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2020

NATIONAL CONSTRUCTION ESTIMATOR

68th Edition

Edited by Richard Pray

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Contents

A complete index begins on page 640

How to Use This Book	3-5
Abbreviations and Symbols	6
Craft Codes and Crews	7-9
Residential Division Labor Cost	10
Adjusting Labor Costs	11
Area Modification Factors	12-15
Credits and Acknowledgments	16
Residential Division	17-305
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
Construction Economics Division	307
Industrial & Commercial Division Labor Cost	309
Industrial and Commercial Division	310-339
01 General Requirements	310-332
02 Existing Conditions	332-338
03 Concrete	338-371
Concrete formwork	339
Reinforcing steel	346
Foundations	361
04 Masonry	371-382
Reinforcing and flashing	372
Brick and block walls	373
05 Metals	383-389
Structural steel	383
Steel floor and roof decking	384
06 Wood and Composites	389-397
Framing carpentry	389
07 Thermal & Moisture Protection	397-412
Thermal insulation	398
Roof insulation	399
Membrane roofing	401
08 Openings	412-423
Metal doors	412
Hardware	420
09 Finishes	423-440
Gypsum wallboard	423
Ceilings and flooring	429
10 Specialties	440-449
Partitions	443
11 Equipment	449-470
12 Furnishings	470-475
13 Special Construction	475-488
14 Conveying Equipment	488-491
21 Fire Suppression	491-493
22 Plumbing	494-535
Pipe and fittings	494
Hangers and supports	516
Valves, pumps, gauges	519
23 HVAC	535-541
Gas fired heaters	535
Hydronic & steam heating	537
26 Electrical	541-588
Rigid steel conduit	543
EMT conduit and wire	546
PVC conduit and wire	551
Conduit supports & hangers	554
Wire and cable	557
Lighting	582
27 Communications	589-594
31 Earthwork	594-609
Excavation and backfill	597
Shoring, bulkheads, piles	605
32 Exterior Improvements	609-626
Paving and curbs	609
Fencing and gates	617
33 Utilities	626-639
Pressure water pipe	628
Drain pipe	631
Index	640

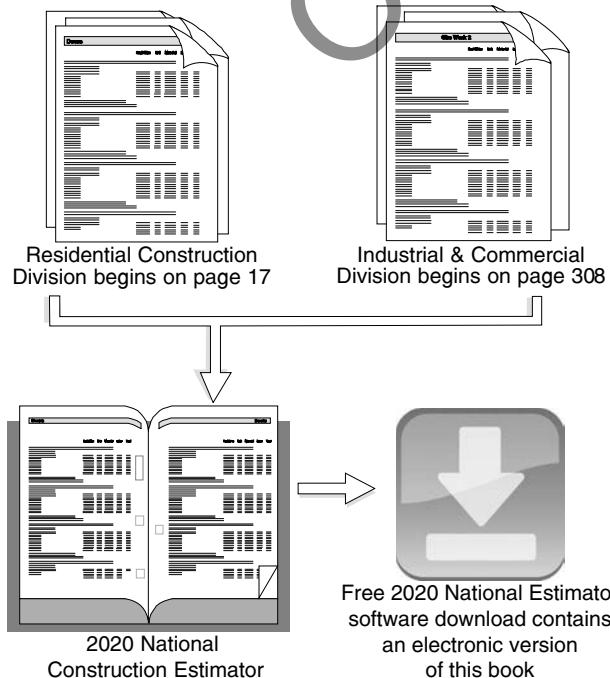
This Book Is an Encyclopedia of 2020 Building Costs

The 2020 National Construction Estimator lists estimated construction costs to general contractors performing the work with their own crews, as of mid-2020. Overhead & profit are not included.

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.

When the National Estimator program has been installed, click Help on the menu bar to see a list of topics that will get you up and running. Or go online to www.craftsman-book.com, click on "Support", then click on "Tutorials" to view an interactive video for National Estimator.



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 mid-2020. Discounts may be available for purchases in larger volume.

Quarterly prices updates on the Web are free and automatic all during 2020. You'll be prompted when it's time to collect the next update. A connection to the Web is required.

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.

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.

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.

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.

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.

Keep In Mind

Labor and Material Costs Change. Costs were compiled in the fall of 2019 and projected to mid-2020 based on recent price trends. These estimates will be accurate for some materials and inaccurate for others. No one can predict every change in material prices.

How Accurate Are These Figures? As accurate as possible considering that the estimators who wrote this book 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, had to project material costs at least 6 months into the future, and had no record of how much work the crew that will be assigned to the job 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 what the correct costs are, 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 your 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.



