwork	352, 611
floor finishes	356, 369
floor slab	352
footings	94
footings, demolition	100
form stakes	86
form stripping	88
form tie	355
forms	86, 87, 88, 93, 339
forms, cast-in-place	340
forms, paving	611
foundations	93
grade beams	93
granite aggregate	85
grout	355, 378
grout mix	85
grouting	96
gunite	357
hardeners	356
headwalls	638
high early strength	85
ICF	86
inserts	355
insulated forms	86, 87
insulating deck	369
joints	85
keyway	93
labor placing	351
landings	476
lightweight	85
line markings	616
lintels	382
manholes	636
masonry units	213, 378
meter boxes	221
mix	84
mixer, rental	321
nails	230
paint preparation	239
paint removal	234
painting	240, 437
patching	95
pavers	215, 613
paving	244, 611
paving, removal	332
piles	606
pipe	633
placing	95, 351
plank	358
plasticized	85
plyform	203
pouring	95
precast	221, 357
pull & junction box	542
pump mix	85
pumping	350
ready-mix	84, 350, 351
recycling	332
reinforcement	89, 346
retaining walls	92, 341
roof decks	369
sandblasting	263
sawing	362, 370
saws, rental	321
screebs, rental	322
sealant	77
sealer	356
shingles	261
sidewalk	94, 615
slab demolition	336
slab forms	340
slab sawing	370
slabs	94, 352, 354, 359, 369
slip-formed	353
snap ties	86
specialty finishes	95
spread footings	377
stain	235
stairways	354
stamped finish	96
stamped, subcontract	369
steps	95, 351, 354
steps-on-grade	95
structural	351, 353
support poles	360
surface prep	437
surfacing	369
suspended slabs	353
testing	315
ties	86
tile	261
tile roofing	261
tilt-up	362
topping	95
underpinning	605
unit masonry	213
vapor barrier	430
vibrators, rental	321
walks	94, 615
wall form	88
wall sawing	370
walls	86, 87, 92, 351, 357
waterproofing	294, 355, 397
waterstop	91, 349
wedge tie	355
work	338
Concrete block	
demolition	100
glazed	379
natural	213
painting	240, 241, 438
pavers	215
retaining walls	375
screen	215, 380
slump	216
split-face	215, 379
testing	316
walls	213, 378
Concrete reinforcing	
polypropylene fiber	85
Concrete tile roofing	
demolition	102
Conduit	
adapter, PVC	550
bodies, PVC	550
bodies, steel	543
clamps	555
EMT	544
EMT circuits	547

end bell	549	Coping	Cover	Cupboards, painting	241
flexible aluminum	552	masonry	plywood	Cupolas	97
flexible non-metallic	553	metal	216, 382	weather vanes	97
flexible steel	552	Co-polymer shutters	403	Curb inlet protection	604
hangers	554	Copper	272	Curbing machine rental	325
hangers, PVC	551	flashing	272, 403	Curbs	
hubs	569	grounding devices	267, 403	asphalt	610
IMC	548	gutter	565	concrete	88, 95, 614
intermediate metal	548	nails	405	demolition	101, 332
lightweight	553	pipe	267	elevated slabs	345
liquid-tight flexible metal	553	DWV	503	for handicapped	478
painting	437	pressure fittings	512	granite	614
PVC	548	roof, cupola	504	inlets	637
rigid steel	543	roofing	97	Curing concrete	356, 362
RSC	543	tubing	404	Curing papers	28
steel	543	wall ties	505, 512	Curtain rods	
Cones, traffic control	22	Corbels, cabinet	372	drapery hardware	127
Confessionals	461	Cord sets	31	shower	24
Conflict resolution	20	Core	563	Curtain wall	419
Connection, Internet	130	brick testing	316	Curtains	
Connections		cutting, concrete	317	industrial and commercial	471
sewer	266	grouting	370	lift equipment	463
water heater	527	sampling (soil testing)	213, 378	residential	127
Connectors		Cork	279	stage	462
computer cable	594	insulation	399	Cut and fill excavation	603
construction	161	running track	465	Cutting	
framing	159, 161	sheathing	435	asphalt	371
Sealtite	553	Corner			
straps	566	bead	188, 223, 426	boards	454
wood	159	cabinets	31	brick	370
Conservatories	481	guards, metal	387, 404	concrete	370
Construction		mold	223	masonry	370
barricades	22	molding	222	slabs	370
camps, manufactured	480	record (surveying)	313	steel	388
economics	307	Cornice molding	54	walls	370
elevators and hoists	319	Cornices, painting	240	Cypress flooring	156
keying	170	Corrugated			
loans	311	fiberglass	150	<b>D</b>	
photographs	318	glass	422	Dampers, air regulating,	
signs	318	mats	220	fireplace	151
tools, rental	320	metal pipe	634	Damproofing	397
Consultants' fees	134, 313	metal roofing	260, 400	Danger signs	318
Contact cement	18	metal siding	276, 400	Danish oil stain	237
Containers, storage, rental	331	pipe	634	Deadbolt locks	
Containment, asbestos	338	polycarbonate	150	commercial	420, 421
Contingency	208, 310	Polyethylene pipe	634	residential	170
Continuous spread footings	377	Polyethylene tubing	631	Debris removal	310, 331, 337
Contractor insurance	185	Cost adjusting, labor	4	Deck	
Contractor's labor burden		Cost adjustments, city	12-15	painting	438
industrial & commercial	309	Cost engineering	313	Decking	
residential	10	Costs listed in this book	4	redwood	98
Control		Cotton insulation	183	Decks	98
erosion	624	Cotton mat reinforcing	257	cementitious	369
fund fee	311	Counter-flashing	268, 403	composite lumber	98
joints	373	Counters, bank	452	concrete	369
pests (soil treatment)	280	Countertop		covers	99
valves	523, 618	crystalite	96	diagonal pattern	98
Control panels		Countertop steamers	454	fiber plank	369
alarm	591	Cleaners		finish room	99
motor	566	cleaning	83	flashing	268, 270
Control switch, fan	141	Corian	97	flashing, Vycor	27
Controls		engineered stone	96	footings	100
hydronic	172	granite	96	handrail	99
irrigation	618	labor costs	96	metal	384
motor	566	laminated plastic	96	metal, demolition	336
sprinkling	620	plastic	473	nails	228
Convertible range hood	254	tile	290, 433	painting	437
Conveying equipment	488	Couplings			
Conveyors		ABS	513	pine	98
belt	491	black steel	494	posts	99
checkroom	453	copper	504	pressure treated	98
concrete, rental	322	CPVC	507	railing	99
oven	456	drain pipe	126	redwood	98
Cooking equipment	453	threaded	543	roof	50, 99, 384, 385
Cooktops		Court, athletic, surface primer	466	stain	236
residential	255	Cove base	154	stairs	99
Coolers	457	Cove molding	222, 224	waterproofing	294
drinking water	534	MDF	226	yard and patio	100
HVAC	180			Decontamination	
walk-in	457			lead-based paint	233, 435
Cooling				PCBs	435
air conditioning	180			radioactivity	435
heat pump	178, 179			toxic chemicals	435

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Decora glass block .....	217	capuccino .....	458	mirrors .....	221
Decorative glass, ecclesiastical.....	470	cash .....	453	openers .....	164
Dehumidifiers, rental .....	329	gasoline .....	449	openings, framing.....	43
Deli case, food service .....	454	paper towel .....	445	openings, steel framing .....	66
Delivery expense defined.....	3	ticket.....	450	paint removal .....	233
Delivery, office trailers .....	330	toilet paper .....	445	painting, exterior .....	240
Deluge valves .....	492	Disperser, rain gutters.....	406	painting, interior .....	241
Demobilization.....	314	Display case, food .....	454	peep sights .....	171
Demolition .....	100, 334	Display panel for map, schedule.....	480	protectors .....	444
asbestos .....	338	Disposal .....		pulls .....	170
asphalt .....	102	asbestos .....	338	push plates .....	170
building .....	104, 334	fields .....	265	rehang .....	52
ceiling .....	100	waste .....	332	removal .....	101, 337
concrete .....	100	Disposers, garbage commercial .....	458	repair .....	52
concrete block .....	100	residential.....	128, 248	sealant .....	78
curb .....	101, 477	Dispute resolution .....	20	seals, loading dock .....	452
doors .....	101	Distillation, water .....	250	seals, weatherstrip .....	294
fence .....	333	Distribution, electric.....	577	security switch .....	589
flooring .....	101	overhead .....	577	shim .....	52
guardrail .....	333	panels .....	570, 572	shoe .....	286
joists .....	103	switchboards.....	570	sidelites .....	110
manholes .....	333	Ditch Witch .....	598	sill, oak .....	286
masonry .....	100	Ditching .....	136, 597	stop .....	171, 420
plumbing fixtures .....	478	Ditra membrane .....	94	stop molding .....	53
roof .....	336	Divider strips, terrazzo .....	433	thresholds .....	222, 285, 421
roofing .....	102	Dividers .....		trim .....	222
sheathing and siding .....	102	partition .....	443	twin door portal .....	485
stairs.....	103	redwood .....	615	weatherstripping .....	294, 421
subcontract .....	104	Docks, loading .....	354	Door stops molding .....	108
toilet partitions .....	478	bumpers .....	365, 451	Door trim .....	108
walls .....	103, 335	equipment .....	451	Doorbell, wiring .....	105
windows .....	103	levelers .....	365, 451	Doors .....	
wood framing .....	103, 104	lifts .....	451	access .....	253, 266, 418, 525
Demountable partitions .....	443	seals .....	451	accordion .....	417, 443
Dens Glass sheathing .....	182	shelters .....	452	air curtain .....	417
Deposit boxes .....	453	Documentation, photographs .....	318	aluminum, patio .....	120, 121
Depository doors, after hours ...	453	Dolly, rental .....	329	automatic .....	479
Desalination, water .....	250	Domes .....		bar .....	118
Desks		lighted ceilings .....	79	basement .....	23
bank .....	452	playground .....	467	bi-fold .....	124, 125
study .....	459	skylights .....	277	bypass .....	123, 124
Detailed block .....	213	Door .....		café .....	118
Detection systems .....	591	accessories, bypass .....	124	camber top .....	112
Detectors		aluminum .....	419	carved .....	107
audio .....	264	bank vault .....	452	cellar .....	23
fire .....	264	belts, wiring .....	128	cleanout, fireplace .....	151
infrared .....	264	bottom .....	286	closet .....	119, 123, 124
security .....	591	canopy .....	21	closet, installation .....	52
smoke .....	264	casing .....	53, 108	composite .....	119
vehicle .....	450	chimes .....	105	convenience store .....	485
Detour signs, barricade .....	22	cleaning .....	83	depository .....	453
Dewatering .....	602	closers .....	105	Dutch .....	444
Diamond lath .....	188	closers, hinge pin .....	105	entry .....	107, 111, 112
Diaphragm meter .....	638	coverings .....	273	entry, steel .....	112
Diffusers, light .....	583	demolition .....	101	exterior .....	106, 110
Digging		finish carpentry .....	52	exterior, steel .....	109, 110, 111
concrete work .....	338	frame protectors .....	444	fiberglass .....	112, 113, 415
excavation .....	136	frames, metal .....	387, 414	fire .....	415
post holes .....	144	frames, painting .....	240	fire-rated .....	109
Digital		frames, pocket .....	171	flexible strip .....	418
networking systems .....	131	framing .....	43	flush closet .....	124
photography .....	318	framing, steel .....	66	flush exterior .....	106
Digital recorder .....	592	handle sets .....	170	flush interior .....	116
Dimension lumber .....	194, 201	hangers .....	171	folding .....	122
Dimmer switches .....	129, 564	hangers, pocket .....	171	folding, installation .....	52
Dimmer switches, fluorescent... <td>564</td> <td>hardware .....</td> <td>53, 125, 421</td> <td>foundation access .....</td> <td>291</td>	564	hardware .....	53, 125, 421	foundation access .....	291
Direct overhead .....	310	hardware kit .....	171	frames, wood .....	415
Directory boards .....	441	hardware, exit .....	171	French, interior .....	117
Dirt, recycling .....	332	hardware, garage .....	165	garage .....	164
Disability Insurance .....	285	hardware, threshold .....	285, 286	handicapped .....	479
Disabled, access for .....	476	hinges .....	420	handicapped, automatic .....	479
Disappearing stairs .....	284	jamsbs, exterior .....	108	hangar .....	416
Disconnect switches .....	577	jamsbs, interior .....	118	hanging .....	52
Dishwashers		kick plates .....	170	hardboard .....	106, 118
commercial .....	458	knockers .....	170	hollow metal .....	412
electrical .....	248	lever latchset .....	170	interior, café .....	118
plumbing .....	248	lever, privacy .....	170	interior, fire-rated .....	109
residential .....	248	locks .....	122	interior, French .....	117, 120
return panels .....	31	locksets .....	170	interior, hollow core .....	116
wiring .....	128	louvers .....	417	interior, louver .....	117, 120
Dispensers		mantels .....	295	interior, panel .....	116, 117, 119, 120
beverage .....	458	interior, prehung .....	118, 119	interior, prehung .....	118, 119

Drafting	
architectural	126
plans	20
survey	313
Draftshield	294
Dragline	
excavation	599
rental	322
Dragon teeth	450
Drain	
fields	265
fittings	512
lines, demolition	333
rock	604
Drain pipe	
ABS	512
copper	512
fittings	126
fittings, corrugated	631
Hi-Q	631
plastic	126, 512
Drain protection	604
Drainage	
fabric	603
pipe	126, 631
slope protection	604
Drainage systems	
rock and sand fill	126
Drainboards, countertops	290
laminated plastic	473
stainless steel	457
tile	433
Drains	
area	525
fiberglass	634
floor	516, 525
foundation footing	126
gratings	387
piping	126
precast	127, 634
rain	127
roof	525
rough-in	532
systems	127
trench	634
Draperies	127, 471
Drawers	29
kitchen work table	454
stainless steel	454
Drawings	
architectural	20
as-built	126
reproduction of	25
Drench showers	531, 534
Dressing cubicles	442
Drill rental	320, 326
Drilled caissons	608
Drilling	
concrete	370
post holes	617
rock	595
soil testing	279
steel	388
well	295
Drinking fountain	534
handicapped	477
rough-in	531
Drip cap	267, 268
door	287
molding, wood	224, 276
Drip edge	267, 268
Drive shoe	295
Driveway gates	143, 165, 618
Driveways	
apron	615
asphalt	243
coating	237
concrete	84, 94, 244, 615
demolition	101, 332
forms	88, 94
paint removal	234
Drop	
ceiling	79, 80
poles, electrical	318
Drop cloths	285
painting	439
Dry pack grout	361
Dry pipe sprinklers	492
Dryers, clothes	
circuits	543
receptacles	563
vent sets	291
wiring	128
Dryers, hand	
446	
wiring	447
Dryvit finish, exterior	400
Drywall	
adhesive	17
demolition	102, 335
expansion joints	412
finish	168
gypsum	168, 293, 423
insulation board	398
nails	229
painting	238, 241
primer	234
screws	229
specialties	424
texture	169
vinyl clad	424
wallboard	293
wallboard assemblies	34
Drywall installer, wage	
industrial & commercial	309
residential	10
Drywall taper, wage	
residential	10
Duct	
cable tray	557
electrical	556
fiberglass	177
flex	177
painting	437
sheet metal	177
underfloor	557
underground	541
Ductile iron pipe	628
Ducting	253
Ductwork, painting	437
Dumbwaiters	133, 488
Dummy knobs	421
Dump fees	332
Dump trucks	
debris hauling	337, 600
general hauling	137
rental	139, 324
Dumpsters, trash	332
Duplex nails	231
Duplex receptacles	129, 563
Dupont wood flooring	157
Durock backer board	290
Dur-O-Wal	219
Dursban T-C	280
Dust control	337
DWV pipe	
ABS	512, 513
copper	512
E	
Earthwork	594
compacting	603
Easings	
stair	56, 284
stair rail	284
Eave closure	262
Eave louver vents	291
Eaves, painting	240
Ecclesiastical	
equipment	460
glass	470
Eco-Block	86
Economics division	307
Edge forms, concrete	88, 340
Edge pulls	171
Edgers, rental	327
Edging	
redwood	187, 615, 625
roof	267
sill	286
strip	154
Educational	
networks	459
Educational equipment	458
Efflorescence, testing	316
Egg knob locksets	170
Eggcrate louvers	80
Egress	
barrier	487
portal	487
window	305
EIFS exterior wall system	400
Ejectors, sewage	528
Elastomeric	
flashing	373
latex sealant	78
membrane	294
painting	437, 438
pipe insulation	523
roof coating	257
waterproofing	294
Elbows	
ABS	513
black steel	494
copper	504
CPVC	507
CPVC and brass	508
PVC	506
Electric service	
industrial & commercial	570
residential	127
temporary	310, 318
Electrical	
alarms	541
alarm systems	128, 264
boxes	542
boxes, outlet	561
building wire	558
cable tray	557
circuit breakers	567
conduit	543
cover plate	565
cutouts	577
device boxes	556
distribution	577
duct, concrete	541
duct, surface	556
fence, charging unit	144
fuses	575
generators	131, 578
generators, rental	326
ground wire	558
grounding	566
handy box	562
heater	175
heating	536
junction boxes	563
lighting	128
loadcenters	573
metallic tubing	543, 544
motors	566
multi-outlet raceway	557
outlet boxes	556
outlets	129, 563
overhead	577
panels	572
poles	577
power, temporary	319
raceway	556
raceway fittings	556
receptacle boxes	556
receptacles	129, 563
service	589
service entrance cable	127
EPA	
standards	581
Tier IV pollution control rating	579
EPDM	402
EPDM roof coating	402
Epoxy	
bed	382
painting	437, 438
sprinkler controls	189
subcontract	127
switches	564
switchgear	571
systems, solar	582
temporary power	319
transformers	572
tubing	543
underfloor duct	557
unit heater	535
valves	189
water heaters	130
wireway	556
Electrician, wage	
industrial & commercial	309
residential	10
Electricity, solar	280
Electrostatic precipitators	455
Elevated water tanks	630
Elevator signs, braille	479
Elevator constructor, wage	
industrial & commercial	309
Elevators	
commercial	490
construction-type	319
geared	489
hydraulic	133, 490
passenger	489
residential	133
sidewalk	489
subcontract	133
Embankment grading	597
Embeco grout	355
Embedded steel	387
Embossed concrete	96
Emergency LED power	585
Emergency lighting	587
Emergency shower	534
rough-in	531
Emissions reduction	579, 581
Employer labor taxes	
industrial & commercial	309
residential	10
EMT	
544	
conduit	544
conduit circuits	547
fittings	545
Enamel gloss, floor and porch	235
Encapsulated insulation	181
Enclosures	
246, 272, 442	
bus stop	479
cubicles	442, 443
panel	563
sauna	263
temporary	331
swimming pool	481
tennis court	481
End cap	260
Endwall flashing	268
Engineer, overhead	310
Engineering fees	
134, 313	
tilt-up construction	362
Enkebolt molding, cabinets	31
Entrance	
cap, threaded	544
hoods	270
mats	220, 474
thresholds	285
Entrances	
colonial	134
wood	134
Entry doors	
107, 111, 112	
fiberglass	112, 113
Envalex ceiling domes	79
Environmental noise survey	134
EPA	
standards	581
Tier IV pollution control rating	579
EPDM	402
EPDM roof coating	402
Epoxy	
bed	382
painting	437, 438