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

AASHTO	American Assn. of State Highway Officials	FAA	Federal Aviation Administration	OC	spacing from center to center
ABS	acrylonitrile butadiene styrene	FICA	Federal Insurance Contributions Act (Social Security, Medicare tax)	OD	outside diameter
AC	alternating current	FOB	freight on board	OS & Y	outside screw & yoke
AISC	American Institute of Steel Construction Inc.	FPM	feet per minute	oz	ounce
APP	attactic polypropylene	FRP	fiberglass reinforced plastic	perf	perforated
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers	FS	Federal Specification	Pr	pair
ASME	American Society of Mechanical Engineers	ft-lbs	foot pounds	PSF	pounds per square foot
ASTM	American Society for Testing Materials	FUTA	Federal Unemployment Compensation Act Tax	PSI	pounds per square inch
AWPA	American Wood Products Association	Gal	gallon	PV	photovoltaic
AWWA	American Water Works Association	GFCI	ground fault circuit interruptor	PVC	polyvinyl chloride
Ba	bay	GPH	gallon(s) per hour	Qt	quart
Bdle	bundle	GPM	gallon(s) per minute	R	thermal resistance
BF	board foot	H	height	R/L	random length(s)
BHP	boiler horsepower	HP	horsepower	R/W/L	random widths and lengths
Btr	better	Hr(s)	hour(s)	RPM	revolutions per minute
Btu	British thermal unit	IMC	intermediate metal conduit	RSC	rigid steel conduit
B & W	black & white	ID	Inside diameter	S1S2E	surfaced 1 side, 2 edges
C	thermal conductance	KD	kiln dried or knocked down	S2S	surfaced 2 sides
C	one hundred	KSI	kips per square inch	S4S	surfaced 4 sides
CF	cubic foot	KV	kilovolt(s)	Sa	sack
CFM	cubic feet per minute	KVA	1,000 volt amps	SBS	styrene butyl styrene
CLF	100 linear feet	kw	kilowatt(s)	SDR	size to diameter ratio
cm	centimeter	kwh	kilowatt hour	SF	square foot
CPE	chlorinated polyethylene	L	length	SFCA	square feet of form in contact with concrete
CPM	cycles per minute	Lb(s)	pound(s)	Sq	100 square feet
CPVC	chlorinated polyvinyl chloride	LF	linear foot	SSB	single strength B
CSPE	chloro sulfinated polyethylene	LP	liquified propane	STC	sound transmission class
CSF	100 square feet	LS	lump sum	Std	standard
CSY	100 square yards	M	one thousand	SY	square yard
CY	cubic yard	Mb	million bytes (characters)	T	thick
d	penny	MBF	1,000 board feet	T&G	tongue & groove edge
D	depth	MBtu	1,000 British thermal units	TV	television
DC	direct current	MCM	1,000 circular mils	UBC	Uniform Building Code
dia	diameter	MDO	medium density overlaid	UL	Underwriter's Laboratory
DSB	double strength B quality glass	MH	manhour	USDA	United States Dept. of Agriculture
DWV	drain, waste, vent piping	Mi	mile	VLF	vertical linear foot
Ea	each	MLF	1,000 linear feet	W	width
EMT	electric metallic tube	MPH	miles per hour	Wk	week
EPDM	ethylene propylene diene monomer	mm	millimeter(s)	W/	with
equip.	equipment	Mo	month	x	by or times
exp.	exposure	MSF	1,000 square feet		
F	Fahrenheit	NEMA	National Electrical Manufacturer's Association		
		NFPA	National Fire Protection Association		
		No.	number		
		NRC	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 composed 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 \$33.67. That's the average for a residential laborer (listed at \$30.14 per hour on page 10) and a residential carpenter (listed at \$37.20 per hour): \$30.14 plus \$37.20 is \$67.34. Divide by 2 to get \$33.67, 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. For example, on page 51 the labor cost listed for $\frac{1}{2}$ " BC wall sheathing is \$0.54 per square foot. That's the installation time (.016 manhours per square foot) multiplied by \$33.67, the average cost per manhour for crew B1.

Residential Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
B1	\$33.67	1 laborer and 1 carpenter	BR	\$35.78	1 lather
B2	\$34.85	1 laborer, 2 carpenters	BS	\$33.09	1 marble setter
B3	\$32.49	2 laborers, 1 carpenter	CF	\$35.34	1 cement mason
B4	\$37.25	1 laborer 1 operating engineer 1 reinforcing iron worker	CT	\$35.14	1 mosaic & terrazzo worker
B5	\$36.86	1 laborer, 1 carpenter 1 cement mason 1 operating engineer 1 reinforcing iron worker	D1	\$36.34	1 drywall installer 1 drywall taper
B6	\$32.74	1 laborer, 1 cement mason	DI	\$36.28	1 drywall installer
B7	\$30.55	1 laborer, 1 truck driver	DT	\$36.40	1 drywall taper
B8	\$36.32	1 laborer 1 operating engineer	HC	\$29.23	1 plasterer helper
B9	\$32.89	1 bricklayer 1 bricklayer's helper	OE	\$42.49	1 operating engineer
BB	\$37.78	1 bricklayer	P1	\$36.70	1 laborer, 1 plumber
BC	\$37.20	1 carpenter	PM	\$43.25	1 plumber
BE	\$40.40	1 electrician	PP	\$34.08	1 painter, 1 laborer
BF	\$34.09	1 floor layer	PR	\$37.26	1 plasterer
BG	\$35.96	1 glazier	PT	\$38.01	1 painter
BH	\$28.00	1 bricklayer's helper	R1	\$35.80	1 roofer, 1 laborer
BL	\$30.14	1 laborer	RI	\$39.12	1 reinforcing iron worker
			RR	\$41.46	1 roofer
			SW	\$41.94	1 sheet metal worker
			T1	\$32.80	1 tile layer, 1 laborer
			TL	\$35.46	1 tile layer
			TR	\$30.96	1 truck driver