Epoxy-coated rebar.....	346	Exhaust	Fans, exhaust	vinyl.....	149																																																																																																																																																																																																																																																																																			
Epoxy-coated wire mesh.....	349	fume system .....	attic .....	wire mesh.....	143																																																																																																																																																																																																																																																																																			
Epoxy-tie adhesive.....	17	hoods, food service .....	bath .....	wood .....	148																																																																																																																																																																																																																																																																																			
EPS forms .....	87	range hoods.....	bath switch.....	wood gate.....	147																																																																																																																																																																																																																																																																																			
Equipment .....	449	vents, dryer .....	bath timer .....	Fertilizer .....	187, 623																																																																																																																																																																																																																																																																																			
checkroom.....	453	Exhaust fan	bath vent kit .....	Fescue seeding.....	624																																																																																																																																																																																																																																																																																			
educational.....	458	bath .....	bath with heat .....	Fiber .....																																																																																																																																																																																																																																																																																				
food service .....	453	bath, with heater .....	bath with light.....	cant strips .....	403																																																																																																																																																																																																																																																																																			
foundations .....	366	food service .....	commercial .....	forms .....	344																																																																																																																																																																																																																																																																																			
loading docks .....	451	QuiTTest .....	roof vents .....	roof coating.....	257																																																																																																																																																																																																																																																																																			
mobilization.....	314	roof vent .....	utility .....	Fiber cement .....																																																																																																																																																																																																																																																																																				
overhead .....	310	switch .....	139, 140	lap siding .....	274																																																																																																																																																																																																																																																																																			
pads .....	352	timer switch .....	141	roofing .....	261																																																																																																																																																																																																																																																																																			
paint sprayer .....	239	utility .....	139	Fiber floor, Tarkett .....	153																																																																																																																																																																																																																																																																																			
painting .....	436	ValueTest .....	140	Fiber mesh concrete .....																																																																																																																																																																																																																																																																																				
parking control .....	450	wiring.....	128	reinforcing .....	85																																																																																																																																																																																																																																																																																			
service station .....	449	with infrared heater .....	140	Fiber optic cable .....	592																																																																																																																																																																																																																																																																																			
Equipment rental .....	320	Exhaust stack.....	581	Fiberboard wallboard .....	293																																																																																																																																																																																																																																																																																			
Erickson couplings .....	543	Existing conditions .....	332	Fiberglass .....																																																																																																																																																																																																																																																																																				
Erosion control .....		Exit door hardware .....	421	base sheet .....	257, 258																																																																																																																																																																																																																																																																																			
fabric .....	604	touch bar .....	171	bathtubs .....	245, 533																																																																																																																																																																																																																																																																																			
fence .....	604	Exit signs .....	586	ceilings .....	82																																																																																																																																																																																																																																																																																			
landscaping .....	624	Expanded polystyrene board .....	399	doors, entry .....	112, 113																																																																																																																																																																																																																																																																																			
silt fence .....	150	Expansion	Fasteners, painting .....	drains .....	634																																																																																																																																																																																																																																																																																			
soil covers, stabilization .....	603	shields .....	437	duct .....	634																																																																																																																																																																																																																																																																																			
Escalators .....	490	strips .....	217	insulation .....	177																																																																																																																																																																																																																																																																																			
Escape window .....	305	Expansion joints .....	426	panels .....	181, 398, 399																																																																																																																																																																																																																																																																																			
Estimating, accuracy .....	5	composition .....	219	pipe insulation .....	150																																																																																																																																																																																																																																																																																			
Etch, acid .....	466	concrete .....	85, 355	septic tanks .....	524																																																																																																																																																																																																																																																																																			
Etching concrete .....	357	covers .....	412	shower receptors .....	265																																																																																																																																																																																																																																																																																			
Eternit .....	261	glass block .....	381	showers .....	272																																																																																																																																																																																																																																																																																			
Ethylene Propylene Diene Monomer .....	402	lath .....	188	tub and shower combination .....	246																																																																																																																																																																																																																																																																																			
Euro pavers .....	215	masonry .....	219	whirlpool bath .....	533																																																																																																																																																																																																																																																																																			
European ISO standards .....	579, 581	preformed .....	412	Evaporative coolers .....	177	sealants .....	412	Fiberglass-reinforced plastic .....		Evaporator coil .....	179	Expansion tank .....	249	adhesive .....	18	Excavation .....		boiler .....	173	paneling .....	243	air hammer .....	138	Explosives, loading .....	595	Fibermesh screen .....	264	backfilling .....	136	Exposed aggregate finish .....	95, 356	FICA .....	285	backhoes .....	138	Extension cords, rental .....	327	Field offices, temporary, rental .....	330	blasting .....	595	Exterior doors .....	106	Fields, playing .....	465	brushing .....	138, 594	flush .....	106	Fill .....		bulldozer .....	138	hollow metal .....	412	caulking .....	79	caissons .....	608	jams .....	108	excavation .....	135, 339, 597	clearing .....	138	prehung .....	110	rock .....	339, 604	compaction .....	136, 597	steel .....	414	sand .....	18, 339	dozer .....	601	Exterior house paint .....	234, 235	slab base .....	339	dragline .....	599	Exterior Improvements .....	609	Fill investigation .....		drilling .....	595, 608, 609	Exterior wall assemblies .....	35, 58	compacted .....	317	embankment .....	597	Exterior wall system (EIFS) .....	400	soil testing .....	279	equipment rental .....	138, 322	Extinguishers, fire .....	434, 493	Filler .....		erosion control .....	603, 604	cabinets .....	493	block .....	237	fine grading .....	135	Extruded polymer molding .....	226	panels, cabinet .....	31	footings .....	135	Eye wash shower .....	531	wood filler .....	238	foundation .....	338			Filler strip .....		grading .....	135, 339, 596	Fabric	cabinet .....	55	hand .....	602	draperies .....	127	chain link fence .....	142	hand work .....	135, 339	erosion control .....	604	Film, polyethylene .....	253	hauling .....	600	lead mesh .....	471	Filter sock .....	126, 631	loaders .....	136, 597	stage curtain .....	462	Filter, air, central .....	176	loading trucks .....	138, 600	wallcover .....	435	Filters .....		manual .....	602	Fabricated metals .....	387	exhaust hood .....	455	pneumatic .....	138	Facade screen .....	406	screen .....	295	post holes .....	144	Face board .....	145	water .....	529	ripping .....	596	Face brick .....	210, 374	Financing, project .....	311	riprap .....	604	Faceted glass .....	470	Fine grading .....		rock .....	135	Facing tile .....	374	embankment .....	597	scraper-hauler .....	601	Facing, marble fireplace .....	208	hand .....	135	shovels .....	135	Factory rep, cost .....	314	landscaping .....	623	slope protection .....	604	Fan lite doors .....	113	pavement .....	243, 609	spreading .....	597	Fan units, heaters .....	535	slabs .....	339, 596	spreading material by hand .....	136	Fans	Finish carpentry .....	51	sprinkling .....	138	garage .....	142	backing .....	51	tamping .....	339, 597, 599	rental .....	329	blocking .....	51	tamping, by hand .....	136	turbine .....	407	cabinet installation .....	55	topsoil, by hand .....	136	wiring .....	128	cased openings .....	52	tractors .....	138	Fans, ceiling .....	142	closet poles .....	55	tree removal .....	594	light kit .....	142	closet shelves .....	55	trenching .....	136, 597		countertops .....	96	trucks .....	138		door accessories .....	105, 420	wheel loaders .....	598		door casing .....	52
Evaporative coolers .....	177	sealants .....	412	Fiberglass-reinforced plastic .....																																																																																																																																																																																																																																																																																				
Evaporator coil .....	179	Expansion tank .....	249	adhesive .....	18																																																																																																																																																																																																																																																																																			
Excavation .....		boiler .....	173	paneling .....	243																																																																																																																																																																																																																																																																																			
air hammer .....	138	Explosives, loading .....	595	Fibermesh screen .....	264																																																																																																																																																																																																																																																																																			
backfilling .....	136	Exposed aggregate finish .....	95, 356	FICA .....	285																																																																																																																																																																																																																																																																																			
backhoes .....	138	Extension cords, rental .....	327	Field offices, temporary, rental .....	330																																																																																																																																																																																																																																																																																			
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brushing .....	138, 594	flush .....	106	Fill .....																																																																																																																																																																																																																																																																																				
bulldozer .....	138	hollow metal .....	412	caulking .....	79																																																																																																																																																																																																																																																																																			
caissons .....	608	jams .....	108	excavation .....	135, 339, 597																																																																																																																																																																																																																																																																																			
clearing .....	138	prehung .....	110	rock .....	339, 604																																																																																																																																																																																																																																																																																			
compaction .....	136, 597	steel .....	414	sand .....	18, 339																																																																																																																																																																																																																																																																																			
dozer .....	601	Exterior house paint .....	234, 235	slab base .....	339																																																																																																																																																																																																																																																																																			
dragline .....	599	Exterior Improvements .....	609	Fill investigation .....																																																																																																																																																																																																																																																																																				
drilling .....	595, 608, 609	Exterior wall assemblies .....	35, 58	compacted .....	317																																																																																																																																																																																																																																																																																			
embankment .....	597	Exterior wall system (EIFS) .....	400	soil testing .....	279																																																																																																																																																																																																																																																																																			
equipment rental .....	138, 322	Extinguishers, fire .....	434, 493	Filler .....																																																																																																																																																																																																																																																																																				
erosion control .....	603, 604	cabinets .....	493	block .....	237																																																																																																																																																																																																																																																																																			
fine grading .....	135	Extruded polymer molding .....	226	panels, cabinet .....	31																																																																																																																																																																																																																																																																																			
footings .....	135	Eye wash shower .....	531	wood filler .....	238																																																																																																																																																																																																																																																																																			
foundation .....	338			Filler strip .....																																																																																																																																																																																																																																																																																				
grading .....	135, 339, 596	Fabric	cabinet .....	55																																																																																																																																																																																																																																																																																				
hand .....	602	draperies .....	127	chain link fence .....	142																																																																																																																																																																																																																																																																																			
hand work .....	135, 339	erosion control .....	604	Film, polyethylene .....	253																																																																																																																																																																																																																																																																																			
hauling .....	600	lead mesh .....	471	Filter sock .....	126, 631																																																																																																																																																																																																																																																																																			
loaders .....	136, 597	stage curtain .....	462	Filter, air, central .....	176																																																																																																																																																																																																																																																																																			
loading trucks .....	138, 600	wallcover .....	435	Filters .....																																																																																																																																																																																																																																																																																				
manual .....	602	Fabricated metals .....	387	exhaust hood .....	455																																																																																																																																																																																																																																																																																			
pneumatic .....	138	Facade screen .....	406	screen .....	295																																																																																																																																																																																																																																																																																			
post holes .....	144	Face board .....	145	water .....	529																																																																																																																																																																																																																																																																																			
ripping .....	596	Face brick .....	210, 374	Financing, project .....	311																																																																																																																																																																																																																																																																																			
riprap .....	604	Faceted glass .....	470	Fine grading .....																																																																																																																																																																																																																																																																																				
rock .....	135	Facing tile .....	374	embankment .....	597																																																																																																																																																																																																																																																																																			
scraper-hauler .....	601	Facing, marble fireplace .....	208	hand .....	135																																																																																																																																																																																																																																																																																			
shovels .....	135	Factory rep, cost .....	314	landscaping .....	623																																																																																																																																																																																																																																																																																			
slope protection .....	604	Fan lite doors .....	113	pavement .....	243, 609																																																																																																																																																																																																																																																																																			
spreading .....	597	Fan units, heaters .....	535	slabs .....	339, 596																																																																																																																																																																																																																																																																																			
spreading material by hand .....	136	Fans	Finish carpentry .....	51																																																																																																																																																																																																																																																																																				
sprinkling .....	138	garage .....	142	backing .....	51																																																																																																																																																																																																																																																																																			
tamping .....	339, 597, 599	rental .....	329	blocking .....	51																																																																																																																																																																																																																																																																																			
tamping, by hand .....	136	turbine .....	407	cabinet installation .....	55																																																																																																																																																																																																																																																																																			
topsoil, by hand .....	136	wiring .....	128	cased openings .....	52																																																																																																																																																																																																																																																																																			
tractors .....	138	Fans, ceiling .....	142	closet poles .....	55																																																																																																																																																																																																																																																																																			
tree removal .....	594	light kit .....	142	closet shelves .....	55																																																																																																																																																																																																																																																																																			
trenching .....	136, 597		countertops .....	96																																																																																																																																																																																																																																																																																				
trucks .....	138		door accessories .....	105, 420																																																																																																																																																																																																																																																																																				
wheel loaders .....	598		door casing .....	52																																																																																																																																																																																																																																																																																				

door trim.....	52	wood-burning.....	152	drains.....	516, 525	Fluorescent dimmer switches...	564
doors.....	52	Fireproof caulking.....	78	drains, ABS.....	516	Fluorescent lighting.....	190, 582
entrances.....	134	Fireproofing		drains, plumbing.....	525, 532, 535	Flush bushing, ABS.....	516
fireplace mantels.....	55	columns.....	409	enamel.....	235	Flush doors.....	124, 415
fireplace surrounds.....	55	concrete.....	407	equipment rental.....	326	bi-fold closet.....	124
flooring.....	197	spray-on.....	409	flange.....	515	birch interior.....	115, 116
flooring, wood.....	55	testing.....	316	framing.....	34	fire-rated.....	109
folding stairs.....	284	wood.....	207	furring.....	50	hardboard.....	106
furring.....	52	Fire-rated doors.....	109, 415, 416	grating.....	387	hardboard interior.....	115, 116, 118
hardware.....	420	First aid, overhead.....	310	joists.....	34, 40, 41, 390	hardwood exterior.....	110
job-built stairways.....	283	Fishtape, rental.....	329	joists, piecework.....	38	lauan exterior.....	106
locksets.....	53	Fittings		joists, steel.....	59, 73	lauan interior.....	116, 118
lumber.....	226	ABS bungalow.....	514	joists, steel blocking.....	62	oak interior.....	116
mantels.....	208	black steel.....	494	leveling compound.....	154	steel exterior.....	110
medicine cabinets.....	220	copper.....	503	mats.....	220, 473	steel utility.....	110
molding.....	54, 226	CPVC.....	507	painting.....	238, 437, 438	Flush interior doors	
paneling.....	54	CPVC and brass.....	508	piecework rates.....	38	lauan.....	116
railings, stair.....	56	drain pipe.....	126	plank, precast.....	358	Foam insulation.....	182
running molding.....	55	electrical.....	563	plate, steel.....	385	Foam panel adhesive.....	18
sauna rooms.....	263	PEX.....	509	polishing.....	238	Foamglass insulation.....	399
shutters.....	272	PEX-AL.....	511	radiant heat.....	174	Foil-backed gypsum.....	424
siding.....	276	Polyethylene pipe.....	629	safes.....	262, 452	Foil-faced insulation.....	397
skylights.....	277	PVC.....	506	sheathing.....	34, 392	Folding beds.....	25
soffits.....	279	PVC water pipe.....	628	shellacking.....	238	Folding doors.....	122, 417, 443
stair balusters.....	56	Fixtures		sinks, plumbing.....	535	locks.....	122
stairs.....	56, 281	electrical.....	129, 190	slab.....	352	Folding fire partitions.....	444
thresholds.....	285	lamps.....	588	slab, concrete.....	94	Folding stairs.....	284
wall paneling.....	54	lighting.....	190, 588	slab, precast.....	358	Food	
wallboard.....	293	plumbing.....	535	staining.....	238	beverage dispenser.....	458
weatherstripping.....	294	rough-in.....	251, 252	steel, piecework.....	73	deep fat fryers.....	455
window sills.....	296	Flagpoles.....	448	varnishing.....	238	freezers.....	457
window trim.....	53	aluminum.....	448	waxing.....	238	meat and deli cases.....	454
Finish grading.....	135, 187, 243	foundations.....	449	Floor layer, wage.....		mixers.....	457
Finish hardware.....	421	Flagstone		industrial & commercial.....	309	pizza preparation units.....	454
Finish, drywall.....	168	floors.....	216, 220	residential.....	10	pot and pan racks.....	456
Finishes.....	423	pavers.....	613	Flooring		sandwich preparation units.....	454
decks.....	98	Flameproofed draperies.....	471	access.....	434	service equipment.....	453
flooring.....	431	Flanged pipe, cast iron.....	626	anti-fatigue.....	432	stations.....	453
gypsum wallboard.....	423	Flanges		artificial turf.....	465	toasters.....	456
plaster.....	244	ABS closet.....	515	bamboo.....	157	warmers.....	454
wallpaper.....	293, 435	black steel.....	494	brick.....	220	work tables.....	454
Finishing		Flash cone.....	268, 269	carpet.....	76, 433	Foot grille.....	474
concrete.....	94, 95, 356	Flashing		carpet tile.....	434	Football goal posts.....	465
flooring.....	156	aluminum.....	267	ceramic tile.....	289	Footings	
nails.....	230	aluminum siding.....	276	crossband parquet.....	158	bell.....	609
Fink truss.....	49, 73, 395	building paper.....	27	demolition.....	101, 336	bollard.....	616
Finned tube radiation.....	537	compound.....	257	Douglas fir.....	156, 194, 196	caissons.....	608
Fir		copper.....	267	finishing.....	56	column.....	94
flooring.....	156, 194, 196, 197	demolition.....	336	fir.....	156, 194, 196, 197	continuous.....	93
Fire		galvanized.....	268, 404	flagstone.....	216, 220	demolition.....	100, 335
alarm breaker.....	570	lead.....	269, 404	floating hardwood.....	157	drains.....	126
alarm systems.....	434, 591	masonry.....	373	gymnasium.....	430, 464	estimating.....	93
alarms.....	128	paper.....	27	installation.....	431	excavation.....	135
boxes.....	151	ridge.....	260	marble.....	208, 381	forms.....	339
brick.....	212	roof jack.....	526	masonry.....	220, 382	keyway.....	93
dampers.....	151	roofing.....	260, 403	non-slip tile.....	432	spread.....	377
detectors.....	591	sealant.....	78	parquet.....	430	ties.....	86
doors.....	109, 415	sheet metal.....	267	pedestal.....	434	tilt-up.....	361
escapes.....	387	skylight.....	279	Pergo.....	157	Forced air furnaces.....	177
extinguishers.....	434, 493	stainless steel.....	404	pine.....	155, 156	Forged steel valves.....	519
hose cabinets.....	493	vinyl.....	270	plank.....	155	Forklift, rental.....	324
hydrants.....	627	Flexible conduit.....	553	quarry tile.....	381, 429	Form stakes.....	205
hydrants, demolition.....	334	Flexible strip doors.....	418	raised, installation.....	434	Formboard, fiber deck.....	369
pole tower, playground.....	469	Flexure test.....	315	resilient.....	431	Formica countertops.....	96
protection.....	455	Flexwood.....	434	rubber.....	432	Forming	
protection equipment.....	491, 492	Flight, photography.....	313	safety tiles.....	432	architectural.....	341
pumper connection.....	493	Float finish		sheet vinyl.....	153, 431	landing.....	346
sprinkler systems.....	150, 491	concrete.....	95, 356	softwood.....	156, 430	softs.....	346
suppression.....	491	tile.....	431, 434	Tarkett.....	153	Forms	
wall hydrants.....	493	tile,.....	431, 434	terrazzo.....	382, 433	beam.....	345
Fire retardant treatment.....	207	tile,.....	431, 434	tile.....	431, 434	board.....	88
Fireblocks.....	45	tile, vinyl.....	154	tile,.....	431, 434	breaker.....	355
Firebrick.....	212	tongue and groove.....	157	vinyl plank.....	432	clamps.....	355
Fireclay.....	212	vinyl plank.....	432	vinyl sheet.....	431	column.....	340
Fireplaces.....	151	wood.....	156, 430	vinyl tile.....	153, 431	concrete.....	86, 87, 93, 339
brick.....	212	wood laminate.....	157	wood.....	156, 430	concrete insulated.....	86, 87
electric.....	152	wood strip.....	55, 155, 157	wood strip.....	55, 155, 157	curb.....	88
finish carpentry.....	55	FlowGuard Gold pipe.....	507	FlowGuard Gold pipe.....	507	footing.....	88
gas-burning.....	152	Flue		fireplace.....	152	foundation.....	88
mantels.....	208	fireplace.....		lining.....	216, 374	keyway.....	88
masonry.....	220, 374	Flue		liner, architectural.....		liners.....	365
prefabricated.....	374	fireplace.....		liners.....		oil, concrete.....	341
surrounds.....	55	fireplace.....		oil, concrete.....		oil, concrete.....	355