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
A1	\$50.82	1 asbestos worker 1 laborer	F6	\$48.90	2 carpenters, 2 laborers 1 tractor operator
AT	\$43.86	1 air tool operator	F7	\$50.87	2 carpenters, 1 laborer 1 tractor operator
AW	\$60.62	1 asbestos worker	F8	\$51.46	2 plasterers 1 plasterer's helper
BM	\$61.36	1 boilermaker	F9	\$46.07	1 laborer, 1 floor layer
BT	\$41.18	1 bricklayer tender	FL	\$51.11	1 floor layer
C1	\$41.95	4 laborers, 1 truck driver	G1	\$48.13	1 glazier, 1 laborer
C2	\$49.27	1 laborer, 2 truck drivers 2 tractor operators	H1	\$54.15	1 carpenter, 1 laborer 1 iron worker (structural) 1 tractor operator
C3	\$47.89	1 laborer, 1 truck driver 1 tractor operator	H2	\$51.44	1 crane operator 1 truck driver
C4	\$42.57	2 laborers, 1 truck driver	H3	\$46.45	1 carpenter, 3 laborers 1 crane operator 1 truck driver
C5	\$46.18	2 laborers, 1 truck driver 1 tractor operator	H4	\$62.26	1 crane operator 6 iron workers (structural) 1 truck driver
C6	\$45.14	6 laborers, 2 truck drivers 2 tractor operators	H5	\$54.19	1 crane operator 2 iron workers (structural) 2 laborers
C7	\$47.61	2 laborers , 3 truck drivers 1 crane operator 1 tractor operator	H6	\$53.44	1 iron worker (structural) 1 laborer
C8	\$46.88	1 laborer, 1 carpenter	H7	\$62.98	1 crane operator 2 iron workers (structural)
C9	\$49.12	1 laborer, 1 crane operator	H8	\$61.05	1 crane operator 4 iron workers (structural) 1 truck driver
CB	\$53.77	1 bricklayer	H9	\$60.22	1 electrician 1 sheet metal worker
CC	\$52.74	1 carpenter	IW	\$65.86	1 iron worker (structural)
CD	\$52.02	1 drywall Installer	LA	\$47.70	1 lather
CE	\$60.08	1 electrician	M1	\$47.48	1 bricklayer 1 bricklayer's tender
CG	\$55.23	1 glazier	M2	\$44.93	1 carpenter, 2 laborers
CL	\$41.02	1 laborer	M3	\$49.86	1 plasterer 1 plasterer's helper
CM	\$51.09	1 cement mason	M4	\$47.45	1 laborer, 1 marble setter
CO	\$57.21	1 crane operator	M5	\$51.57	1 pipefitter, 1 laborer,
CV	\$56.91	1 elevator constructor	M6	\$54.59	1 asbestos worker 1 laborer, 1 pipefitter
D2	\$46.52	1 drywall installer 1 laborer	M8	\$56.85	3 pipefitters, 1 laborer
D3	\$53.48	1 laborer, 1 iron worker (structural), 1 millwright	M9	\$61.10	1 electrician, 1 pipefitter
D4	\$47.30	1 laborer, 1 millwright	MI	\$55.09	2 pipefitters, 1 laborer
D5	\$51.19	1 boilermaker, 1 laborer	MS	\$53.88	marble setter
D6	\$54.71	2 millwrights 1 tractor operator	MT	\$50.83	mosaic & terrazzo worker
D7	\$47.00	1 painter, 1 laborer	MW	\$53.57	millwright
D9	\$49.39	2 millwrights, 1 laborer			
E1	\$51.84	2 electricians, 2 laborers 1 tractor operator			
E2	\$50.55	2 electricians, 2 laborers			
E3	\$51.28	2 electricians, 2 laborers 2 carpenters			
E4	\$50.55	1 electrician, 1 laborer			
F5	\$48.05	3 carpenters, 2 laborers			

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
P5	\$45.14	3 laborers 1 tractor operator 1 truck driver	S8	\$50.75	2 pile drivers, 2 laborers 1 truck driver 1 crane operator 1 tractor operator
P6	\$52.11	1 laborer, 1 plumber	S9	\$48.27	1 pile driver, 2 laborers 1 tractor operator 1 truck driver
P8	\$46.06	1 laborer, 1 cement mason			
P9	\$48.28	1 carpenter, 1 laborer 1 cement mason	SM	\$60.35	1 sheet metal worker
PA	\$52.97	1 painter	SP	\$64.46	1 sprinkler fitter
PD	\$56.66	1 pile driver	SS	\$51.67	1 laborer 2 tractor operators
PF	\$62.12	1 pipefitter	T2	\$52.89	3 laborers, 3 carpenters 3 iron workers (structural)
PH	\$45.07	1 plasterer's helper	T3	\$52.95	1 crane operator 1 truck driver
PL	\$63.19	1 plumber	T4	\$45.93	1 laborer 1 reinforcing iron worker
PS	\$54.65	1 plasterer	T5	\$50.69	1 laborer, 1 mosaic worker
R3	\$46.51	2 roofers, 1 laborer	T6	\$53.91	1 sheet metal worker 1 laborer
RB	\$64.87	1 reinforcing iron worker	TD	\$45.67	2 sheet metal workers 1 laborer
RF	\$49.26	1 roofer	TO	\$56.99	1 truck driver 1 tractor operator
S1	\$49.01	1 laborer 1 tractor operator	U1	\$50.56	1 plumber, 2 laborers 1 tractor operator
S3	\$51.33	1 truck driver 1 tractor operator	U2	\$48.41	1 plumber, 2 laborers
S4	\$41.02	3 laborers			
S5	\$44.00	5 laborers 1 crane operator 1 truck driver			
S6	\$46.34	2 laborers 1 tractor operator			
S7	\$49.01	3 laborers 3 tractor operators			

Residential Division

Craft	1 Base wage per hour	2 Taxable fringe benefits (@5.53% of base wage)	3 Insurance and employer taxes (%)	4 Insurance and employer taxes (\$)	5 Non-taxable fringe benefits (@4.88% of base wage)	6 Total hourly cost used in this book
Bricklayer	\$27.62	\$1.53	24.98%	\$7.28	\$1.35	\$37.78
Bricklayer's Helper	20.47	1.13	24.98	5.40	1.00	28.00
Building Laborer	20.89	1.15	32.14	7.08	1.02	30.14
Carpenter	25.98	1.44	31.04	8.51	1.27	37.20
Cement Mason	26.26	1.45	22.92	6.35	1.28	35.34
Drywall installer	26.88	1.49	23.25	6.60	1.31	36.28
Drywall Taper	26.97	1.49	23.25	6.62	1.32	36.40
Electrician	30.81	1.70	19.67	6.39	1.50	40.40
Floor Layer	25.21	1.39	23.55	6.26	1.23	34.09
Glazier	26.21	1.45	25.38	7.02	1.28	35.96
Lather	26.97	1.49	21.07	6.00	1.32	35.78
Marble Setter	24.93	1.38	21.15	5.56	1.22	33.09
Millwright	26.42	1.46	21.04	5.87	1.29	35.04
Mosaic & Terrazzo Worker	26.48	1.46	21.15	5.91	1.29	35.14
Operating Engineer	31.09	1.72	24.87	8.16	1.52	42.49
Painter	27.88	1.54	24.58	7.23	1.36	38.01
Plasterer	26.60	1.47	28.10	7.89	1.30	37.26
Plasterer Helper	20.87	1.15	28.10	6.19	1.02	29.23
Plumber	31.85	1.76	24.03	8.08	1.56	43.25
Reinforcing Ironworker	27.92	1.54	28.17	8.30	1.36	39.12
Roofer	26.59	1.47	43.11	12.10	1.30	41.46
Sheet Metal Worker	30.50	1.69	25.66	8.26	1.49	41.94
Sprinkler Fitter	31.30	1.73	24.79	8.19	1.53	42.75
Tile Layer	26.72	1.48	21.15	5.96	1.30	35.46
Truck Driver	22.48	1.24	25.87	6.14	1.10	30.96

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 2020.

Column 2, taxable fringe benefits, includes vacation pay, sick leave and other taxable benefits. These fringe benefits average 5.53% 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 4.88% 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 \$10.00 per hour, the calculation would be:

$$\begin{array}{r} 2,080 \text{ hours} \\ \times \$10.00 \text{ per hour} \\ \hline \$20,800 \text{ per year} \end{array}$$

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 31.04%, the rate for carpenters in column 3 on page 10. To increase the annual taxable wage by 31.04%, we'll multiply by 1.3104:

$$\begin{array}{r} \$20,800 \text{ per year} \\ \times 1.3104 \text{ tax & insurance rate} \\ \hline \$27,256 \text{ annual cost} \end{array}$$

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.

$$\begin{array}{r} \$4,124 \text{ medical plan} \\ + 27,256 \text{ annual cost} \\ \hline \$31,380 \text{ total annual cost} \end{array}$$

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:

$$\frac{\$31,380}{2,000} = \$15.69 \text{ per hour}$$

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 \$37.20.

$$\frac{\$15.69}{\$37.20} = .422$$

Your modification factor is 42.2%. Multiply any building carpenter (Craft Code BC) labor costs in the Residential Division of this book by .422 to find your estimated cost. For example, on page 24 the labor cost for installing an 18" long towel bar is \$10.40 per each bar. If installed by your carpenter working at \$10.00 per hour, your estimated cost would be 42.2% of \$10.40 or \$4.39. 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 percentages shown on the following pages to adapt the costs in this book to your job site. Adjust your cost estimate by the appropriate percentages in this table to find the estimated cost for the site selected. Where 0% is shown, it means no modification is required.

Modification factors are listed alphabetically by state and province. Areas within each state are listed 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.