plastic.....	86, 87
plywood.....	88, 339, 342, 369
release .....	355
shoring.....	605
slab .....	340
snap ties .....	86
spreader.....	355
stakes.....	86
stripping.....	89
ties.....	86, 355
tilt-up .....	362
wall.....	88, 341
Formwork	
column .....	342, 344
concrete .....	339
steel-framed plywood .....	342
steps .....	346
stripping .....	89
Fortifiber products.....	27
Foundation	
forms .....	88, 339
forms, reinforcing.....	88, 346
formwork .....	339
insulation.....	182
investigation, soil testing .....	280
layout.....	189
placing .....	351
poisoning .....	280
soil calculations .....	279
stakes.....	205
trenching .....	597
vents.....	291
waterproofing.....	294
Foundations	
access door .....	291
anchor bolts .....	363
anchors .....	59
bell.....	609
bolts .....	159
caissons .....	608
coating, asphalt .....	237
concrete .....	84, 92, 339, 351, 353
demolition .....	100, 335
drains .....	126
equipment .....	366
excavation .....	338
flagpoles .....	449
footings .....	93
injected .....	608
masonry walls .....	377
pile.....	606
pole .....	587
tilt-up construction .....	361
Fountains	
decorative .....	486
drinking .....	534
drinking, handicapped .....	477
ornamental .....	486
rough-in.....	531
wash.....	534
Frame seal sets.....	294
Frames	
door, painting.....	240, 241
manhole .....	636
see-thru .....	418
window, painting.....	239
Framing	
adhesive .....	17
anchors .....	161
backing and nailers .....	47
beams .....	45
blocking .....	41
bracing .....	44
canopy .....	387
carpentry .....	32
ceiling joists .....	46
clips .....	159
connectors .....	159, 161
demolition .....	103
door openings .....	43
dormer studs .....	48
fascia .....	49
fireblocks .....	45
floor trusses .....	41
furring .....	50
grounds .....	51
ledgers and ribbons .....	47
lumber .....	194, 201
nails .....	229
piecework .....	37
piecework rates .....	39, 74
posts .....	45
roof .....	47
roof sheathing .....	49, 50
roof trusses .....	48
steel .....	57, 68, 383
steel collar beams .....	72
steel exterior wall studs .....	64, 65
steel interior wall studs .....	63, 64
steel stud .....	63
subflooring .....	42
trimmers and curbs .....	48
wall plates .....	42
wall sheathing .....	51
wall stud wood .....	389
walls, exterior .....	42
window opening .....	44
Framing nails, screw shank .....	229
Free access flooring .....	434
Freezers	
food service .....	457
medical .....	469
wiring (subcontract) .....	129
Freight elevators.....	490
French doors.....	117
interior, double .....	120
Frenchwood .....	120
Frequency meter.....	571
Fresnel globes .....	586
Fresnel-type spotlight .....	463
Frieze molding .....	55
Frieze vents .....	406
Fringe benefits	
industrial & commercial .....	309
residential .....	10
FRP	
adhesive .....	18
paneling .....	243
Fryers, commercial .....	455
Fuel grates, fireplace .....	152
Fuel storage tanks .....	540
Full-view storm doors .....	114
Fume hoods .....	473
kitchen .....	455
laboratory .....	473
Fund control fees .....	311
Fungus	
prevention .....	268
treatment .....	207
Furnaces	
direct vent gas .....	177
electric work .....	128
floor .....	177
forced air .....	177
gas .....	176, 536
gravity gas .....	176
wall .....	536
Furnishings	
church glass .....	470
window treatment .....	471
Furring .....	395, 425
Floor .....	50
studs .....	52
wood .....	50
Fuses .....	575
FUTA .....	285
G	
Gabions .....	604
Gable	
roof .....	36
truss .....	49, 73, 395
Gaskets	
neoprene .....	403, 404, 412
sill plate .....	182
Gasoline dispenser .....	449
Gate valves .....	492, 519
Gates	
automatic .....	165
barrier .....	450
chain link fence .....	143
hardware .....	143, 148, 618
ornamental .....	165
parking control .....	450
security .....	115
temporary .....	331
trash enclosure .....	366
wood .....	147
wrought iron .....	388
Gateway, electronic .....	131
Gauges	
liquid level .....	540
Gel stain .....	237
General contractor	
crews .....	5
markup .....	209
General requirements .....	310
Generators .....	131, 578
exhaust stack .....	581
gas turbine,	
pollution control modules .....	581
motor-driven, pollution control modules .....	579
power .....	582
rental .....	326
steam .....	285
wind turbine .....	132
Geodesic dome, playground .....	467
Geographic cost	
adjustments .....	12-15
Geotextiles .....	603, 604
Ginnies .....	205
Girders	
carpentry .....	40, 390
concrete .....	351
forms .....	345
precast .....	359
shield flashing .....	268
steel .....	383
steel framing .....	61
Girts	
fireproofing .....	410
steel .....	383
Glass	
artwork .....	470
bead molding .....	224
cleaning .....	83, 331
float .....	422
mirrors .....	24
shelving .....	270
sliding doors .....	417
spandrel .....	419
storefront .....	419
tile .....	287
window .....	166, 422
wire .....	418
Glass block .....	217, 380
accessories .....	217
Glazed	
block .....	379
floor tile .....	428
tile .....	374
Glazier, wage	
industrial & commercial .....	309
residential .....	10
Glazing	
curtain walls .....	419
polycarbonate .....	423, 482
sash .....	422
tempered glass .....	482
Globe valves .....	520
Glove bags, asbestos .....	338
Glove painting .....	436, 437
Glue, adhesives .....	17, 18
Glu-lam beams .....	396
Goal posts, football .....	465
Goals, soccer .....	465
Golden Virola paneling .....	242
Gooseneck	
stair .....	56
stair rail .....	284
Grab bars	
bath .....	24, 445
handicapped .....	478
Gradall	
rental .....	323
trenching .....	597
Grade beams	
concrete .....	93
formwork .....	88
Graders, rental .....	323
Grading	
embankment .....	597
excavation .....	135
fine .....	136, 243
finish .....	243, 597
hand .....	135

landscaping	187, 623	pressure injected	357, 637	Hangers	radiant	174, 175	
lumber	205	testing	316	angle bracket	516	rental	326
scraper-hauler	601	tile	288, 289	channel	555	solar	249, 528
site	596	Grout, dry pack	361	clevis	517	suspended units	176
slab	339	Grouting		conduit	554	water	248, 526
tilt-up	361	concrete	96	framing	159	wiring	128
Grandstands	464, 474	concrete block cores	213, 378	header and joist	161	Heating	
Granite		pipe joints	637	painting	437	ceiling panels, radiant	175
aggregate	350	pressure	357, 637	pocket door	171	central	174
aggregate concrete	85	tilt-up	361	roof	392	coil, heat pump	179
bollards	616	GRS conduit	543	swivel ring	517	ductless	178
countertop	96	Grubbing	138, 594	timber	161	electric	175
curb	614	Guard		Hanging doors	52	floor units	174
decomposed edging	625	corner	169, 387, 444	Hardboard	204	hot water assembly	253
masonry	381	dog	265	doors	106, 116, 118	hybrid	174
paving	382, 614	gravel	268	doors, fire-rated	109	radiant ceiling panels	175
terrazzo	382	security	265	lap siding	275	radiation	537
tile	287	Guardrail		panel siding	274	solar	528
Grass		access flooring	434	paneling	242, 435	Heating and venting	538
artificial turf	465	construction	331	wallcoverings	435	Hedge trimmers, rental	327
hydroseeding	187, 624	demolition	333	Hardener, concrete	356	Help, software	3
landscaping	187, 624	highway	615	Hardi		Hem-fir	195
paving	244, 615	Gunit	357	panel	274	fascia	49
seed	624	testing	316	plank	274	Hemlock	
sod	187	Gutters		trim	274	boards	197
Grasscloth	435	apron	268	Hardware		doors	120
Grates		concrete	95, 615	bath accessories	24	lumber	195
fireplace	152	copper	405	bi-fold door	125	molding	108
tree	626	demolition	101	cabinets	472	HERS rating	184
Gratings, steel	387	ice melting cable	561	commercial and Industrial	420	Hex bolts	232
Gravel		inlets	637	door	421	High boy threshold, oak	108
aggregate	18	rain	167, 404	finish	421	High early strength	
landscaping	625	rain disperser	406	garage door	165	cement	82
paving	244, 615	sealant	78	gate	148, 618	concrete	85
pea	18	stainless steel	406	partition	443	High-bay lighting	585
riprap	604	wire, duct	556	pocket door	171	Highway	
slab base	94	Gutting, demolition	335	rule of thumb	420	equipment rental	325
Gravel guard	268	Gym		threshold	285	stakes	205
Gravel stop	268, 403	equipment	464	Hardwood		Hinges	172
demolition	336	floors	430, 464	doors, fire-rated	109	door	53, 420
Gray Board insulation	181	Gymnasium base	412	doors, prehung	110	gate	148
Grease		Gypboard demolition	335	flooring	155, 430	Hip roof	36
filters, exhaust hoods	455	Gypsum		flooring demolition	101	clay tile	261
interceptors	528	adhesive	17	paneling	242	fiber cement slate	261
Greenboard	168	ceiling panels	82	plywood	242	rafters	48
Greenhouse	167	decking, poured	369	Hat channel	219, 425	sheathing	50
panels	150	demolition	102, 335	Hat racks	453	shingles	258, 259
Greenwaste recycling	332	drywall	168, 293, 423	Hat shelf	55	steel rafters	70, 74
Grey iron	387	lath	187	Hatches, roof	407	trusses	74
Griddles, gas	456	paint preparation	239	Hauling		Hoists	
Grid-WALL	87	plaster	244, 426	debris	337	auto	450
Grilles		roofing	369	excavation	600	construction	319
foot	474	roofing, demolition	336	truck	138	freight	490
security	416, 485	H		Haunch forms	342	rental	329
Grills	469			Hazard surveys	338	service station	450
kitchen, commercial	456			Hazards testing	26	Hold down brackets	59
Grinders				HDPE drain pipe	631	Hold downs	161
pneumatic, rental	320	Hair interceptors	528	Header hangers	161	Hollow core doors	116, 117
rental	326	Hammering, concrete	356	Header pipe	602	Hollow metal doors	412
stump, rental	327	Hammers		Headers		frames	414
Grinding concrete	356	for pile drivers, rental	322	carpentry	45, 390	Hollow metal, painting	437
Grits, concrete	356	rental	322, 326	yard	615	Home energy rating	184
Ground cover	625	Hand excavation	135	Heads		Home inspection service	26
Ground fault interrupter	128	Handholes, electric	542	sprinkler	621	Home networks	130
Ground rod clamps	566	Handicapped		Headwalls	638	Home office cost	310
Ground wire	558	access	476	hearts, marble	208	Hood filters	455
Grounding		door opener	479	Heat		Hoods	
devices	128, 566	parking	477	detectors	591	entrance	270
electric	566	symbols, parking lot	616	generation	535	exhaust, food service	455
locknuts	566	Handle sets, door	170	recovery systems	580	laboratory	473
Grounds, wood	51	Handrails		Heat exchanger foundations	366	range	253, 254
Grout		access flooring	434	Heat pumps	178	range, quiet	254
brick pavers	613	iron	150	accessories	179	range, vented	253
concrete	378	painting	238, 240, 438	Heat-A-Lamp heater and fan	141	vents	260
door frames	378	patio deck	99	Heaters		Hooks	
forms, tilt-up	364	stair	56, 281, 284	baseboard	174, 175, 536	coat and hat	453
foundation	355	steel	386	electric	175	robe	24
machine base	355	wall protection	444	floor units	174, 175	Hopper windows	300
manhole	637	wood	224	food	454	Hopper, rental	325
masonry	209, 213, 378	Handy box, electric	562	gas	535	Horizontal ladder, playground	467
mix, concrete	85	Hanger rod	518	gas wall furnace	176	Horns, paging	592

Hose	320	Ice plant	625	vermiculite	398	Jig saws, rental	328
air, rental	320	Ice storage unit	457	weatherstrip	421	Job site	
bibbs	522	ICF	86	Insurance		costs	314, 318
clamps	291	Identifying devices		bonding	185	engineer	313
fire, cabinet	493	for handicapped	478	contractor's	185	office	310
gate valves	523	signs	441	included in costs	3	office, temporary, rental	330
reel	449	I-Joist	41	liability	185	overhead	310
rental	325	Illumination, street	486	overhead	310	phone	319
Hospital		Illustrations, architectural	20	Insurance, labor cost		security service	265
cubicles	442	Impact windows	301	industrial & commercial	309	Job superintendent	314
freezers, refrigerators	469	Incandescent lighting	191	residential	10	Joint cleaning, pavement	612
Hot tub	245	Incline lifts	133	Interceptors, plumbing	528	Joint compound	168
Hot water generators,		Indicator		Interest rate	311	Joints	
hydronic	536	gauges	524	Interior doors	120	brick	209
Hot water heaters		posts	627	birch, flush	115, 116	expansion	85, 355
commercial	526	valves	523	café	118	form	345
connections	252, 527	Indirect overhead	310	fir	117	masonry	373
gas, rough-in	252	Induction cooktops	255	flush	116, 118, 119	mortar	209, 613
residential	248	Industrial wage rates	309	full louver	117	paving	613
Hot water heating	253, 537	Inertia sensors	589	half louver	117	sandblasting	612
pipe	494	Infiltration barrier		hardboard	115, 116	Joists	
Hot water storage tanks	529	house wrap	28	heater closet	119	bridges	159
Hot water supply	252	Infrared		hemlock, prehung	120	bridging	41
Hotmopping		elevator door	133	knotty alder	120	carpentry	38, 390
roofing	256	heater and fan	140	lauan	117	ceiling	46, 68
waterproofing	397	heaters	175	lauan, flush	116	ceiling, steel	68
Hourly wages		thermography	184	oak	117, 119	concrete	353
industrial & commercial	309	Inlet protection	604	oak, flush	116	demolition	103
residential	10	Inlets, curb	637	pine	117, 120	floor	34, 41
House paint	235	Insect screens	264	prehung	109, 119	floor or ceiling	38, 73
House street numbers	172	Inserts, concrete	355	Interior paint	235	forms	353
Housewrap	183	Inspection		Interior wall		hanger nails	230
Tyvek	28	building	26	assemblies	34, 57	I-joint	41
Housing, manufactured	480	pipe	629, 630, 631, 637	framing	63	painting	437
How to use this book	3	Instructions for this book	3	Interlocking paving stones	382	piecework rates	38
Hubs, lumber	205	Instrumentation, switchboard	570	Intermediate bracing		precast concrete	359
Humidifiers, wiring	128	Insulated service doors	416	steel framing	67	steel floor	59
Humus, peat	623	Insulated siding	400	Internet connection	130	steel framing	73
Hurricane		Insulating		Inverter system, solar	280	steel, piecework	73
protection	273	board	181	Investigation, soil	279	TJI	41
shutters	273	glass	166, 422	Iron		Jumbo brick	210
ties	161	roof deck	369	cast	387	Jumbo Tex	27
HVAC	535	skylights	277	embedded	355	Junction box, electric	542
ducting	482	Insulation	181, 897	wrought	388	Junior mesh	188
electric heaters	175	analysis	184	Iron worker, wage	309	<b>K</b>	
furnaces	176	asbestos, removal	338	Ironing boards	186	Kalman course	357
heat pump	178	board	398, 399	Ironwork		Keene's cement	244, 426
hybrid central heating	174	demolition	102	ornamental	150, 388	Key joints	339, 341, 345
hydronic heating	172	cellular Foamglass	399	railings	253, 386	Keyed wall form	342
mobile	464	cellulose	183	stairs, steel	387	Keypad	590
radiant floor heating	174	cold box	399	wrought iron	388	Keys, construction	170
residential	180	Corbond	184	Irrigation systems		Keyway form	88
stage	464	deck	369	commercial	618	Kick plates	
Hydrants	493	demolition	338	residential	188, 189	commercial	420, 421
demolition	334	encapsulated	181	sprinklers	621	residential	170
meter	312	expanded polystyrene	398, 399	Island cabinets	31	Kitchen	
Hydrated lime		FBX	183	Ivy	625	cabinets	29, 473
builders'	218	fiberglass	181, 397, 398		cabinets, installation	55	
soil conditioner	623	foil	183	fans, commercial	455		
Hydraulic		housewrap	183	sinks	248, 534		
door closers	105	masonry	183	sinks, rough-in	251, 531		
elevators	133	painting	437	Kneelers	461		
excavators, rental	323	panel adhesive	18	Kneewall cap	55		
jacks, rental	329	perlite	398	Knob, dummy	421		
truck cranes, rental	319	perlite board	399	Knockers, door	170		
Hydroblasting	239, 263	pipe	523	Kraft-faced insulation	397		
Hydronic		polysisocyanurate	398	<b>J</b>			
controls	172	polystyrene	181, 398, 399	Jackhammer	596		
heating	172, 537	pouring	183	rental	139, 320		
heating, floor	174	R-Gard	182	Jackposts	186		
hot water generators	536	rockwool	183	Jalousie window	299		
radiators	537	roof	399	Jamb			
Hydroseeding,		SAFB	183	exterior door	108		
subcontract	187, 624	sill gasket	182	side stripping	294		
<b>I</b>		sound control	183	window	53		
Ice and water shield	27	sound control board	398, 423	Jamb saws, rental	328		
Ice cream dispenser	454	subcontract	183	Jamb sets			
Ice maker	457	Super Tuff-R	398	finger joint	118		
Ice melting cable	561	testing	26	interior	118		
		thermal	397	solid clear pine	118		
		urethane sheathing	182	with hinges	118		
				James Hardie	274		
				Jelly jar light	585		
				Jetting wellpoints	602		
				Jib cranes	491		
				<b>L</b>			
				Lab refrigerators	469		
				Labor codes	10		
				Labor column defined	7-9		
				Labor costs			
				adjusting	4		
				crews	7-9		
				Labor costs defined	3		

Labor productivity .....	4	Luan doors .....	106	Lifting bi-fold closet .....	124	Loaders cranes, rental .....	322
Labor rates adjusting .....	11	flush interior .....	116	panels .....	364	crawler rental .....	323
industrial & commercial .....	309	flush prehung interior .....	118	Lifts dock .....	451	excavation .....	597
residential .....	10	molded face interior .....	117	elevators .....	133	grading .....	138, 139
Labor, painting .....	238	prehung heater closet .....	119	incline .....	133	rental .....	324
Lacquer thinner .....	238	solid core flush interior .....	116	rental .....	324	wheel, rental .....	323
Ladders attic .....	284	Laundry clothes chutes .....	491	>Loading docks concrete .....	354		
horizontal .....	467	clothesline units .....	84	equipment .....	451		
reinforcing .....	372	sinks .....	248	Loading trucks .....	600		
rental .....	326	tub rough-in .....	252	Loading trucks by hand .....	135		
rolling .....	459	Lava rock .....	381	Loan fees .....	311		
sliding .....	284	Lavatories .....	533	Local area network (LAN) .....	131		
steel .....	385	bases .....	290	Lockers .....	447		
Ladder-type wall reinforcement .....	372	cabinets .....	290	demolition .....	337		
Ladle rack .....	454	china .....	247	Locknuts, grounding .....	566		
Lag bolts .....	232	marble .....	208	Locks deadbolt .....	170		
Lag shields .....	555	rough-in .....	531	door, folding .....	122		
Lally columns .....	39, 58	vanities .....	290	garage door .....	165		
Lamb's tongue .....	253	Lawn lighting .....	191	Locksets .....	421		
Laminate shingles, architectural grade .....	258	rollers, rental .....	327	colonial knob .....	170		
Laminate wood flooring .....	157	seeding .....	187	commercial .....	421		
Laminated plastic cabinets .....	473	sprinkler system .....	188, 189	deadbolt .....	170		
countertops .....	96, 473	sprinklers .....	619, 621	door .....	53		
wallcoverings .....	435	Lay-in ceiling .....	81	egg knob .....	170		
Laminated sandwich panels .....	401	Layout .....	37	keyed entry .....	170		
Laminated wood, glued beams and timbers .....	396	engineer .....	310, 313	lever .....	170		
Lamp post wiring .....	129	foundation .....	189	mortise .....	170		
Lamps CFL .....	192	stakes .....	205	partition .....	443		
fixture .....	588	survey .....	313, 595	Lockwashers .....	232		
fluorescent .....	190, 582	typical costs .....	314	Log homes finish .....	236		
LED .....	192	Leach fields .....	265	floor system .....	193		
Landings concrete .....	476	Lead flashing .....	269, 404	labor .....	192		
forming .....	346	X-ray barriers .....	484	rafter systems .....	193		
stair .....	283, 397	Lead mesh fabrics .....	471	siding .....	200		
steel .....	385	Lead-based paint removal .....	233, 435	Log lap siding .....	201		
Landscape irrigation wiring .....	189	testing .....	26	Loudspeaker systems .....	592		
lighting .....	191	Leaf blower, rental .....	327	Louvered doors .....	120		
site curbs .....	95	Lease rate .....	581	Louvers access doors .....	253, 525		
Landscaping .....	624	Lecterns .....	460	door .....	417		
Lane delineator .....	22	LED accent lights .....	584	egg crate .....	80		
Lane spikes .....	450	LED down light .....	584	parabolic .....	81		
Lap cement .....	257, 258	LED light bulb .....	192	shutters .....	272		
Lap siding .....	275	LED lighting .....	192	vents .....	291, 292, 293, 406		
fiber cement .....	274	flood .....	585	windows .....	299		
spruce .....	201	LED linear light fixture .....	585	Low-boy, trash disposal .....	332		
Laser level, rental .....	328	LED panel lights .....	584	Low-pressure polyethylene pipe .....	629		
Latchsets commercial .....	421	LED vapor tight lights .....	585	Low-Sound bath fan .....	140		
passage .....	170	LED wall pack light .....	585	L-straps .....	163		
privacy .....	170	Ledger flashing .....	268	Lube rack .....	449		
Latex block filler .....	237	Ledgers .....	47, 391	Lumber alternative building materials .....	98, 99, 204		
deck, waterproofing .....	294	LEED air conditioning .....	180	boards .....	194, 196, 197, 198		
house paint .....	235	certification .....	536	building poles .....	204		
masonry paint .....	235	hydronic boilers .....	172	cedar .....	198		
painting, labor .....	238	Legal assistance, mobile .....	20	common .....	201		
primer .....	234, 294	Let-in bracing .....	44	eastern pine .....	197		
stain .....	236	Let-in ribbons .....	47	finish .....	194, 196		
stucco paint .....	235	Letter boxes .....	447, 448	finish trim .....	226		
Lath .....	425	Letter drop plate .....	420	framing .....	201		
demolition .....	335	Lettering, hand-painted .....	441	grading .....	205		
gypsum .....	187	Letters, signs .....	441	hemlock .....	195		
redwood .....	198	Levee excavation .....	603	inspection .....	205		
stakes .....	205	Levelers, dock .....	451	molding .....	226		
steel .....	188	Leveling flooring .....	154	oak .....	198, 222		
wood .....	205	Levels, rental .....	327	plywood .....	202		
Lather, wage industrial & commercial .....	309	Lever locksets .....	170	Ponderosa pine .....	197		
residential .....	10	Lexan .....	482	posts .....	204		
Lathing .....	425	L-flashing .....	268	recycled composite .....	98, 99		
Lattice molding .....	224	Liability insurance .....	185	recycled plastic .....	98, 204		
painting .....	240	Library ladders .....	459	red cedar .....	198		
		shelving .....	459, 472	southern pine .....	195, 196		
		Lift slabs .....	353	specialty .....	205		
				stakes .....	205		
				timbers .....	201		
				treated .....	201		
				treatment .....	207		

trim	226	Masking, surface prep	439	painting	436, 437	Modular	
wall sheathing	392	Masonry	220, 371	painting, preparation	239	brick	209, 210
West coast	195, 198, 201	acid-proof	375	pans, ceiling	82	cabinets	29
white pine	196	anchors	556	primer	234, 236	carpet tile	434
Luminaire	582	block	213, 378	roofing	260	Modulating valves	523
Luxury vinyl plank	154, 432	brick	373	screen doors	113	Moisture protection	253, 397
LVL Beams	396	cleaning	372	siding, painting	437	Moisture test, soil	279
LVP flooring	432	demolition	100	studs, demolition	335	Moisture-resistant drywall	168
<b>M</b>							
Machine bolts	232	fireplace	151	trim, painting	436, 437	Molding	
Machinery		furring	50	Metal detector	487	brick	108
appraisal	19	glass block	217	rental	329	cabinet	31
painting	436	insulation	183	Metal roofing	260	carpentry	55
Mahogany doors	107	joints	371	Metal-clad cable	560	cornice or crown	54
Mail		materials	220, 373	Metal-framed shaft walls	427	door	53, 108
chutes	447	mortar	219	Meter boxes	221, 573	fireplace	55
conveyors	491	nails	230	Meters		hardwood	222
drop plate	420	paint	235	electric	571	MDF	226
Mailboxes		painting	239, 438	fees	312	redwood	222
brass	447	parging	382	gas	638	softwood	223
commercial	447, 448	pointing	371	steam	524	stop	108
residential	207	preparation	239	water	312, 524	stucco	108
Male adapter		recycling	332	Met-tile	260	T-astragal	108
ABS	515	reinforcing	372	Microphone		vinyl	226
copper	512	sandblasting	263	public address	592	window apron	53
Man safes	263	sawing	370	stage	463	Monitor panels	591
Manager, office	310	steam cleaning	371	Microwave	456	Monitors, alarms	264
Manholes		surface prep	437	cabinets	31	Mono rock, concrete	357
covers	637	Mastercure	95	Midget louvers	292	Monolithic topping, concrete	357
cut-in	312	Mastic		Milano awnings	471	Monorail for electric hoists	490
demolition	333	adhesives	18	Milgard	299	Monuments, survey	313
electric pull boxes	542	painting	437	Milling, cold asphalt	611	Mop resilient floor	331
frames	636	roofing	257	Millwork, treatment	207	Mop sink	457, 534
precast	636	tile	288, 289	Millwright, wage		rough-in	531
repair	637	Mat reinforcing steel	349	industrial & commercial	309	Moped racks	475
rings	387	Material costs defined	3	residential	10	Morgue equipment	470
Manhours defined	4	Material demolition	337	Mortar	209		
Mannington flooring	153	Material handling systems	491	block	213		
Mansards, sheet metal	403	Material hoist	319	cement	82		
Mantels		Material lifts, rental	324	color	218, 613		
door and window	295	Mats		glass block	217		
fireplace	207, 208	entry	220, 473, 474	masonry	209, 218, 219		
labor	55	erosion control	603	mix	82		
marble	208	MC cable	560	paving	614		
Manual excavation	602	MDF molding	226	shower bed	272		
Manufactured housing	480	MDO plywood	203	testing	316		
Manure	623	Meat and deli case	454	tile	289		
Map display panel	480	Meat saw	454	trowel-ready	219		
Maple paneling	242	Mechanical drawing,		Mortise			
Mapping, aerial	313	architectural	126	hinges	172		
Marble		Mediation		lockset	170		
bases	381	fees	19	Mosaic and terrazzo worker, wage			
columns	381	mobile	20	industrial & commercial	309		
flooring	208, 381	Medical refrigerators	469	residential	10		
masonry	381	Medicare payroll taxes	285	Mosaic tile	288, 428		
setting	208	Medicine cabinets	220, 446	Moss preventer	268		
sills	296	Medium-density plywood	203	Motor			
specialties	381	Membrane		connection	567		
thresholds	381	detaching	94	generator sets	578		
tile	287	Ditra	94	starters	567		
vanity tops	97	poly film	253	Motor graders, rental	323		
Marble setter, wage		roofing	401	Motorcycle racks	475		
industrial & commercial	309	slab	94, 339	Motors, electric	566		
residential	10	underlayment	94	Movable partitions	443		
Margin, profit	208	waterproofing	294	Moving			
Marine		Mesh		excavated material	600		
adhesive	78	reinforcing	91, 349	stairs	490		
plywood	203	steel	91, 346	structures	338		
varnish	236	Message board,		Mud sills			
Markerboard, chalkboard	440	traffic control	326	anchors	59, 161		
Markers, road	616	Metal		Mulch			
Marking		aluminum screens	388	Mix all purpose	187		
parking lot spaces	616	buildings	483	Mulch			
pavement	616	door frames	414	Mullion casing	224		
Markup	310	fabricated	387	Murphy wall beds	25		
contingency	208	facing panels	401				
general contractor	5	lath	425				
project	310	ornamental	388				
subcontractor	5						

**N**

Nailer strip, carpentry	47, 390
Nailers, rental	327
Nailing sheathing	392
Nailite	277

Nails	
aluminum	231
box	227
brads	229
casing	229
coil	229
coil roofing	230
collated	229, 230
common	227
deck	228
drywall	229
duplex	231
finishing	230
framing	229
joist hanger	230
masonry	230
plasterboard	230
scaffold	231
screw shank	229
siding	231
sinkers	228
stainless steel	230
stick	229
vinyl-coated	228
Napkin dispenser	445
Narroline patio doors	121
Natural gas	
meter	638
rough-in	252
NCX treatment	207
Needle gun finish	356
Needle scaling paint removal	233
Neo-angle shower	272
Neoprene	
gaskets	403
joints	412
weatherstrip	421
Nets	
safety, scaffolding	329
tennis	466
Netting, stucco	188
Network cable	130, 459, 460
Networking systems	131
Networks	
educational	459
residential	130
Newel	
posts	56, 253, 281, 282, 283
NFPA fire sprinklers	150
NM-B cable (Romex)	559
Noise analysis	134
Non-metallic	
cable (Romex)	559
conduit, flexible	553
Non-slip strips	220, 432
Norman	
brick	209, 210
pavers	212
Nosing	
flooring	155
sill	286
steel	387
Nozzle, sandblast, rental	325
Numbers, house	172
NuTone	140, 141, 254
Nuts, hex head	232
Nylon carpet	76, 433
Oak	
boards	198
doors	116
flooring	155, 430
molding	222
paneling	242
parquet	158
plywood	203
threshold	108, 222, 286
Obstruction lighting	586
Octagonal window	303
Office	
clerk	310
expenses	310
job site, temporary, rental	330
manager cost	310, 314
overhead	208
partitions	443
Offices	
manufactured	480
temporary	310
temporary, rental	330
Oil	
concrete form	355
storage tanks	540
Oil and latex stain	236
Oil-based	
enamel	236
exterior primer-sealer	234
stain	236, 237
Olefín carpet	76
Openers, garage door	164
Openings	412
Operating engineer, wage, residential	10
Orchard clearing	594
Organic impurities	314
Ornamental	
fence	149
gates	165
metals	253, 388
railings	386
rock	604
screens	388
OS&Y valves	492, 519
OSB (Oriented Strand Board)	275
Paneling	302
panels	203
roof panels	392, 393
roof sheathing	194
sheathing	42, 51, 63, 391, 392
siding	275
subfloor	42, 63
Osmosis filters, water	529
Outdoor lighting	191, 588
Outlet boxes, electrical	561
Outlet circuit receptacle	542
Outlets, electric	129, 563
Outside corner molding	226
Ovens	
built-in	255
cabinets	30
commercial	456
convection	456
electrical work	129
microwave	456
pastry	456
residential	255
Overhang, painting	240
Overhead	
costs	310
markup	208
Overhead doors	415
Overhead electrical distribution	577
P	
PA (Public Address) system	464
Padre brick	210
Pads	
carpet	76
equipment	352
Paging systems	592
Paint	
pool coating	237
removal	233, 435
remover	237
testing	26
textured	235
thinner	238
traffic	237
Painter, wage	
industrial & commercial	309
residential	10
Painting	241
athletic courts	467
cleaning, prep with power tools	436
cleanup	331
clear finish	236
compressors for spray painting	239
concrete	437
conduit	437
cost breakdown, subcontract	239
curbs, red	616
deck	437
door frames	240, 241
epoxy	437, 438
exterior	238, 241
exterior latex	235
fence	240
floor	438
handrails	438
industrial	436
interior	235, 238, 241
interior prep	439
joists	437
latex	235
latex exterior	235
masonry	235, 438
mastic	437
oil stain	237
pipe	437
pool	438
porch	438
porch and floor	235
roof	257
rule of thumb, subcontract	239
sandblasting	263
shingles	438
siding	437, 438
speed bumps	610
spheres	437
spray	239
sprayers, rental	328
stain	237
steel	436
stucco	235, 437
subcontract	239
surface prep	436, 437
swimming pool	438
tanks	437
urethane finish	236
varathane finish	236
waterproofer	237
waterproofing	236
wood deck	438
wood finish	236
wood preservative	237
Paling, rail	99
Pan forms	345
Pan racks	456
Panel	
adhesive	18
box, wiring	129
circuit breaker	575
enclosures	563
molding	224
Panel lights, LED	584
Panel roofing	
steel	260
Panelboards, electrical	572
Paneling	
beaded	242
birch	242
cedar	79, 242
FRP	243
Golden Virola	242
hardboard	242, 435
hickory	242
maple	242
oak	242
pine	242
red oak	242
sound reduction	464
vinyl-clad	243
wainscot	242
wall	54
Z-brick	243
Panelized	
roof system	392
shingle siding	276
Panels	
breaker	572
fiberglass	150
greenhouse	150
light-diffusing	80
polycarbonate	150
radiator heating, ceiling	175
roofing, solar	280
sun	150
wood walls	394
Panic button	264
Panic door hardware	171, 421
Pans, water heater safety	526
Pantry cabinets	30
Paper	
building	27, 28
dispensers	445
roofing	258
wallcover	434
Paperhanging	293, 434
Parabolic louvers	81
Parapet	
coping	268
forms	353
reglet	365
Pargeting, masonry	382
Parging	
masonry	382
Park	
benches	474
grills	469
surveillance	486
Parking	
access control	450
blocks	617
bumper	615
control equipment	450
handicapped symbol	616
lot, paving	610
reflective lines	616
stalls, for handicapped	477
traffic symbols	616
Parquet flooring	158, 430
Particle emissions reduction, pollution control	581
Particleboard	204
carpentry	395
underlayment	395
Parting bead	224
Partitions	
cubicles	442, 443
demolition	335
dust control	337
fire rated	444
folding doors	443
framing, piecework	37, 73
framing, steel	73
marble, toilet	381
metal	442, 443
non-bearing	443
office	443
toilet	442
wire	444
Passage latch	170, 421
Passenger elevators	489
Passive solar heat	249
Paste wood filler	238
Pastry oven	456
Patch panel	460
Patching	
concrete	95, 365
Path lighting	191