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

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

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.												
Alabama Average																													
Anniston	362	-3	-13	-1	-8%	Long Beach	907-908	3	17	1	9%	Washington	200-205	2	23	1	12%												
Auburn	368	-1	-8	0	-4%	Los Angeles	900-901	3	13	1	8%	Altamonte Springs	327	-1	-6	0	-3%												
Bellamy	369	-2	13	-1	5%	Marysville	959	1	18	0	9%	Bradenton	342	0	-12	0	-6%												
Birmingham	350-352	-3	8	-1	2%	Modesto	953	1	2	0	1%	Brooksville	346	0	-16	0	-7%												
Dothan	363	-1	-13	0	-7%	Mojave	935	0	11	0	5%	Daytona Beach	321	-2	-18	-1	-9%												
Evergreen	364	-2	-20	-1	-10%	Novato	949	3	36	1	18%	Fort Lauderdale	333	3	1	1	2%												
Gadsden	359	-4	-15	-1	-9%	Oakland	945-947	3	48	1	24%	Fort Myers	339	0	-12	0	-6%												
Huntsville	358	1	-3	0	-1%	Orange	928	3	22	1	12%	Fort Pierce	349	-2	-20	-1	-10%												
Jasper	355	-2	-16	-1	-8%	Oxnard	930	3	1	1	2%	Gainesville	326	-1	-18	0	-9%												
Mobile	365-366	-1	-3	0	-2%	Pasadena	910-912	4	16	1	9%	Jacksonville	322	-1	-3	0	-2%												
Montgomery	360-361	-1	-3	0	-2%	Rancho Cordova	956-957	2	6	1	4%	Lakeland	338	-3	-13	-1	-8%												
Scottsboro	357	0	-8	0	-4%	Redding	960	1	-8	0	-3%	Melbourne	329	-2	-15	-1	-8%												
Selma	367	-1	-10	0	-5%	Richmond	948	2	35	1	17%	Miami	330-332	2	-1	1	1%												
Sheffield	356	-1	1	0	0%	Riverside	925	1	7	0	4%	Naples	341	3	-8	1	-2%												
Tuscaloosa	354	1	-9	0	-4%	Sacramento	958	1	6	0	3%	Ocala	344	-3	-23	-1	-12%												
Alaska Average																													
Anchorage	995	16	38	5	26%	San Francisco	941	3	55	1	27%	Orlando	328	0	2	0	1%												
Fairbanks	997	16	40	5	27%	San Jose	950-951	3	33	1	17%	Panama City	324	-2	-21	-1	-11%												
Juneau	998	18	20	6	19%	San Mateo	943-944	4	40	1	21%	Pensacola	325	-1	-17	0	-8%												
Ketchikan	999	3	36	1	18%	Santa Barbara	931	3	11	1	7%	Saint Augustine	320	-1	-4	0	-2%												
King Salmon	996	16	32	5	23%	Santa Rosa	954	3	32	1	16%	Saint Cloud	347	0	-5	0	-2%												
Arizona Average																													
Chambers	865	1	-19	0	-6%	Stockton	952	2	7	1	4%	St Petersburg	337	0	-12	0	-6%												
Douglas	855	0	-18	0	-8%	Sunnyvale	940	3	39	1	20%	Tallahassee	323	0	-13	0	-6%												
Flagstaff	860	2	-17	1	-7%	Van Nys	913-916	3	14	1	8%	Tampa	335-336	-1	-1	0	-1%												
Kingman	864	1	-11	0	-5%	Whittier	906	3	14	1	8%	West Palm Beach	334	1	-5	0	-2%												
Mesa	852	1	5	0	3%	Colorado Average																							
Phoenix	850	1	6	0	3%	Aurora	800-801	3	11	1	7%	Albany	317	-2	-10	-1	-6%												
Prescott	863	3	-16	1	-6%	Boulder	803-804	3	5	1	4%	Athens	306	0	-11	0	-5%												
Show Low	859	2	-18	1	-7%	Colorado Springs	808-809	2	-3	1	0%	Atlanta	303	3	23	1	12%												
Tucson	856-857	0	-10	0	-5%	Denver	802	3	13	1	8%	Augusta	308-309	-2	-2	-1	-2%												
Yuma	853	0	5	0	2%	Durango	813	1	-3	0	-1%	Buford	305	0	-5	0	-2%												
Arkansas Average																													
Batesville	725	0	-20	0	-9%	Fort Morgan	807	2	-6	1	-2%	Calhoun	307	-1	-19	0	-9%												
Camden	717	-4	1	-1	-2%	Glenwood Springs	816	2	6	1	4%	Columbus	318-319	-1	-6	0	-3%												
Fayetteville	727	0	-8	0	-4%	Grand Junction	814-815	1	-1	0	0%	Dublin/Fort Valley	310	-3	-13	-1	-8%												
Fort Smith	729	-1	-14	0	-7%	Greeley	806	3	8	1	5%	Hinesville	313	-2	-11	-1	-6%												
Harrison	726	-1	-25	0	-12%	Longmont	805	3	1	1	2%	Kings Bay	315	-2	-19	-1	-10%												
Hope	718	-3	-15	-1	-8%	Pagosa Springs	811	0	-9	0	-4%	Macon	312	-2	-7	-1	-4%												
Hot Springs	719	-2	-25	-1	-13%	Pueblo	810	-1	2	0	0%	Marietta	300-302	1	8	0	4%												
Jonesboro	724	-1	-18	0	-9%	Salida	812	2	-15	1	-6%	Savannah	314	-1	-7	0	-4%												
Little Rock	720-722	-1	-6	0	-3%	Connecticut Average																							
Pine Bluff	716	-4	-19	-1	-11%	Bridgeport	066	0	13	0	6%	Statesboro	304	-2	-21	-1	-11%												
Russellville	728	0	-9	0	-4%	Bristol	060	1	24	0	12%	Valdosta	316	-1	-1	0	-1%												
West Memphis	723	-3	-1	-1	-2%	Fairfield	064	2	17	1	9%	Hawaii Average																	
California Average																		17 25 6 20%											
Alhambra	917-918	3	15	1	8%	New Haven	065	1	15	0	7%	Aliamanu	968	17	29	6	22%												
Bakersfield	932-933	1	4	0	2%	Norwich	063	0	7	0	3%	Ewa	967	17	23	6	20%												
El Centro	922	1	-1	0	0%	Stamford	068-069	4	21	1	12%	Halawa Heights	967	17	23	6	20%												
Eureka	955	1	13	0	7%	Waterbury	067	1	12	0	6%	Hilo	967	17	23	6	20%												
Fresno	936-938	0	-5	0	-2%	West Hartford	062	1	9	0	5%	Honolulu	968	17	29	6	22%												
Herlong	961	2	17	1	9%	Delaware Average																							
Inglewood	902-905	3	16	1	9%	Dover	199	1	-9	0	-4%	Kailua	968	17	29	6	22%												
Irvine	926-927	3	24	1	13%	Newark	197	2	10	1	6%	Lualualei	967	17	23	6	20%												
Lompoc	934	3	2	1	3%	Wilmington	198	0	9	0	4%	Millanai Town	967	17	23	6	20%												
																		Pearl City	967	17	23	6	20%						
																		Wahiawa	967	17	23	6	20%						
																		Waianae	967	17	23	6	20%						
																		Wailuku (Maui)	967	17	23	6	20%						