Patio	
blocks	613
carports	77
cover	21
roof	99
tile	220
Patio doors	121, 122
aluminum	120
fiberglass, swinging	122
gliding, vinyl	121
hinged, vinyl-clad	120
pet	122
sliding wood	121
steel, double	122
swinging, double	120
vinyl	121
Pavement	
asphaltic	243
breakers, rental	320, 325
concrete	84, 94, 244, 611
demolition	102, 332
line marker, rental	325
line markings	616
marking, removal	333
sawing	371
stripers, rental	325
striping	616
sweeping	612
symbols	616
Paver	
Turfstone	615
Pavers	
brick	212, 382
bullnose	212
concrete	215, 382
interlocking	382
landscaping	613
masonry	613
masonry grid	382
mexican	288
rubber	467
slate	382
split	212
terrazzo	382
Paving	
asphalt	243, 609, 610
brick	243, 612
cold milling	611
concrete	84, 94, 244, 611
demolition	102, 332
equipment rental	325
grass	244, 615
joint treatment	613
machine, rental	325
parking lots	610
repair	611
stones	382
subcontract	243
systems	244, 615
Turfstone paving	615
Payment bonds	186
Payroll taxes	285
PCBs, removal	435
Pea gravel	18
concrete	85
landscaping	625
riprap	604
Peat humus	623
Pedestal flooring	434
Pedestrian bridge	487
Peep sights	171
Pegboard, hardboard	435
Penetrating stain	236
Penny nail sizes, defined	227
Pension costs defined	3
Penta treated post	204
Percolation testing	265
Percolator, coffee	458
Perforated pipe	632
Performance bonds	186
Pergo wood flooring	157
installation kit, rental	326
Pergola	99
Perimeter door seal	452
Perimeter wall insulation	182
Perling, steel	72
Perlite soil conditioner	623
Permanent bond adhesive	258
Permits	
building	28
well drilling	295
Pest control	
soil treatment	280
wood treatment	207
Pet	
doors	122
enclosures	143
screen	123
Petroleum storage tanks	540
Pews	460
PEX pipe	509
PEX-AL pipe	511
Pharmacy refrigerators	469
Phone support	5
Phones	
temporary	310
wiring	591
Photo mapping, aerial	313
Photo micrographs	317
Photoelectric	
sensors	589
switches	565
Photographs	
aerial	313
construction	318
retouching	318
Photovoltaic systems	582
Picket fence	148, 149
painting	240
Pickling stain	237
Picture frame molding	224
Picture rail	55
Picture window	299
Pictures, job site	318
Piecework	
metal carpentry, floor sheathing	74
metal carpentry, rafters	75
metal carpentry, roof framing	74
metal carpentry, roof sheathing	76
rough carpentry	37
rough carpentry, floor sheathing	38
rough carpentry, roof sheathing	39
steel framing	73
Pier	
blocks	39
caps	389
pads	39
Pilasters	134
cabinets	31
molding	55
painting	240
Pile caps, concrete	340
Pile driver, wage	
industrial & commercial	309
Pile driving	606
Pile driving, rental	322
Pile foundations	606
Piles	
landscaping	625
treatment	206
Piling, sheet steel	605
Pine	
building poles	204
decks	98
eastern	197
flooring	155, 156
jamb sets	118
lumber	197
paneling	242
Ponderosa	197
siding	199
southern	195, 196
stakes	205
timber	202
white	196
Pipe	
ABS	126, 512
asbestos removal	338
black steel	494
bollards	616
cast iron	626
clamps	518
clay	635
cleaning	630, 631
columns	384
concrete	631, 632
conveyors	491
copper	503, 512
corrugated metal	633, 634
corrugated polyethylene	631
CPVC	507, 508
culvert	633
cutters, rental	328
demolition	333
drainage	126, 512
ductile iron	628
DWV	512
elliptical	632
equipment rental	328
fire protection	508
foundation drains	126
gas	252, 638
grouting	637
guard	365
guides	518
inspection	629, 630, 631
insulation	523
insulation, asbestos removal	338
insulation, painting	437
jacking	638
levels, rental	328
locating	266
markers	318
painting	437
perforated	631, 632
PEX	509
PEX-AL	511
piles	608
plastic	126
Polyethylene	126, 618, 621, 638
Polyethylene corrugated	634
PVC	512
PVC Schedule 40	506, 620
PVC Schedule 80	506
PVC sewer pipe	266
railing	386
rolls	518
sewer	265
sewer, PVC	630
sterilization	629
storm	632
straps	518
troubleshooting service	266
TV inspection	637
valves	523
Vitrified clay	266
water, PVC	628
Pipefitter, wage	
industrial & commercial	309
Piping, gas	252
Pitch pockets	404
Pits, excavation, dug by hand	136
Pizza preparation unit	454
Placing concrete	95, 349
Plan check fee	28
Plank	
flooring	56, 155
precast concrete	358
scaffold, aluminum extension,	
purchase	330
Plank flooring	
vinyl	432
Plans	25
Plants, landscape	624
Plaques	442
Plaster	
accessories	426
demolition	102, 335
ground	224
joints	412
labor	244, 426
mixer, rental	321
painting	241
ring	561
soffits	244
stucco	427
Plasterboard	
drywall	423
nails	230
Plasterer, wage	
industrial & commercial	309
residential	10
Plasterer's helper, wage	
industrial & commercial	309
residential	10
Plastering	244, 426
fireproofing	409
stucco	427
Plasterkraft	27
Plastic	
countertops, laminated	473
drain pipe	126
forms	86, 87
laminate	435
lumber	99, 204
resin glue	18
sewer pipe	266
shutters	272
siding	276
skylights	277
speed bumps	617
tarp	285
tile	429
vapor barrier	253, 352, 353
Plasticized concrete	85
Plate straps	163
Plates	
carpentry	40, 58, 390
carpentry piecework	42, 68
door hardware	170, 421
electrical	565
splash	255
switch	23
Platform lifts	
dock	451
rental	324
Platform, scaffold, purchase	330
Playground equipment	467
Playing fields, synthetic	465
Plenum cable	593
Plexiglas	167, 422, 480
Plinth block, MDF	226
Plugmould	557
Plugs	
cleanout	516
electrical	564
test	515
Plumber, wage	
industrial & commercial	309
residential	10
Plumber's flash cone	404
Plumber's tape	518
Plumbing	494
access doors	253, 525
area drains	525
assemblies	251, 530, 532
cleanouts	525
copper DWV	512
equipment rental	328
fixtures	535
fixtures, cleaning	83
floor drains	525
for handicapped	478
piping	532
roof drains	525
rough-in	251, 532
systems	251
water softener	250
Plyclips	162
Plyform	203, 339

Plywood.....	203, 391	Polyisocyanurate insulation.....	182, 398	Pour-stop forms.....	340, 342	Propane furnaces.....	176
backboard.....	460	Polypropylene mesh reinforcing.....	85	Powder-driven fasteners.....	231	tanks.....	541
birch.....	203	Polystyrene board.....	398	Power cable.....	560	water heaters.....	249
'board-up'.....	274	insulation.....	181, 182, 398, 399	conduit.....	543	Property boundaries.....	313
cap molding.....	226	insulation board.....	398	distribution.....	577	Provista range hood.....	254
cedar.....	203	roof deck.....	399	EMT.....	547	P-traps, ABS.....	516
ceiling.....	54	Polyurethane floor finish.....	56	generation.....	131, 582	Public address systems.....	464, 592
deck, waterproofing.....	294	insulation.....	184	panels.....	572	Pull box, electrical.....	542, 562
demolition.....	102	paint.....	236	solar.....	582	Pull plates.....	170, 421
exterior.....	202	painting.....	438	temporary, pole rental.....	310, 318	Pulls, edge, pocket door.....	171
fence.....	331	sealant.....	410	underground.....	541	Pulpits.....	460
forms.....	88, 339	Ponderosa pine boards.....	197	Power factor meter.....	571	Pump mix concrete.....	85
framing clips.....	162	lumber.....	197	Power generator exhaust stack.....	581	Pumper firehouse connection.....	493
lumber.....	202	mantels.....	208	Power ventilators		Pumping	
marine-grade.....	203	Pool, swimming coating.....	237	attic gable.....	142	concrete.....	350, 351
MDO.....	203	complete installation.....	475	roof-mount.....	142	dewatering.....	602
oak.....	203	cover.....	476	Precast beams.....	359	well.....	295
paneling.....	242, 392	deck.....	369	columns.....	359	Pumps	
piecework rates.....	39, 74	fences.....	150	concrete.....	357, 633	electrical connections.....	129
roof panels.....	392	gunite.....	357	culvert.....	633	foundation.....	366
sheathing.....	42, 51, 62, 391	heaters.....	250	double tees.....	360	gasoline.....	449
sheathing, piecework.....	39, 76	painting.....	237, 438	drains.....	634	rental.....	324
siding.....	203, 275	resurfacing.....	369	floor plank.....	358	sewer.....	265
softwood.....	202	Popcorn ceiling.....	169	floor slab.....	358	sump.....	528
structural.....	203	Poplar flooring.....	155	girders.....	359	sump, wiring.....	129
subfloor.....	42, 62	Pop-up sprinklers.....	189	joists.....	359	wiring.....	130
subfloor, piecework.....	39, 76	Porcelain tile.....	287	manholes.....	636	Punch down, network cable.....	460
treatment.....	207	Porch columns.....	84	panels.....	357	Punch-down blocks.....	593
underlayment.....	432	enamel.....	235	stairs.....	360	Purlins	
window covering.....	274	enclosed.....	167	Precipitators.....	455	anchors.....	161
Pneumatic demolition.....	103	lifts.....	133	Pre-engineered buildings.....	483	carpentry.....	48, 390
door closers.....	105	painting.....	240, 438	Preformed siding.....	400	fireproofing.....	410
excavation.....	138	posts.....	84	Prehung doors.....	52, 118-120, 415	hangers.....	161
hammer.....	596	rail.....	253	double.....	119	steel.....	383
pipe systems.....	491	Porous paving.....	244	exterior.....	109-111	steel framing.....	72
tampers.....	599	Portable structures.....	480	fire-rated.....	109	Purse shelf.....	442
tools, rental.....	320	Portable toilet (Port-a-Potty).....	310	French.....	120	Push plates.....	170, 421
tube systems.....	491	Portland cement.....	82	heater closet.....	119	Putty, glass.....	239
Pocket doors.....	171	Post		oak.....	119	PV (photovoltaic)	
hangers.....	171	anchors.....	163	patio, steel.....	121	solar equipment.....	280
hardware.....	53, 171	bases.....	162	steel.....	111, 112, 414		
kit, converging.....	171	caps.....	163	Preliminary soil investigation.....	279		
Pointing, masonry.....	371	column forms.....	340	Prepare surface,			
Poisoning soil.....	280	indicators.....	627	painting.....	239, 437, 439		
Poles		painting.....	438	Presentation			
building.....	204	Post holes.....	144	board.....	440		
closets.....	55	fences.....	617	Preservation, lumber.....	207		
concrete.....	360	footings.....	617	Preservative, wood.....	237		
cross arms.....	577	Postal specialties.....	447	Pressure			
demolition.....	334	Posts		controls.....	524		
flag.....	448	athletic equipment.....	465	gauge.....	524		
foundations.....	587	barrier.....	452	grouting.....	357		
job sign.....	318	bollards.....	616	mats.....	264		
lighting.....	587	building.....	204	regulators, gas.....	638		
lumber.....	204	cabinet.....	31	regulators, hydronic heating.....	539		
playground.....	467, 469	carpentry.....	39, 45	treatment, lumber.....	207		
power distribution.....	577	deck.....	99	vacuum breaker.....	312		
pressure-treated.....	205	fence.....	144	Pressure washer, rental.....	328		
removal.....	334	guardrail.....	615	Pressure washing.....	239, 436		
temporary utility power.....	318	jackposts.....	186	Pressure-reducing valves.....	522, 539		
treatment.....	206	newel.....	56	Pressure-treated lumber.....	201		
Polishing		porch.....	84	Prestressed concrete.....	360		
floors.....	238	pressure-treated.....	205	Prime coat, pavement.....	611		
woodwork.....	241	redwood.....	204	Primer			
Pollution control.....	579, 581, 604	sawn.....	204	asphalt.....	466		
Poly E Pipe.....	621	treatment, lumber preservation.....	206	clean metal.....	236		
Polybutylene tape.....	412	yellow pine.....	204	linseed.....	234		
Polycarbonate		Pot hooks.....	454, 456	metal.....	236		
glazing.....	482	Pot racks.....	456	painting.....	239		
sheets.....	166, 423	Pot wash sink.....	457	sealer, oil-based.....	234		
skylights.....	277	Pour strip, tilt-up.....	362	Prints, plans.....	25		
Polyester fabric.....	257	Pouring		Privacy latchset.....	170		
Polyethylene		concrete.....	95, 351	Processed lime.....	218		
corrugated pipe.....	634	insulation.....	183, 398	Profit, markup.....	208, 310		
film.....	253	Project		cost adjustments.....	12-15		
gas pipe.....	638	coating.....	182, 398	financing.....	311		
membrane, slab.....	94, 339, 352, 353	insulation.....	183, 398	manager cost.....	310		
pipe.....	126, 618	Pour-strip, tilt-up.....	362	scheduling.....	311		
tarps.....	285	Polyisobutylene					
tilt-up.....	362	backboard.....	460				
Poly-faced insulation.....	181	birch.....	203				
Polyisobutylene.....	412	'board-up'.....	274				

ladle.....	454	Rebar	348	Riprap.....	604
pots and pans.....	456	chairs.....	348	Risers	
towel.....	24	concrete.....	89, 346	concrete stair.....	95, 351, 360
Racks, security		epoxy-coated.....	346	concrete stair, forming.....	346
bicycle.....	475	footings.....	346	flagstone.....	216
motorcycle.....	475	masonry.....	372	masonry.....	216
Radial wall forms.....	342	rings.....	348	rubber.....	220
Radiant heat, floor.....	174	slabs.....	346	sprinkler heads.....	189
Radiant heating.....	175, 479	splicing.....	348	stair.....	56, 283
Radiation protection.....	484	stirrup.....	347	steel stairs.....	282
Radiators, heating.....	537	Receptacles, electric.....	129, 563	wood stairs.....	281, 396
Radio studio.....	488	cover plate.....	565	RO filters, water.....	529
Radioactivity, removal.....	435	outlet circuit.....	542	Road	
Radon gas, testing.....	26	wiring.....	129	compaction.....	603
Rafters.....	36, 390	Recessed lighting.....	191	equipment rental.....	325
bay vent channel.....	292	Re-coat		grading.....	596
demolition.....	103	roofing.....	402	paving.....	610
log.....	193	Recording meters.....	571	repairing.....	611
piecework rates.....	39	Recycling fees.....	332	rollers, rental.....	321
rough carpentry.....	47	Red cedar		striping.....	616
spacing.....	292	beams and timbers.....	201	trim and finish.....	603
steel framing.....	70	boards.....	198	Road closed sign.....	22
steel, piecework rates.....	74	fence.....	148	Road plate, steel.....	325
timber.....	193	lumber.....	195	Robe hooks.....	24
vents.....	292	shakes.....	259	Rock	
Rail		shingles.....	259	aggregate.....	18
communion.....	461	siding.....	199	cinder.....	604
fence.....	145, 148	Red oak		drain rock fill.....	604
guard.....	331	boards.....	198	drilling.....	595
hand.....	150	closet doors.....	124	drills, rental.....	320
molding, cabinets.....	31	doors.....	117	excavation.....	135
painting.....	438	Red oxide primer.....	234	fill.....	604
stair.....	283	Red rosin sheathing.....	27	ornamental.....	604
Railing		Reducer strip, flooring.....	155	recycling.....	332
access flooring.....	434	Reducer, drain pipe.....	126	ripping.....	596, 601
aluminum.....	386	Redwood		Rock fill drainage systems.....	126
brass.....	386	benderboard.....	187, 625	Rockwool insulation.....	183
for handicapped.....	476	deck stairs.....	99	Rod clamps.....	554
highway.....	615	decking.....	98	Rod hanger.....	554
painting.....	238, 240	fascia.....	49	Rod, threaded.....	161
patio deck.....	99	fence.....	147, 148	Rods	
porch, steel.....	253	headers.....	615, 625	lightning.....	129
stair.....	56	lumber.....	195, 198, 201	shower curtain.....	24
stair, wood.....	281, 397	molding.....	222	Roll flashing	
steel.....	253, 386	saunas.....	264	copper.....	267
temporary.....	331	siding.....	199	galvanized.....	268
tubular.....	386	strips, chain link.....	142	lead.....	269
wrought iron.....	386	treads.....	99	paper-backed copper.....	268
Railroad demolition.....	334	Reflective signs.....	617	ridge roll.....	260
Rain diverter.....	268	Refrigeration, insulation.....	399	valley.....	268
Rain gutter		Refrigerators		vinyl.....	270
stainless.....	406	backbar.....	457	Roll roofing.....	401
steel.....	406	electrical work, subcontract.....	129	adhesive.....	258
Rain gutters.....	167	food service.....	457	felt.....	257
Raingear, copper.....	405	medical.....	469	fiberglass.....	257
Raised floors.....	434	morgue.....	470	mineral surface.....	257, 259
Rammers		wiring, subcontract.....	129	papers.....	258
compacting.....	599	Reglet		Roller, dough.....	456
rental.....	321	copper.....	268	Rollers, rental.....	321
Ramp forms, riser.....	346	parapet.....	365	Rolling	
Ramps		Regulator valves.....	523	ladders.....	459
access flooring.....	434	Regulators, pressure, hydronic		Rolling platform lifts, rental.....	324
handicapped.....	476	heating.....	539	Rolling towers, rental.....	324
rental.....	329	Reinforcing		Roll-up	
Range circuit.....	543	bar supports.....	340	doors.....	415
Range hood.....	253, 254	bars.....	89, 346, 365	window blinds.....	296
convertible.....	254	caissons.....	349	Roll-up awning.....	21
custom.....	254	chairs.....	348	Romex cable.....	127, 542, 559
food service.....	455	columns.....	349	Roof	
vented.....	253	demolition.....	332	apron.....	268
Range support, cabinets.....	31	fiber mesh.....	85	bay window.....	304
Ranges		foundation.....	346	built-up.....	256
electrical work.....	129	gunite.....	357	cant strips.....	50, 182, 403
gas, commercial.....	456	masonry.....	215	coating.....	237, 256, 257, 401, 402
residential.....	255	masonry ties.....	159	cold, for log home.....	194
Rastral Block.....	87	mesh.....	91, 349	deck cover.....	99
Rates, labor.....	7- 9	mesh mini-mat.....	349	deck, cementitious.....	403
Rattan black paper.....	27	pavement.....	244	deck, concrete.....	369
Reactivity testing.....	314	rings.....	348	deck, steel.....	384
Ready-mix concrete.....	84, 350	slabs.....	92, 346, 349	deck, wood.....	392, 403
				demolition.....	102