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.
Idaho Average		0	-19	0	-9%	Hutchinson	675	-3	-9	-1	-6%	Michigan Average	-2	3	-1	1%	
Boise	837	1	-12	0	-5%	Independence	673	-3	67	-1	29%	Battle Creek	490-491	-3	1	-1	-1%
Coeur d'Alene	838	0	-21	0	-10%	Kansas City	660-662	0	10	0	5%	Detroit	481-482	0	15	0	7%
Idaho Falls	834	-1	-19	0	-9%	Liberal	679	-2	33	-1	14%	Flint	484-485	-3	-5	-1	-4%
Lewiston	835	0	-24	0	-11%	Salina	674	-3	-11	-1	-7%	Grand Rapids	493-495	-2	4	-1	1%
Meridian	836	0	-19	0	-9%	Topeka	664-666	-3	2	-1	-1%	Grayling	497	1	-17	0	-7%
Pocatello	832	-1	-20	0	-10%	Wichita	670-672	-2	-6	-1	-4%	Jackson	492	-3	1	-1	-1%
Sun Valley	833	0	-18	0	-8%							Lansing	488-489	-1	1	0	0%
Illinois Average		-1	9	0	4%	Kentucky Average	-1	-8	0	-4%	Marquette	498-499	-1	7	0	3%	
Arlington Heights	600	1	29	0	14%	Ashland	411-412	-4	-5	-1	-4%	Pontiac	483	-3	29	-1	12%
Aurora	605	2	28	1	14%	Bowling Green	421	0	-11	0	-5%	Royal Oak	480	-2	18	-1	7%
Belleville	622	-2	2	-1	0%	Campton	413-414	-1	-23	0	-11%	Saginaw	486-487	-2	-9	-1	-5%
Bloomington	617	1	-4	0	-1%	Covington	410	-1	5	0	2%	Traverse City	496	-1	-4	0	-2%
Carbondale	629	-3	-6	-1	-4%	Elizabethtown	427	-1	-20	0	-10%						
Carol Stream	601	2	28	1	14%	Frankfort	406	1	13	0	7%	Minnesota Average	0	-1	0	-1%	
Centralia	628	-3	-3	-1	-3%	Hazard	417-418	-2	-19	-1	-10%	Bemidji	566	-1	-11	0	-6%
Champaign	618	-1	-3	0	-2%	Hopkinsville	422	-2	-9	-1	-5%	Brainerd	564	0	-6	0	-3%
Chicago	606-608	2	31	1	15%	Lexington	403-405	1	1	0	1%	Duluth	556-558	-2	7	-1	2%
Decatur	623	-2	-13	-1	-7%	London	407-409	-1	-13	0	-7%	Fergus Falls	565	-1	-20	0	-10%
Galesburg	614	-2	-6	-1	-4%	Louisville	400-402	-1	5	0	2%	Magnolia	561	0	-18	0	-8%
Granite City	620	-3	11	-1	3%	Owensboro	423	-2	-6	-1	-4%	Mankato	560	0	-8	0	-4%
Green River	612	-1	12	0	5%	Paducah	420	-2	2	-1	0%	Minneapolis	553-555	1	28	0	13%
Joliet	604	0	29	0	13%	Pikeville	415-416	-3	-14	-1	-8%	Rochester	559	0	-3	0	-1%
Kankakee	609	-2	-4	-1	-3%	Somerset	425-426	0	23	0	-11%	St Cloud	563	-1	6	0	2%
Lawrenceville	624	-4	-9	-1	-6%	White Plains	424	-3	-6	-1	-4%	St Paul	550-551	1	26	0	12%
Oak Park	603	3	35	1	18%							Thief River Falls	567	0	-5	0	-2%
Peoria	615-616	-1	15	0	6%							Willmar	562	-1	-11	0	-6%
Peru	613	0	4	0	2%	Louisiana Average	-1	7	-1	2%	Mississippi Average	-2	-11	-1	-6%		
Quincy	602	3	31	1	16%	Alexandria	713-714	-3	13	-1	4%	Clarksdale	386	-3	-16	-1	-9%
Rockford	610-611	2	8	-1	3%	Baton Rouge	707-708	0	21	0	10%	Columbus	397	-1	1	0	0%
Springfield	625-627	-2	2	-1	0%	Houma	703	-2	11	-1	4%	Greenville	387	-4	-26	-1	-14%
Urbana	619	-3	-6	-1	-4%	Lafayette	705	0	18	0	8%	Greenwood	389	-3	-18	-1	-10%
Indiana Average		-2	-3	-1	-3%	Lake Charles	706	-2	30	-1	13%	Gulfport	395	-2	-11	-1	-6%
Aurora	470	-1	-9	0	-5%	Minden	710	-2	-8	-1	-5%	Jackson	390-392	-3	-2	-1	-3%
Bloomington	474	1	-6	0	-2%	Monroe	712	-2	-14	-1	-8%	Laurel	394	-3	-11	-1	-7%
Columbus	472	0	-9	0	-4%	New Orleans	700-701	0	5	0	2%	McComb	396	-2	-22	-1	-11%
Elkhart	465	-2	-7	-1	-4%	Shreveport	711	-2	-6	-1	-4%	Meridian	393	-2	8	-1	3%
Evansville	476-477	-2	12	-1	4%	Maine Average	0	-10	0	-5%	Tupelo	388	-1	-13	0	-7%	
Fort Wayne	467-468	-3	1	-1	-1%	Auburn	042	-1	-7	0	-4%	Missouri Average	-1	-5	0	-3%	
Gary	463-464	-4	23	1	8%	Augusta	043	-1	-9	0	-5%	Cape Girardeau	637	-2	-8	-1	-5%
Indianapolis	460-462	-1	10	0	4%	Bangor	044	-1	-11	0	-6%	Caruthersville	638	-1	-15	0	-7%
Jasper	475	-2	-14	-1	-8%	Bath	045	1	-15	0	-6%	Chillicothe	646	-2	-7	-1	-4%
Jeffersonville	471	0	-11	0	-5%	Brunswick	039-040	1	-3	0	-1%	Columbia	652	1	-9	0	-4%
Kokomo	469	-2	-15	-1	-8%	Camden	048	-1	-21	0	-10%	East Lynne	647	-1	10	0	4%
Lafayette	479	-2	-9	-1	-5%	Cutter	046	-1	-15	0	-7%	Farmington	636	-3	-15	-1	-8%