drains .....	525	Rosin sheathing .....	27	steel framing .....	56	Saw, meat .....	454
edge .....	267, 268, 270	Rotary roof ventilators .....	292, 407	Runners .....	220, 473	Saw, rental .....	
edging .....	267	Roto hammer, rental .....	326	mats .....	220	chain saw .....	139
EPDM .....	402	Rototilling .....	187, 623	rubber .....	220	concrete .....	321
flashing .....	27, 268, 269	Rough carpentry .....		Running track .....	465	Sawing .....	
framing .....	36, 39, 47, 74	adhesive .....	18	Runoff protection .....	604	asphalt .....	371
framing, panelized .....	392	anchors .....	59	Rust-converting metal primer .....	236	concrete .....	362, 370
framing, steel .....	70, 74	backing and nailers .....	47	Rustic siding .....		masonry wall .....	370
ice melting cable .....	561	beams .....	45	cedar .....	199	Sawn posts, redwood .....	204
insulation .....	399	blocking .....	41	pine .....	200	Saws, rental .....	328
insulation board .....	399	bracing .....	44	Rust-inhibiting primer .....	234	wood .....	328
jacks .....	526	cant strips .....	50	Ryegrass seeding .....	624	SBS .....	
joints .....	392	ceiling joists .....	46	roll roofing .....	257		
loading .....	262	collar beams .....	48	starter strip .....	258		
membrane .....	256	collar ties .....	48	Scaffolding .....			
paint removal .....	233	columns .....	39	caster-mounted, purchase .....	330		
painting .....	240, 438	columns, steel .....	58	erection .....	329		
pan .....	268	curbs .....	48	jacks .....	356		
panels .....	392	demolition .....	103, 334	nails .....	231		
paper .....	27	door openings .....	43	planks, purchase .....	330		
patio .....	99	dormer studs .....	48	rental .....	329		
safes .....	404	fascia .....	49	safety equipment, purchase .....	330		
sheathing .....	49, 392, 403	fireblocks .....	45	swinging, purchase .....	330		
testing .....	316	floor joists .....	40	Scaffolding, mobile .....			
tile, concrete .....	261	floor trusses .....	41	rental .....	329		
trusses .....	48, 72, 395	furring .....	50	Scales, truck .....	452		
trusses, piecework rates .....	38, 74	girders .....	40	ScapeWel window .....	305		
underlay .....	27	ground (stucco stop) .....	51	Schedule 40 PVC pipe .....	506		
vent kit, bath .....	141	joists .....	46	Schedule 80 PVC pipe .....	506		
vent, turbine .....	141	ledgers and ribbons .....	47	Scheduling .....			
vents .....	292	plates .....	42, 68	costs .....	311		
windows .....	279	posts .....	39, 45	CPM .....	134, 311		
<b>Roofer, wage</b>		purlins .....	48	fees .....	134, 311		
industrial & commercial .....	309	rafters .....	47	overhead .....	310		
residential .....	10	ribbons .....	47	School equipment .....	458, 467		
<b>Roofing</b>		roof decking .....	50	School network .....	459		
algae-resistant shingles .....	258	roof sheathing .....	49	Scissor lifts .....	451		
asphalt .....	257, 258	roof trusses .....	48, 49	Scissor lifts, rental .....	324		
assemblies .....	37	sill plates .....	40, 58	Scoreboards, gym .....	464		
base sheet .....	256, 257, 258	stucco stop (grounds) .....	51	Scoring concrete .....	356		
built-up .....	256, 401	subflooring .....	42	Scrapers .....			
cant strips .....	50, 182, 403	trimmers .....	48	excavation .....	601		
cement .....	256, 258	wall sheathing .....	51	rental .....	323		
clay tile .....	261	window openings .....	44	Scraping metal to prepare for .....			
concrete tile .....	261	Rough hardware, plywood clips .....	162	painting .....	436		
copper .....	404	Rough-in .....		Scraping, paint .....	239		
corrugated .....	260, 400	appliances, gas .....	252	Scratch coat, plaster .....	244, 427		
demolition .....	102	bathtub .....	531	<b>Scree</b>			
EPDM .....	402	drinking fountain .....	531	concrete .....	362		
felt .....	257, 258, 401	floor drain .....	532	concrete, rental .....	322		
fiber cement slate .....	261	lavatories .....	531	lath .....	188		
fiberglass panels .....	150	service sink .....	531	plaster or stucco .....	51		
galvanized .....	260, 400	shower .....	531	rental .....	322		
gravel .....	256	sink .....	531	tilt-up .....	362		
membrane .....	256	toilet .....	530	Screen .....			
metal .....	260	urinal .....	530, 531	bead molding .....	225		
nails, coil .....	230	water closet .....	530	block, masonry .....	215, 380		
nails, galvanized .....	230	Rough-sawn siding .....	275	masonry .....	380		
nails, plastic cap .....	231	Round molding .....	225	ornamental .....	388		
paper .....	258	Router-groover, rental .....	325	patio door .....	121		
photovoltaic .....	280	Routers, rental .....	328	projection .....	458		
red cedar .....	259	RSC conduit .....	543	sight .....	615		
roll .....	257	Rub .....		solar .....	264		
rule of thumb costs .....	255	carborundum .....	95, 356	sun .....	388		
shake .....	259	concrete finish .....	95, 356	tear-resistant (pet) .....	123		
sheet .....	260	Rubber .....		urinal .....	442		
sheet metal .....	260, 403	flooring .....	432	vent .....	291, 292, 406		
shingles .....	259	mats .....	220	window .....	300		
slate .....	260	studded tile .....	154	wire .....	264		
solar .....	280	tile .....	432	<b>Screen doors</b> .....	113		
Spanish tile .....	261	Rubber roof coating .....	402	closer .....	105		
staples .....	231	Rubberized asphalt .....	611	hinges .....	172		
steel panel .....	260	Rubble, masonry .....	381	metal .....	113		
system .....	403	Rugs, carpet .....	76, 433	security .....	113		
tar .....	256	Rule of thumb costs .....		vinyl .....	113		
tile .....	261	carpentry .....	32	wood .....	113		
Roof-mount power ventilator .....	142	electrical work .....	127	<b>Screw guns, rental</b> .....	327		
Roof-to-wall flashing .....	268	hardware .....	420	<b>Screw shank nails</b> .....	229		
Room dividers .....		residential construction .....	307	<b>Screw-base lights</b> .....	191		
doors, folding .....	444	roofing .....	255	<b>Screwdrivers, rental</b> .....	327		
partitions .....	444			<b>Screwjacks, rental</b> .....	329		
Rope climb, playground .....	467						

Screws	573	Sheet glass	166, 422	Shot fasteners	231, 390
drywall	229	Sheet metal	403	Shovels, earthwork	135
self-tapping	150	access doors	266	Shower	
Scribe molding, cabinets	31	ducts	177	caulk	78
Scrub sink	535	flashing	260, 267	compartments	442, 533
rough-in	531	gutters, downspouts	167	doors	271, 442
Scullery sink	457	hoods	270	emergency	531, 534
Sculpture screens	215	roofing	260, 403	enclosures	272
Scuppers, sheet metal	406	siding	276, 400	grab bars	247
Scuttle, roof	407	vents	406	handicapped access	247
SDR 11 CPVC pipe	507	Sheet metal worker, wage		mortar bed	272
Seal coat		industrial & commercial	309	plumbing	533
asphalt	243, 611	residential	10	receptors	272, 443, 533
roadway	611	equipment	449	rod	24
Sealant pot, rental	325	hydraulic hoist	450	rough-in	531
Sealants		submerged turbine	449	seat	25
caulking	77, 410	turbine	449	stalls	246, 272, 443, 533
caulking gun	79	Serving fixtures	453	stalls, cleaning	83
concrete	77	Serving table, sushi	454	Shower stalls	246
deck	98	Settlement testing	279	Shrinkage defined	3
door	78	Sewage		Shrubs	625
driveway	237	ejectors	265, 528	Shunt trip	571
elastomeric	78	leaks	266	Shutters	
gutter and flashing	78	pumps	265	accordion-type	273
marine	78	Sewer		Bahama-type	273
paint	236	connection	266	colonial-type	273
primer	234	demolition	333	co-polymer	272
siding	78	pipe, PVC	630	exterior	273
silicon rubber	78	pump systems, residential	265	hurricane	273
sill	182	snakes, rental	328	louvered	272
tub	79	systems	265	panel-type	273
wall	79	Sewer lines	266	plywood	274
window	78	cleaning	630	roll-up	273
Seals, weatherstrip	294	demolition	333	Siamese connection	493
Sealtite conduit	553	Shacks, storage, rental	330	Sidelites	
Seasonite wood preservative	237	Shades		steel door	111
Seat cover dispensers	445	blinds	296	Sidewalks	
Seating		cellular	297	asphalt	615
athletic	466	Shades, window	296	concrete	84, 94, 244, 611
gym	464	Shaft drilling,		cover	331
school	458	caisson foundations	608	demolition	100, 101, 332
shower	25	Shaft walls	427	moving	490
stadium	474	Shake felt	259	Siding	
theater	474	Shakertown siding	276	aluminum	276, 400
Security		Shakes, roofing	259	cedar	199
access, keypad	590	Shale, excavation	596, 601	corrugated	276, 400
alarm systems	589	Shaping slopes by hand	136	demolition	102
alarms	264	She bolts	355	exterior trim	275
controls	591	Shear gate	627	fascia	275
gates, folding	115	Shear panels		fiber cement	274
gratings	388	piecework rates	38	galvanized steel	276
grilles, doors	416	steel framing	74	hardboard lap	275
guards	265	Sheathing		hardboard panel	274
locks	171	adhesive	18	Hardi products	274
monitor panels	589	board	42, 51	insulated	400
systems	589, 591	carpentry	63	lap	201, 274
television system	592	carpentry piecework rates	76	log cabin	200, 201
Security doors	113, 115	clips	162	Nailite	277
Sediment control	604	cork	435	nails	231
Sediment fence	604	demolition	102, 335	OSB	275
Seeded aggregate finish	244, 615	Dens Glass	182	paint preparation	239
Seeding		floor	34, 38	paint removal	233
grass	624	framing, steel	74	painting	240, 437, 438
landscaping	187, 624	gypsum board	168	pine	199, 200
Seekure paper	28	insulated	182	plywood	203, 275
Seesaws	468	insulation board	182, 399	redwood	199
See-thru frames	418	lumber	392	resin	277
Seismic ties	161	OSB	42, 51, 391	sealant	78
Self-leveling compound	154	paper	27	shingle	276
Self-storing storm doors	114	piecework rates	39	soffit vents	292
Self-tapping screws	150	plywood	42, 49, 51, 391	southern yellow pine	199
SensAire wall control switch	141	roof	49, 392, 403	thermoplastic	277
Sensor cable, electric	589	skip	395	vinyl	276, 401
Sensors		steel framing	62	western red cedar	199
photoelectric	589	wall	51	Sieve analysis, aggregate	314
security	589	wall, exterior	391	Sieve, filter sock	126, 631
vibration	589	wall, interior	391	Sight screen	615
Septic		wallboard	168, 293	Sign lighting	586
sewer systems	265	Sheds, storage, rental	331	Sign numbers	172
tanks	529	Sheepsfoot roller	138	Signage, freestanding	485
Service doors	416	rental	139, 321	Signal cable	592

Signal crossing.....	486	Slab-on-grade, concrete.....	94, 352	Softball, backstops.....	618	Spheres, painting.....	437
Signs		Slabs		Softener, plumbing fixtures.....	250	Spikes.....	231
architectural signage.....	441	base.....	94	Software, project scheduling ..	311	Spiral	
Braille.....	478	capillary fill.....	339	Softwood		stairs, steel.....	385
directory.....	441	cast-in-place.....	369	flooring.....	156	Spiral staircases.....	282
display.....	441	concrete.....	84, 352	plywood.....	202	Spirals, reinforcing.....	349
elevator plates.....	479	demolition.....	336	Soil		Splash plate.....	255
handicapped.....	478	edge forms.....	89	amendments.....	622	Splices, piles.....	608
job-type.....	318	finishes.....	95	cement treatment.....	603	Splicing bars.....	348
reflector.....	617	floor.....	352	compaction.....	597, 599	Split-face block.....	215, 379
road closed.....	22	form, concrete.....	88	covers.....	603	Split-rail fence.....	148
safety.....	318	forms.....	340	hauling.....	600	Split-rib block.....	379
street numbers.....	172	forms, elevated.....	345	loading.....	600	Split-ring connectors.....	163
temporary.....	310	grading.....	339	moving by hand.....	602	Splitting rock.....	596
traffic.....	617	membrane.....	94, 339	poisoning.....	280	Split-wired outlets.....	129
Silestone countertop.....	96	rebar.....	90	sealant.....	603	Spotlight, fresnel.....	463
Silicon carbide, sidewalk grits... Silicon roofing.....	356 257	sand fill.....	339	spreading.....	597	Spray heads	
Silicone caulk.....	78, 410, 411	tennis court.....	466	stabilization.....	603	sprinkler.....	621
Silicone roof		Slag		testing.....	26, 279	Spray painting.....	238
coating.....	402	crushed.....	126	treatments.....	280	Deck.....	437
Sill		stone.....	18, 126	Soil pipe adapter.....	516	metals.....	437
anchors.....	161	Slate		Solar		steel.....	436
blocks.....	378	pavers.....	382	barricade light.....	22	Sprayed	
bolted.....	390	paving.....	614	collector system pump.....	528	fireproofing.....	409
carpentry.....	389	roofing.....	260, 261	paneling.....	280	polyurethane insulation.....	184
cover, aluminum.....	286	tile.....	287	power.....	582	urethane insulation.....	184
log.....	193	Slate roofing		protection.....	471	Sprayers, paint	
mud.....	161	demolition.....	102	screen.....	264	rental.....	328
oak.....	286	Sleepers, carpentry.....	51	shingles.....	280	Spread footings.....	377
plate gasket.....	182	Sleeves, concrete.....	355	water heating system.....	528	Spreading soil.....	597
plates.....	40, 58, 192	Slicer, bread.....	456	water storage tank.....	528	Spreading soil by hand.....	136
sealer.....	182	Slide bolt lock.....	165	Solar Tek.....	291	Springrigging.....	625
steel.....	387	Slides, playground.....	468	Solar window film.....	419	Spring bronze.....	294
window.....	296	Sliding doors		Solariums.....	481	Sprinkler fitter, wage	
Sill Seal™.....	182	aluminum.....	121	Solehold sprinkler valve.....	189	industrial & commercial.....	309
Silt fence.....	150	closers.....	105	Solid core doors		residential.....	10
Simco walk top.....	243	fire.....	415, 416	entry.....	107	Sprinkler system	
Simpson hangers.....	159	glass.....	417	hardboard interior.....	116	control.....	189
Single-family home costs.....	306	glass, insulated.....	417	Sprinklers			
Single-hung windows		patio.....	121	automatic.....	189	components.....	492, 493
aluminum.....	301	pet door.....	123	connection.....	493	connection.....	493
vinyl.....	297	screen.....	121	control wiring.....	189	control.....	189
Sinkers, nails.....	228	vinyl.....	121	fire.....	150	heads.....	492, 621
Sinks		wood.....	121	lawn.....	619	lawn.....	619
bar.....	247	Sliding windows.....	298, 302	pop-up heads.....	189	pop-up heads.....	189
bases.....	290	Slip-formed walls.....	353	subcontract.....	491	subcontract.....	491
bathroom.....	247, 533	Slop sink rough-in.....	531	trenching by hand.....	188	trenching by hand.....	188
cabinets.....	29, 290, 473	Slope protection.....	604	valves.....	189	valves.....	189
cabinets, cutout.....	31	Slopes, shaping, by hand.....	136	wall hydrants.....	493	wall hydrants.....	493
caulk.....	78	Slump block.....	216	Sprinkling,		water for excavation.....	138
demolition.....	337	Slurry seal.....	611	water for excavation.....	138	Spruce	
floor.....	535	Small tool cost.....	310	lap siding.....	201		
food service.....	457	Smart Panel siding.....	275	logs.....	192		
kitchen.....	248, 457, 531, 534	Smoke detectors.....	128, 264	pine fir.....	195		
laundry.....	248	Smoke vents.....	407	siding.....	201		
marble.....	208	Snakes (sewer), rental.....	328	Square foot costs,			
mop.....	457, 534	Shap ties.....	86, 355	homes.....	306–307		
scullery.....	457	Snow block.....	193	Square molding.....	225		
service.....	248, 534	Snow-melting cable.....	476, 561	Stack, exhaust.....	581		
wash.....	531, 535	Soap dishes.....	24	Stadium seating.....	474		
Siphon breaker, irrigation.....	189	ceramic.....	288	Stage			
Site work		commercial.....	445	HVAC.....	464		
clearing.....	594	Soap dispensers.....	445	lighting.....	463		
grading.....	596	demolition.....	337	sound system.....	463		
utilities, accessories.....	638	Soccer goals.....	465	Stage curtains.....	462		
water meters.....	312	Social Security payroll taxes.....	285	drawing equipment.....	463		
Sizing.....	293	Sod.....	187, 624, 625	lift equipment.....	463		
Skid steer loaders, rental.....	323	Sod cutters, rental.....	327	Stain			
Skid strips, stair.....	283	Sodium lamp, high-pressure.....	586	concrete.....	235		
Skip sheathing.....	395	Soffit		deck.....	98		
Skiploader, rental.....	323	demolition.....	102	paint.....	237		
Skirtboard, carpentry.....	56	forms.....	346	tinting.....	237		
Skylights		Hardie cement fiber.....	274	wood finish.....	236		
fixed.....	278	OSB.....	275	Stained glass.....	470		
operable.....	278	plaster.....	244	Staining			
polycarbonate.....	277	steel.....	68	floor.....	240, 241		
roof windows.....	279	systems.....	279				
trimmers.....	48, 71	vents.....	292				
Velux.....	277	vinyl.....	279				
Slab doors.....	107, 115, 116	wood.....	46	Speed limit signs.....	617		

Stairlifts	133	ornamental	388	Steps	
Stairs		painted	388	brick	.382
aluminum	282	painting	436	concrete	.95, 351, 354, 360
attic	284	panel roofing	260	flagstone	.216
baluster	56	piles	608	manhole	.636
basement	23, 281	pipe, black	494	masonry	.216
box	281	pipe, carbon	494	painting	.241
curved	281	plate cutting	334	Steps-on-grade, concrete	.95, 354
disappearing	284	railing	.253, 386	Sterilization, pipe	.629
factory-cut	281	reinforcing	.89, 346	Sterilizers, water	.529
framing, piecework rates	38	reinforcing, epoxy	.346	Stick nails	.229
handrails	56	reinforcing, foundation	.346	Stile & rail doors	.117
hardwood	281	reinforcing, masonry	.372	Stirrup steel reinforcing	.347
log	193	rod	.161	Stock room door	.418
L-shaped	283	roof deck	.384	Stolons, grass	.625
moving	490	roof framing	.74	Stone	
nosing, bamboo	158	sag rods	.383	aggregate	.18
rail	283	sandblasting	.263	aggregate base	.609
railing	281	security gratings	.388	artificial	.381
risers	.56, 283	shoring	.605	base	.94
skirtboard	56	stairs	.282	cleaning	.371
spiral	282	stairs, spiral	.385	countertop	.96
spiral, steel	385	stringers	.385	crushed	.94, .126
steel	282	structural, fabrication	.383	cut	.381
straight	281	testing	.317	masonry	.216
strips, anti-skid	283	threaded rod	.161	paving	.382
treads	.56, 283	tilt-up	.364	riprap	.604
wood	281	wall framing	.63	roofing	.260
Stakes		welded wire	.346	slag	.126
form	205	welding	.389	slate	.260
foundation	205	Steel doors		stepping	.187, 625
steel	.86	entry	.112	vanity tops	.97
survey	205	exterior	.110, 111	veneer	.381
Stalls, shower	246, 272	fire-rated	.109	veneer, manufactured	.381
Stamped concrete	96	garage	.164	work	.381
Standard brick	209	patio	.121	Stone tracking pad	.604
Standpipe connection	493	prehung	.414	Stool	
Stands, water heater	526	screen	.113	carpentry	.226
Staplers, rental	327	Steel doors, fire-rated	.109	marble	.381
Staples, roofing	231	Steel framing		window	.53
Starter strip		anchors	.59	Stop signs	.617
aluminum siding	276	backing for drywall	.70	Stops	
galvanized flashing	268	beams	.61	door	.171, 225, 420
shingles	.258	blocking	.62	gas	.522
thermoplastic siding	277	bracing	.67	gravel	.403
vinyl siding	276	ceilings	.68	molding	.108, 225
Starter switches	567	collar beams	.72	Storage	
Starters, motor	567	door opening	.66	bins	.310
State cost adjustments	12–15	dormer studs	.71	cabinets	.473
Steam		fascia, piecework	.76	ice	.457
baseboard radiation	538	floor joists	.59	overhead	.310
bath generator wiring	128	girders	.61	safes	.262, 263
bath, generators	285	joists, ceiling	.68	sheds	.310
cleaning	.436	joists, piecework	.73	sheds, rental	.331
cleaning, masonry	371	lally columns	.58	shelving	.448
condensate pipe	494	layout, piecework	.73	Storefront windows	.419
generators	285	piecework	.73	Store-in-Door	.114
heating	538	purlins	.72	Storm doors	.114, 115
Steam meter	524	rafters	.70	full-view	.114
Steamers, food service	454	rafters, piecework	.74	security	.115
Steamers, wallpaper, rental	328	ridgeboard	.72	self-storing	.114
Steel		rule of thumb	.56, 57	Storm drain demolition	.333
blocking	62	sheathing, piecework	.74, 76	Storm sewer	
buildings	483	sill plates	.59	cleaning	.631
conduit, flexible	552	square foot costs	.57	Storm water control	.604
conduit, rigid	543	studs	.63	Storm window	.304
cutting and drilling	388	subflooring	.62	Storm, plywood cover	.274
doors	106	trimmers	.71	StormGuard	.27
exterior walls	.64	trusses	.72, 73	Stoves, ovens, ranges	
floor joists	.59	trusses, piecework	.74	electrical work	.129
flooring	434	wall plates	.68	residential	.255
framing	.56	walls, piecework	.73	Strainers	
framing, rule of thumb	.57	window opening	.66	bronze	.539
interior walls	.63	Steel road plate, rental	.325	hydronic	.173, 539
landings	385	Steeple	.485	wye-pattern	.539
lath	188	Stem wall	.93	Strand board	.203
lintels	387	forms	.340	Straps	
masonry	215	Stenographer	.310	channel	.555
mesh	.91, 349	Step flashing	.267, 268	conduit hanger	.555
mesh reinforcing	349	Step lights	.585	connectors	.566
mini-mat reinforcing	349	Stepping stones	.187, 625	CPVC snap-on tubing	.508
				hardware	.163
				pipe	.518
				post anchor	.219
				tie	.163
				Straw bales	.187, 604
				Straw wattle	.603
				Strawberry, ground cover	.625
				Street	
				illumination	.486
				lighting	.486
				lights	.587
				marking	.616
				numbers, houses	.172
				paving	.610
				paving, equipment rental	.325
				sweeper	.612
				sweeper, rental	.325
				Strip	
				doors	.418
				flooring	.55, 157
				lighting	.582
				shingle starter	.258
				Striper, rental	.325
				Striping	
				athletic courts	.467
				pavement	.616
				Striplights	.582
				Stripping	
				forms	.89
				soil, by hand	.136
				Structural engineering	.134
				glazed tile	.374
				steel	.383
				Structural plywood	.203
				Structural steel	
				fabrication	.383, 388
				painting	.436
				Structure moving	.338
				Structures, temporary, rental	.330
				Stucco	
				demolition	.102, 337
				mesh	.425
				mix	.82
				mold	.108
				netting	.188
				paint	.235
				painting	.238, 241, 437
				plastering	.244, 427
				wall assembly	.35, 58
				Stud grade lumber	.194
				Studios, radio and television	.488
				Studs	
				carpentry	.389
				demolition	.104
				dormer	.48
				exterior walls	.35, 58
				gable	.37
				interior walls	.34, 57
				rule of thumb, steel framing	.57
				steel	.63, 73
				steel exterior	.64
				straightening	.52
				straps	.163
				wall assemblies	.34, 57
				wall framing	.37
				walls, commercial	.389
				Study carrels	.459
				Stump grinders, rental	.327
				Stump removal	.138, 594
				Sturdi-Floor	.203
				Subbase, pavement	.609
				Subcontract	
				driveway paving	.243
				electrical work	.127
				elevators	.133
				fire sprinkler systems	.491
				hydroseeding	.187, 624
				insulation	.183
				painting	.239
				sprinkler systems	.491
				stamped concrete	.369

store front windows.....	419	Switch cover plate.....	565	Technical services.....	317	water .....	26																																																																																																																																																																																		
surface preparation.....	239	Switchboards .....	570	Techwall wall cladding .....	400	Tetherball post .....	468																																																																																																																																																																																		
tile shower.....	246	accessories.....	571	Tectum .....	403	Textolite countertops.....	96																																																																																																																																																																																		
well drilling.....	295	instrumentation .....	571	Tees		Texture																																																																																																																																																																																			
Subcontract costs defined.....	5	meters .....	571	ABS cleanout .....	515	popcorn ceiling .....	169																																																																																																																																																																																		
Subcontractor markup .....	5	transformers.....	571	ABS sanitary .....	514	Texture 1-11 .....	203																																																																																																																																																																																		
Subflooring		weatherproof.....	570	black steel .....	494	Texture, drywall .....	169																																																																																																																																																																																		
2-4-1.....	203	Switches		copper .....	504	Textured wallboard .....	424																																																																																																																																																																																		
adhesive.....	18	dimmer .....	564	copper DWV .....	512	Theater																																																																																																																																																																																			
board.....	62	dimmer, fluorescent .....	564	CPVC .....	507	curtains .....	462																																																																																																																																																																																		
engineered.....	42	disconnect .....	577	PVC .....	506	seating .....	474																																																																																																																																																																																		
floating .....	42	electric .....	129	test .....	515	Thermal																																																																																																																																																																																			
installation .....	42, 62	electrical .....	564	Wisconsin .....	514	analysis .....	184																																																																																																																																																																																		
log homes .....	192	exhaust fan .....	141	Telephone .....		expansion tank .....	249																																																																																																																																																																																		
OSB .....	42, 63	fan control .....	141	outlets .....	591	insulation .....	397																																																																																																																																																																																		
piecework rates .....	42	motor .....	567	wiring .....	591	mitigation .....	471																																																																																																																																																																																		
plywood .....	42, 62	power distribution .....	570	Telephone assistance .....	5	Thermal and Moisture																																																																																																																																																																																			
Sturdi-Floor .....	203	safety.....	568, 569	Telescoping doors .....	417	Protection .....	397																																																																																																																																																																																		
underlayment .....	203	security.....	589	Television .....		Thermoflow indicator .....	524																																																																																																																																																																																		
Sub-panel connections .....	129	starter .....	568	closed circuit .....	592	Thermography .....	184																																																																																																																																																																																		
Subsurface exploration .....	279	timer, exhaust fan .....	141	educational .....	458	Thermometer, steam .....	524																																																																																																																																																																																		
Subway platform .....	487	wiring .....	129	equipment .....	458	Thermoplastic .....																																																																																																																																																																																			
Sump pumps .....	129, 528	Swivel ring hangers, pipe .....	517	outlets .....	592	siding .....	277																																																																																																																																																																																		
Sumps, roof .....	406	Symbols .....		pipe inspection .....	637	tape .....	467																																																																																																																																																																																		
Sun control blinds .....	296	lettering .....	467	studio .....	488	Thermostat .....	176																																																																																																																																																																																		
Sun porch .....	167	Synthetic surface .....		systems .....	592	Thermostatic .....																																																																																																																																																																																			
Sun screens .....	388	playing fields .....	465	wiring .....	129	mixing valves .....	540																																																																																																																																																																																		
Sunlamps, wiring .....	128	Teller .....		traps .....	540	traps .....	527																																																																																																																																																																																		
Sunrooms .....	481	automatic .....	452	water heaters .....		THHN wire .....	558																																																																																																																																																																																		
Super Jumbo Tex .....	27	counter .....	452	Thinners .....	238																																																																																																																																																																																				
Super Tuff-R .....	398	window .....	453	Thompson's WaterSeal .....	236																																																																																																																																																																																				
Superintendent .....	310, 314	Temperature gauge .....		Threaded																																																																																																																																																																																					
Supervision costs .....	314	Tempering valves .....	540	black steel pipe .....	494																																																																																																																																																																																				
Supervision costs excluded .....	4	Temporary enclosures .....		carbon steel pipe .....	494																																																																																																																																																																																				
Supply valve .....	522	enclosures .....	331	Threaded rod .....	161																																																																																																																																																																																				
Supports .....		fence .....	331	Thresholds																																																																																																																																																																																					
conduit .....	554	jackposts .....	186	aluminum .....	285																																																																																																																																																																																				
fabricated metal .....	387	services .....	310	bamboo .....	158																																																																																																																																																																																				
PVC .....	551	structures .....	480	bronze .....	421																																																																																																																																																																																				
Surface duct, electric .....	556	structures, rental .....	330	high boy .....	108																																																																																																																																																																																				
Surface preparation .....		utilities .....	318	inserts .....	286																																																																																																																																																																																				
....233, 234, 239, 435, 437, 439		wall bracing .....	44, 67	marble .....	381																																																																																																																																																																																				
Surgeons' scrub sink .....	535	Tack coat, pavement .....	611	wood .....	222																																																																																																																																																																																				
rough-in.....	531	Tampers, rental .....	320	Thrust blocks, concrete .....	627																																																																																																																																																																																				
Surveillance .....		Tamping, excavation .....	339, 597, 599	Thru-the-wall utility fan .....	140																																																																																																																																																																																				
camera .....	453	Tamping, excavation .....		THWN wire .....	558																																																																																																																																																																																				
park .....	486	by hand .....	136	Ticket boxes .....	452																																																																																																																																																																																				
Survey .....		Tankless water heater .....	249, 526	Ticket dispenser .....	450																																																																																																																																																																																				
building layout .....	595	Tanks .....		Tie straps .....	163																																																																																																																																																																																				
Survey stakes .....	205	demolition .....	333	Tie wire .....	219																																																																																																																																																																																				
Surveying .....	313	expansion .....	249	Tier IV EPA pollution																																																																																																																																																																																					
aerial .....	313	foundations .....	366	control rating .....	581	periodic .....	318	fuel .....	540	Ties		Sushi serving table .....	454	oil .....	540	brick wall .....	219	Suspended ceiling .....	79, 429	painting .....	437	collar .....	48	demolition .....	100, 336	propane .....	541	concrete .....	355	grid systems .....	79, 429	septic .....	265, 529	concrete form .....	86, 355	light fixtures .....	80	water .....	529, 630	form .....	86, 339	panels .....	80, 81, 430	Tape .....		hurricane .....	161	T-bar grid .....	429	caution barricade .....	23	seismic .....	161	tile .....	430	plumber's .....	518	wall, brick .....	159	Suspension grid, ceiling .....	79	thermoplastic .....	467	wall, masonry .....	210, 372	Sweep pavement .....	612	Taping wallboard .....	168, 423	Tile .....		Sweep, door bottom .....	287	Tapping .....		acoustical facing .....	374	Sweeper, rental .....	325	pipe .....	627	backer board .....	290	Swimming pool .....		saddles .....	627	ceiling .....	82, 430	complete installation .....	475	valves .....	627	ceramic .....	374, 427	cover .....	476	Tar, roofing .....	257	clay .....	374	fences .....	150	Tarkett flooring .....	153	concrete roof .....	261	gunite .....	357	Tarp, painting .....	439	decorative .....	288	heaters, solar .....	250	Tarpaulins .....	285	demolition .....	101, 102, 336	paint .....	237, 438	T-astragal .....	108	epoxy bed .....	382	resurfacing .....	369	Taxable fringe benefits .....		floor .....	287	Swing check valves .....	521	industrial & commercial .....	309	glazed .....	374	Swing gates, aluminum .....	165	residential .....	10	installation .....	288, 289	Swinging stage scaffold, purchase .....	330	Taxes and insurance .....	285, 310	marble .....	208	Swings, playground .....	468	Taxes included .....	4	masonry .....	220	Switch box, electric .....	562	Taxes, labor cost .....		porcelain .....	287	circuits .....	575	industrial & commercial .....	309	quarry .....	381, 429	plates .....	23	residential .....	10					Tear-off roofing, demolition .....	401					Tech support .....	5		
control rating .....	581																																																																																																																																																																																								
periodic .....	318	fuel .....	540	Ties		Sushi serving table .....	454	oil .....	540	brick wall .....	219	Suspended ceiling .....	79, 429	painting .....	437	collar .....	48	demolition .....	100, 336	propane .....	541	concrete .....	355	grid systems .....	79, 429	septic .....	265, 529	concrete form .....	86, 355	light fixtures .....	80	water .....	529, 630	form .....	86, 339	panels .....	80, 81, 430	Tape .....		hurricane .....	161	T-bar grid .....	429	caution barricade .....	23	seismic .....	161	tile .....	430	plumber's .....	518	wall, brick .....	159	Suspension grid, ceiling .....	79	thermoplastic .....	467	wall, masonry .....	210, 372	Sweep pavement .....	612	Taping wallboard .....	168, 423	Tile .....		Sweep, door bottom .....	287	Tapping .....		acoustical facing .....	374	Sweeper, rental .....	325	pipe .....	627	backer board .....	290	Swimming pool .....		saddles .....	627	ceiling .....	82, 430	complete installation .....	475	valves .....	627	ceramic .....	374, 427	cover .....	476	Tar, roofing .....	257	clay .....	374	fences .....	150	Tarkett flooring .....	153	concrete roof .....	261	gunite .....	357	Tarp, painting .....	439	decorative .....	288	heaters, solar .....	250	Tarpaulins .....	285	demolition .....	101, 102, 336	paint .....	237, 438	T-astragal .....	108	epoxy bed .....	382	resurfacing .....	369	Taxable fringe benefits .....		floor .....	287	Swing check valves .....	521	industrial & commercial .....	309	glazed .....	374	Swing gates, aluminum .....	165	residential .....	10	installation .....	288, 289	Swinging stage scaffold, purchase .....	330	Taxes and insurance .....	285, 310	marble .....	208	Swings, playground .....	468	Taxes included .....	4	masonry .....	220	Switch box, electric .....	562	Taxes, labor cost .....		porcelain .....	287	circuits .....	575	industrial & commercial .....	309	quarry .....	381, 429	plates .....	23	residential .....	10					Tear-off roofing, demolition .....	401					Tech support .....	5								
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Sushi serving table .....	454	oil .....	540	brick wall .....	219																																																																																																																																																																																				
Suspended ceiling .....	79, 429	painting .....	437	collar .....	48																																																																																																																																																																																				
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		Tech support .....	5																																																																																																																																																																																						