Muncie	473	-4	-13	-1	-8%	Dexter	049	-1	-8	0	-4%	Hannibal	634	0	-4	0	-2%
South Bend	466	-4	0	-1	-2%	Northern Area	047	-2	-16	-1	-8%	Independence	640	-1	13	0	5%
Terre Haute	478	-4	-2	-1	-3%	Portland	041	2	2	1	2%	Jefferson City	650-651	1	-11	0	-5%
Iowa Average		-2	-4	-1	-3%	Maryland Average	1	3	0	2%	Joplin	648	-2	-10	-1	-6%	
Burlington	526	0	2	0	1%	Annapolis	214	4	13	1	8%	Kansas City	641	-2	15	-1	6%
Carroll	514	-3	-20	-1	-11%	Baltimore	210-212	-1	16	0	7%	Kirksville	635	0	-33	0	-15%
Cedar Falls	506	-1	-7	0	-4%	Bethesda	208-209	3	24	1	13%	Knob Noster	653	0	7	0	3%
Cedar Rapids	522-524	0	5	0	2%	Church Hill	216	2	-10	1	-4%	Lebanon	654-655	-2	-23	-1	-12%
Cherokee	510	-2	4	-1	1%	Cumberland	215	-4	-12	-1	-8%	Poplar Bluff	639	-1	-21	0	-10%
Council Bluffs	515	-2	1	-1	-1%	Elkton	219	2	-14	1	-5%	Saint Charles	633	1	2	0	1%
Creston	508	-3	6	-1	1%	Frederick	217	1	13	0	7%	Saint Joseph	644-645	-3	2	-1	-1%
Davenport	527-528	-1	3	0	1%	Laurel	206-207	2	15	1	8%	Springfield	656-658	-2	-15	-1	-8%
Decorah	521	-2	-14	-1	-8%	Salisbury	218	1	-14	0	-6%	St Louis	630-631	-2	20	-1	8%
Des Moines	500-503	-2	13	-1	5%	Massachusetts Average	2	23	1	12%	Montana Average	0	-7	0	-3%		
Dubuque	520	-2	-7	-1	-4%	Ayer	015-016	1	11	0	6%	Billings	590-591	0	-4	0	-2%
Fort Dodge	505	-2	-5	-1	-3%	Bedford	017	3	30	1	15%	Butte	597	1	-7	0	-3%
Mason City	504	0	-6	0	-3%	Boston	021-022	3	77	1	37%	Fairview	592	-1	27	0	12%
Ottumwa	525	0	-13	0	-6%	Brockton	023-024	3	41	1	20%	Great Falls	594	-1	-11	0	-6%
Sheldon	512	0	-15	0	-7%	Cape Cod	026	2	6	1	4%	Havre	595	-1	-19	0	-9%
Shenandoah	516	-3	-26	-1	-14%	Chicopee	010	1	14	0	7%	Helena	596	0	-4	0	-2%
Sioux City	511	-2	14	-1	5%	Dedham	019	2	36	1	18%	Kalispell	599	1	-15	0	-6%
Spencer	513	-1	-14	0	-7%	Fitchburg	014	2	21	1	11%	Miles City	593	-1	-15	0	-7%
Waterloo	507	-4	-1	-1	-3%	Hingham	020	3	37	1	19%	Missoula	598	1	-14	0	-6%
Kansas Average		-2	2	-1	0%	Lawrence	018	2	28	1	14%						
Colby	677	-1	-17	0	-8%	Nantucket	025	3	16	1	9%	Nebraska Average	-1	-17	0	-8%	
Concordia	669	-1	-25	0	-12%	New Bedford	027	1	12	0	6%	Alliance	693	-1	-21	0	-10%
Dodge City	678	-2	-7	-1	-4%	Northfield	013	2	3	1	2%	Columbus	686	-1	-15	0	-7%
Emporia	668	-3	20	-1	8%	Pittsfield	012	1	0	0	1%	Grand Island	688	0	-18	0	-8%
Fort Scott	667	-2	-11	-1	-6%	Springfield	011	-1	18	0	8%	Hastings	689	0	-20	0	-9%
Hays	676	-2	-26	-1	-13%							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	-21	0	-9%	Rochester	144-146	-3	8	-1	2%	Grants Pass	975	2	-13	1	-5%
Norfolk	687	-3	-19	-1	-10%	Rockaway	116	3	18	1	10%	Klamath Falls	976	2	-19	1	-8%
North Platte	691	0	-14	0	-6%	Rome	133-134	-3	-6	-1	-4%	Pendleton	978	0	-7	0	-3%
Omaha	680-681	-1	1	0	0%	Staten Island	103	3	15	1	8%	Portland	970-972	2	19	1	10%
Valentine	692	-2	-31	-1	-15%	Stewart	127	-1	-9	0	-5%	Salem	973	2	-7	1	-2%
Nevada Average		2	0	1	1%	Syracuse	130-132	-3	7	-1	2%	Pennsylvania Average		-3	0	-1	-1%
Carson City	897	2	-12	1	-4%	Tonawanda	141	-4	2	-1	-1%	Allentown	181	-2	8	-1	3%
Elko	898	1	19	0	9%	Utica	135	-4	-8	-1	-6%	Altoona	166	-3	-14	-1	-8%
Ely	893	2	-8	1	-3%	Watertown	136	-2	0	-1	-1%	Beaver Springs	178	-3	-8	-1	-5%
Fallon	894	2	-2	1	0%	West Point	109	1	11	0	6%	Bethlehem	180	-1	10	0	4%
Las Vegas	889-891	2	5	1	3%	White Plains	105-108	3	27	1	14%	Bradford	167	-4	-13	-1	-8%
Reno	895	2	-4	1	-1%							Butler	160	-4	1	-1	-2%
New Hampshire Average		1	-4	0	-1%							Chambersburg	172	-1	-13	0	-7%
Charlestown	036	1	-11	0	-5%							Clearfield	168	2	-8	1	-3%
Concord	034	1	-7	0	-3%							Dubois	158	-2	-19	-1	-10%
Dover	038	1	1	0	1%							East Stroudsburg	183	0	-11	0	-5%
Lebanon	037	2	-8	1	-3%							Erie	164-165	-3	-10	-1	-6%
Littleton	035	-1	-12	0	-6%							Genesee	169	-4	-5	-1	-4%
Manchester	032-033	0	4	0	2%							Greensburg	156	-4	-5	-1	-4%