resilient.....	432	dispensers.....	445	inlets.....	637	enclosures.....	272
roller, rental.....	326	racks.....	24	shaping.....	597, 602	plumbing.....	245, 531, 533
roofing.....	261	Towers		sheeting.....	605	Tuck pointing.....	371
rubber.....	432	fire pole, playground.....	469	shields, rental.....	323	Tuff-R insulation.....	182
rubber studded.....	154	lifting.....	319	shoring.....	605	Tung oil wood finish.....	236
saws, rental.....	328	Toxic chemicals, removal.....	435	sprinkler pipe.....	619	Turbines.....	579
security, glazed.....	374	Track		Trench plate, steel.....	325	additional costs.....	580
shock-absorbing.....	432	railroad, demolition.....	334	Trenchers, rental.....	139, 323	fans.....	407
simulated roofing.....	260	rolling ladder.....	459	Trenching.....	597	service station.....	449
structural facing.....	374	stage curtain.....	462	backhoe.....	597	vents.....	292
vinyl floor.....	153, 154	Tracking pad, stone.....	604	concrete.....	338	vents, roof.....	141
wall.....	287	Tractor		excavation.....	136, 597	Turf	
Tile layer, wage		demolition.....	335	hand.....	136, 602	artificial grass.....	465
industrial & commercial.....	309	excavation.....	596, 601	hand work.....	339	playing fields,	
residential.....	10	finish shaping.....	597	grass and synthetic.....	465	replacing.....	619, 624
Tile shower.....	246	ripping rock.....	596	Turfstone		615	
Tillers, rental.....	327	rock fill.....	604	Turnstone		615	
Tilt double-hung window.....	303	site clearing.....	594	Turnstiles		452, 487	
Tilt-up concrete.....	360	site grading.....	596	Turpentine		238	
Tilt-up construction.....	362	Traffic		Twiaxial cable.....	593		
panels, sandblasting.....	263	cones.....	22	Twist straps.....	164		
pilasters.....	362	control equipment rental.....	326	Type K copper pipe.....	503		
Tilt-up painting.....	437	control signage.....	318	Type L copper pipe.....	503		
Timbers		light.....	486	Tyvek		28, 183	
Douglas fir.....	201	paint.....	237				
hardwood.....	396	pavement marking.....	616				
laminated.....	396	signs.....	617				
lumber.....	197, 201	stripes.....	616				
pine.....	202	symbols.....	616				
rafter.....	193	Transaction					
red cedar.....	201	window.....	453				
redwood.....	201	Transformers					
treatments.....	206	indoor.....	572				
wood.....	396	pole mount.....	572				
Timekeeper costs.....	314	potential, switchboard.....	571				
Timer switches.....	141, 564	switchboard.....	571				
15 minute.....	564	Transit levels, rental.....	327				
Tin		Transit mix concrete.....	84				
ceilings.....	82	Transom lite.....	414				
shingles.....	268	Trap adapter					
Tint		ABS.....	516				
paint.....	237	copper.....	512				
wood finish.....	236	Traps					
Tint, window.....	419	float.....	540				
Tire changer.....	450	thermostatic.....	540				
Tissue holder.....	24, 445	Trash					
TJI truss joists.....	41, 395	bins.....	332				
Toaster, conveyor type.....	456	chutes.....	337, 491				
Toggle switch.....	565, 568	enclosure, tilt-up.....	366				
Toilets.....	247, 532	removal.....	310				
accessories.....	24, 445	Trash compactor wiring.....	130				
augers, rental.....	328	Trash pumps, rental.....	324				
compartments.....	442	Travertine tile.....	287				
flush valves.....	532	Treads.....					
jobsite.....	310	carpentry.....	56				
partition, handicapped.....	478	concrete, finishing.....	356				
partitions, demolition.....	337	flagstone.....	216				
rough-in.....	530	marble.....	381				
temporary.....	310, 319	rubber.....	220				
trailer-mounted.....	319	stair.....	283				
Tongue and groove		wood.....	281, 396				
flooring.....	155	Treated lumber.....	201				
insulation board.....	181	Treating					
sheathing.....	51	lumber.....	207				
siding.....	199	poles.....	204				
Tool sheds, rental.....	331	soil.....	280				
Tools available.....	4	wood.....	207				
Tools, rental.....	320	Treatment					
Toothbrush holders		fire retardant.....	207				
ceramic tile.....	288	soil poisoning.....	280				
residential.....	23	Tree clearing.....	138, 594				
Topping, concrete.....	95, 356	Trees					
Topsoil		costs.....	625				
excavation, by hand.....	136	planting.....	624				
placement.....	187	Trench					
strip.....	595	braces, rental.....	323				
Torch cutting.....	334	covers.....	385				
Total column defined.....	5	frame.....	637				
Total expense, overhead.....	310	Tubs					
Towel		access doors.....	266				
bars.....	445	caulk strips.....	79				
		caulking.....	78				

**U**

U bolts.....	518
Ultra Touch.....	183
Ultrasonic sensors and transceivers.....	590
Ultraviolet sterilizers, water.....	529
Underfloor duct.....	557
Underground	
communication.....	541
duct.....	541
power.....	541
Underayment.....	203, 262, 432
floor.....	34
particleboard.....	395
piecework rates.....	38, 74
roof.....	27
tile backer board.....	290
Underpinning, shoring.....	605
Unions	
black steel.....	494
CPVC.....	507
Unistrut inserts.....	355
Unit heaters.....	535, 538
Uniturf.....	465
Unusual labor productivity.....	4
URD wire.....	558
Urethane	
exterior finish.....	236
floor finish.....	56
insulation.....	184
sealer.....	155
sheathing.....	182
Urinal	
floor-mounted.....	531
rough-in.....	530, 531, 532
screens.....	442
screens, removal.....	337
wall-hung.....	530
water-conserving.....	532
Urns.....	473
USE wire.....	558
Using this book.....	3
Utilities	
overhead.....	310
sewer connections.....	266
sitework piping.....	628
temporary.....	318
water.....	312
Utility	
cabinets.....	30
fan.....	139, 140
piping, sitework.....	628
shelving, wood.....	270
sinks, food service.....	457

**V**

Vacation costs included.....	3
Vac-jet pipe cleaning .....	631
Vac-jetter cleaning.....	631
Vacuum breaker	
anti-siphon .....	173
atmospheric.....	538
controllers .....	618
valves .....	618
Vacuum systems.....	290
wiring.....	130
Vacuum, wet/dry, rental .....	326
Valance	
cabinet .....	31
lighting.....	190
Valley flashing .....	403
Valuation fees.....	18
Valuation, buildings .....	18
ValueTest bath fan .....	140
Valve box.....	221, 619
Valves	
angle .....	522
backflow.....	312, 522
ball.....	522
cast iron .....	627
check.....	519, 521
circuit balancing.....	539
control .....	618
flow check .....	173, 539
gate .....	519, 627
globe .....	520
hose gate .....	523
irrigation .....	618, 622
mixing.....	173, 540
OD tube .....	522
pressure-reducing.....	539
regulator.....	523
relief.....	522, 539
sprinkler.....	189, 620
sprinkler, lawn .....	620
stop .....	522
supply .....	522
tapping.....	627
tempering.....	540
thermostatic mixing.....	173
water control .....	523
Vanity	
bases .....	290
mirrors .....	221
Vanity tops	
Corian.....	97
cultured stone .....	97
marble .....	97
Vapor barriers	
building paper.....	27
concrete .....	430
polyethylene film .....	253
slab .....	94, 339, 352, 353, 362
Vapor tight lights, LED .....	585
Varathane finish.....	236
Varmeter.....	571
Varnish wood finish .....	236
Varnishing.....	241
Vault	
door .....	452
Vault doors .....	418
VCR .....	458
Vehicle	
access control .....	450
detectors .....	450
Velour	
draperies .....	471
stage curtains .....	462
Velux	
roof windows.....	279
skylights .....	277
Veneer	
brick .....	211
masonry .....	216

**W**

Venetian blinds.....	296
Vent	
channel, rafter bay .....	292
fans .....	142, 407, 455
hoods .....	253, 455
Vent pipe .....	512
copper .....	512
flash cone .....	268, 269, 270
Vented range hood .....	253
Ventilating skylights.....	278
Ventile doors	
fiberglass exterior.....	113
Vents	
attic .....	291, 406
bath .....	141
clothes dryer .....	291
foundation .....	291, 406
hood .....	260
intake, roof .....	292
louver .....	292
plumbing .....	404
power .....	142
ridge .....	292
roof .....	141, 142, 292
roof turbine .....	141
screen .....	291
soffit.....	292
turbine .....	292
Vermiculite	
insulation .....	183, 398
roof deck .....	369
soil conditioner .....	623
Vertical blinds .....	296
Vertical discharge exhaust fan .....	139
Vertical panels, precast tilt-up .....	364
Vibration sensors .....	589
Vibrator compaction .....	597
Vibrators, rental .....	321
Vibro plate, rental .....	139
Vibroflotation treatment .....	603
Video recorder, digital .....	592
Videotape recorder .....	458
Vinyl	
acrylic .....	237
casement window .....	299
caulk .....	78
covered wallboard .....	293
fence .....	149
flashing .....	270
flooring .....	153, 154, 431
flooring, sheet .....	431
molding .....	226
runner .....	220
screen doors .....	113
siding .....	276, 401
soffit systems .....	279
tile flooring .....	153
wallcovering .....	434, 435
Vinyl plank flooring .....	154, 432
Vinyl windows	
bay .....	299
casement .....	299
double-hung .....	297, 298
garden .....	299
half circle .....	299
hopper .....	300
jalousie .....	299
picture .....	299
single-hung .....	297
sliding .....	298
Vinyl-clad wood windows .....	300, 301
Visqueen polyethylene film .....	253
Vitrified clay pipe .....	266
Volatile materials emissions reduction, pollution control .....	579, 581
Volcanic cinder track .....	465
Volcanic rock .....	604
Volleyball posts .....	465
Voltmeter .....	571
Vycor flashing .....	27
Waffle pan forms .....	345
Wage costs defined .....	3
Wage rates .....	10
adjusting .....	11
industrial & commercial .....	309
residential .....	10
Wagon drills .....	595
rental .....	324
Wainscot .....	54
cap .....	225
ceramic tile .....	433
tile .....	287, 289
Wainscott paneling .....	242
Waler	
brackets .....	356
jacks .....	356
Walk-in coolers .....	457
Walkways	
asphalt .....	243, 615
concrete .....	94, 244, 615
demolition .....	100, 332
edge forms .....	88
forms .....	94
lighting .....	191
snow-melting cable .....	561
waterproofing .....	294
Wall	
access doors .....	266
anchors, glass block .....	381
anchors, masonry .....	372
assemblies, brick .....	209
assemblies, concrete block .....	213
assemblies, exterior .....	35, 58
assemblies, interior .....	34, 57
beds .....	25
braces .....	44, 67, 164
cladding .....	400
cleaning .....	83
courses .....	192
cover plate .....	565
coverings .....	293
demolition .....	100, 103, 335
filler panels .....	31
fireblocks .....	45
footing .....	339
forms, concrete .....	88, 92, 341
framing .....	37
framing, piecework .....	37
framing, steel .....	63, 64, 73
jointing .....	357
painting .....	238, 437
panel systems .....	394
piecework rates, framing .....	73
plates .....	42, 68
protection systems .....	444
reinforcing .....	372
safes .....	262
sawing, concrete .....	370
sheathing, board .....	51
sheathing, exterior .....	391
sheathing, interior .....	391
sheathing, lumber .....	392
sheathing, OSB .....	51
sheathing, piecework .....	37, 73
sheathing, plywood .....	51
stiffener .....	193
studding .....	389
ties, masonry .....	159, 210, 219, 372
Wall jacks, computers .....	594
Wall pack light fixture .....	585
Wallboard	
adhesive .....	18
demolition .....	102, 335
gypsum .....	168
hardboard .....	242, 435
paint preparation .....	239
painting .....	238, 241
prefinished .....	293
textured .....	293, 424
Wallcap .....	288
Wallpaper .....	293, 434
adhesive .....	293
removal .....	293
surface preparation .....	293
Walls	
brick .....	209
concrete .....	86, 87, 92
concrete block .....	213, 378
glass block .....	217, 380
masonry .....	209
paint removal .....	233
panelized wood .....	394
patching .....	293
precast panels .....	357
retaining .....	375
sheet metal, area .....	267
tile .....	289
tilt-up .....	362
Walnut	
parquet .....	158
plank flooring .....	155
Wardrobe cabinets .....	458, 472, 473
Warning signs .....	442, 617
Wash	
concrete finishing .....	356
masonry .....	371
painting .....	439
surface prep .....	439
Wash fountains .....	534
rough-in .....	531
Wash sinks, surgeons .....	531, 535
Wash stations .....	534
Washer, clothes	
rough-in .....	252
wiring .....	128
Washers	
galvanized .....	232
stainless steel .....	232
Waste	
disposal .....	332
handling equipment .....	491
receptacle .....	445
Waste defined .....	3
Waste pipe	
ABS .....	512
copper .....	512
fittings .....	512
Water	
blast before painting .....	437
blasting .....	239, 263, 371, 436
capacity fee .....	312
control valves .....	523
coolers .....	534
coolers, for handicapped .....	477
coolers, rough-in .....	531
distillation .....	250
filters .....	529
fountains .....	534
heaters .....	248, 526
heating .....	248, 249
heating, solar .....	528
heating, whole house .....	253
hose, service station .....	449
meter boxes .....	221
meter fee .....	312
meters .....	312
overhead .....	310
pipe, PVC .....	628
pool heating, solar .....	250
pumps, wiring .....	130
service .....	312
softeners .....	250, 529
softeners, rough-in .....	252
solar heating .....	249
storage tanks, solar .....	249
tanks .....	529, 630
tanks, rental .....	325
temporary .....	319
testing .....	26
treatment .....	529
trucks, rental .....	325
wells .....	295

Water closets	Weld-o-lets	499	reglazing	239	Wisconsin tee	514
commercial	Welfare costs included	3	removal	337	Wolmanized lumber	207
demolition	Well drilling, subcontract	295	roof	279, 304	Wonderboard tile backer	290
installation	Wellpoint dewatering	602	screen	300	Wood	
residential	Wenge cabinets	472	seals	294	fences	148
rough-in	West coast fir lumber	194, 196	security grill	485	filler	238
Water heater	Western red cedar siding	199	shades	296	finishes	236
accessories	Wet paint barricade	23	sills	296	floor finishing	56, 430
leak detection	Wet patch roof cement	256, 257	skylights	277	flooring	55, 155, 430
tankless	Wet sandblasting	263	steel	419	flooring adhesive	159
Water heaters	Wheel corner guards	387	stool, marble	381	lumber	207
assemblies	Wheel loader		stool, MDF	226	paint preparation	239
commercial	rental	138	stool, wood	226	piles	606
connections	Wheel loaders	598	storm	304	preservative	207, 237
earthquake restraints	rental	139	teller	452	roofing	259
electric	Wheelbarrow		treatment	296	sealer	236
gas	hauling debris	337	trim	53, 226	shingles	259
instantaneous	hauling soil	602	vinyl	297, 298, 299, 300	stain	236
overflow pans	Wheelbarrows, rental	327	vinyl bay	299	treatment, lumber	207
propane	Wheelchair		vinyl casement	299	waterproofing	236
residential	lifts	133	vinyl double-hung	297, 298	Wood and composites	389
safety pans	ramp	476	vinyl garden	299	Wood chip mulch	187
solar	swing platform	468	vinyl hopper	300	Wood doors	
stands	Whirlpool bathtubs	245	vinyl jalousie	299	patio	121
wiring	wiring	128	vinyl picture	299	screen	113
Water meter	White cement	82, 427, 433	vinyl single-hung	297	Woodcore storm doors	115
Water table	White roof coating	257	vinyl sliding	298	Woodwork	
flashing	Whiteboard (chalkboard)	440	vinyl-clad awning	300	paint preparation	239
molding	Whitewash stain	237	vinyl-clad basement	301	painting	241
Water-based stain	Whole house fans	141	vinyl-clad casement	300, 301	staining	241
Waterblasting	Wilsonart countertops	96	vinyl-clad wood	300, 301	waxing	241
Watering	Wind clips	262	wall	422	Woodworking glue	18
embankment grading	Wind turbines	132	weatherstripping	294	Work tables	
landscaping	Windbreak, tennis	466	wood	419	food service	454
sprinkler systems	Window		Wingwall	638	kitchen	454
trenching	plywood cover	274	Wiping stain	237	Workers' comp insurance	185
Waterproof adhesive	removal	103	Wire		Working conditions	4
Waterproofing	teller	453	building	127	Woven wire partitions	444
acrylic	transaction	453	copper	558	Wrecking, demolition	104
asphalt	Window air conditioners	177	electric	127	Wrenches, rental	328
building	Window wells	305	ground	558	Wrought iron	150
concrete	Window, safety film	419	lath	188	railing	386
insulation	Window, tint film	419	partitions	444	W-valley flashing	267, 268
masonry	Windows		Romex	559	Wye pattern strainers	173, 539
membrane	aluminum single-hung	301	screen	264	Wyes	
multi-surface	aluminum sliding	302	service entrance	129, 557	ABS	514
paper	apron	53	shelving	270	drain pipe	126
slab	architectural	419	sprinkler	620	<b>X</b>	
walkways	awning	21, 300	THHN, copper	558	Xerographic prints	25
wood finish	awning, aluminum	302	URD	558	XHHW wire	559
WaterSeal wood sealer	bank	452	USE	558	X-ray	
Waterstop, concrete	basement	301	XHHW, copper	559	barriers	484
Wattmeter	bay	299	Wire brush		lead mesh fabric	471
Waxing	blinds	272	finish	95	mobile barriers	484
concrete	bow, wood	304	painting	439	protection	484
floors	casement	299, 300, 301	Wire glass	418	viewing panels	484
woodwork	casing	54	Wire mesh	91	<b>Y</b>	
Weather vanes	caulking	78	fence	143	Yard	
Weatherproof	circular, vinyl	299	gunite	357	deck	100
service entrance	cleaning	83, 331	reinforcing	91	lighting	587
switchboards	coverings	273	Wireless access points	130	Yardarm, nautical	449
wood finish	double-hung	303	Wiremold raceway	556	Yellow pine lumber	195
Weatherproofing	fixed	299	Wireway, electrical	556	Yield signs	617
wood finish	frames, paint removal	233	Wiring		<b>Z</b>	
Weatherstripping	framing	44	alarms	264	Z-bar flashing	267, 268
Wedge tie, concrete form	framing, steel	66	campus network	459	Z-brick	243
Wedges	garden	299	computer	130, 459	Zinc primers	234
Weed eaters, rental	glass	166	control wiring	189	Zone	
Welded	grating	388	controllers	189	heating and cooling	178
black steel pipe	impact	301	doorbell	105	Zone valves	492
carbon steel pipe	jalousie	299	educational network	459		
mesh	mantels	295	electric	127		
wire mesh	octagonal	303	fence, electric	144		
Welding	paint preparation	239	irrigation controls	189		
grounding	partition	238, 239, 241	landscape sprinklers	189		
machines, rental	picture	299	phones	591		
rebar			systems	591		
steel			telephone	591		
tilt-up			twisted pair	591		

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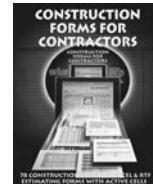


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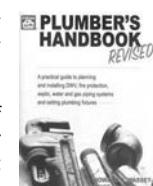


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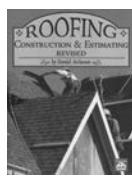


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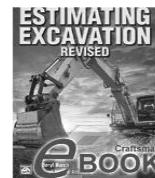
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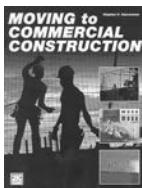
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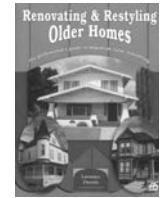
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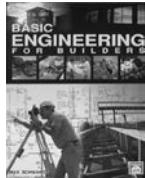
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