New Boston	030-031	1	5	0	3%							Harrisburg	170-171	-2	8	-1	3%
New Jersey Average		1	20	0	9%							Hazleton	182	-3	-3	-1	-3%
Atlantic City	080-084	-2	12	-1	4%							Johnstown	159	-4	-16	-1	-9%
Brick	087	2	2	1	2%							Kittanning	162	-4	-9	-1	-6%
Dover	078	1	19	0	9%							Lancaster	175-176	-2	1	-1	-1%
Edison	088-089	1	28	0	13%							Meadville	163	-4	-16	-1	-9%
Hackensack	076	3	18	1	10%							Montrose	188	-3	-6	-1	-4%
Monmouth	077	3	22	1	12%							New Castle	161	-4	-1	-1	-3%
Newark	071-073	1	23	0	11%							Philadelphia	190-191	-3	27	-1	11%
Passaic	070	2	23	1	12%							Pittsburgh	152	-4	17	-1	6%
Paterson	074-075	2	13	1	7%							Pottsville	179	-4	-12	-1	-8%
Princeton	085	-2	24	-1	10%							Punxsutawney	157	-4	-1	-1	-3%
Summit	079	3	32	1	16%							Reading	195-196	-4	9	-1	2%
Trenton	086	-3	19	-1	7%							Scranton	184-185	-2	4	-1	1%
New Mexico Average		0	-17	0	-8%							Somerset	155	-4	-16	-1	-9%
Alamogordo	883	-1	-22	0	-11%							Southeastern	193	0	18	0	8%
Albuquerque	870-871	2	-8	1	-3%							Uniontown	154	-4	-9	-1	-6%
Clovis	881	-2	-22	-1	-11%							Valley Forge	194	-3	27	-1	11%
Farmington	874	2	-4	1	-1%							Warminster	189	-1	24	0	11%
Fort Sumner	882	-3	0	-1	-2%							Warrendale	150-151	-4	16	-1	5%
Gallup	873	1	-17	0	-7%							Washington	153	-4	23	-1	8%
Holman	877	2	-24	1	-10%							Wilkes Barre	186-187	-3	2	-1	-1%
Las Cruces	880	-1	-17	0	-8%							Williamsport	177	-3	-1	-1	-2%
Santa Fe	875	3	-20	1	-8%							York	173-174	-3	2	-1	-1%
Socorro	878	1	-32	0	-14%							Rhode Island Average	1	10	0	5%	
Truth or Consequences	879	-2	-15	-1	-8%							Bristol	028	1	9	0	5%
Tucumcari	884	-1	-17	0	-8%							Coventry	028	1	9	0	5%
New York Average		0	13	0	6%							Cranston	029	1	12	0	6%
Albany	120-123	-1	16	0	7%							Davisville	028	1	9	0	5%
Amityville	117	2	18	1	9%							Narragansett	028	1	9	0	5%
Batavia	140	-3	5	-1	1%							Newport	028	1	9	0	5%
Binghamton	137-139	-3	0	-1	-2%							Providence	029	1	12	0	6%
Bronx	104	2	19	1	10%							Warwick	028	1	9	0	5%
Brooklyn	112	3	12	1	7%							South Carolina Average	-1	-2	0	-1%	
Buffalo	142	-4	7	-1	1%							Aiken	298	0	9	0	4%
Elmira	149	-4	-1	-1	-3%							Beaufort	299	-1	-4	0	-2%
Flushing	113	3	30	1	15%							Charleston	294	-1	0	0	-1%
Garden City	115	3	29	1	15%							Columbia	290-292	0	-4	0	-2%
Hicksville	118	3	27	1	14%							Greenville	296	0	17	0	8%
Ithaca	148	-4	-6	-1	-5%							Myrtle Beach	295	0	-17	0	-8%
Jamaica	114	3	27	1	14%							Rock Hill	297	-1	-11	0	-6%
Jamestown	147	-4	-11	-1	-7%							Spartanburg	293	-2	-6	-1	-4%
Kingston	124	0	-8	0	-4%							South Dakota Average	-1	-12	0	-6%	
Long Island	111	3	62	1	30%							Aberdeen	574	-1	-15	0	-7%
Montauk	119	1	15	0	7%							Mitchell	573	-1	-11	0	-6%
New York (Manhattan)	100-102	3	64	1	31%							Mobridge	576	-2	-18	-1	-9%
New York City	100-102	3	64	1	31%							Pierre	575	-2	-20	-1	-10%
Newcomb	128	-1	2	0	0%							Rapid City	577	-2	-14	-1	-8%
Niagara Falls	143	-4	-8	-1	-6%							Sioux Falls	570-571	0	-2	0	-1%
Plattsburgh	129	1	-3	0	-1%							Watertown	572	-1	-7	0	-4%
Poughkeepsie	125-126	1	2	0	1%							Tennessee Average	0	-5	0	-2%	
Queens	110	4	33	1	17%							Chattanooga	374	-1	5	0	2%
												Clarksville	370	1	2	0	1%
												Cleveland	373	-1	-1	0	-1%

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	-14	0	-7%	Charlottesville	229	1	-15	0	-6%	Gillette	827	-1	7	0	3%
Cookeville	385	0	-18	0	-8%	Chesapeake	233	0	-8	0	-4%	Powell	824	0	-7	0	-3%
Jackson	383	-1	-3	0	-2%	Culpeper	227	1	-12	0	-5%	Rawlins	823	0	17	0	8%
Kingsport	376	0	-11	0	-5%	Farmville	239	-2	-24	-1	-12%	Riverton	825	-1	-12	0	-6%
Knoxville	377-379	-1	-3	0	-2%	Fredericksburg	224-225	1	-11	0	-5%	Rock Springs	829-831	0	2	0	1%
McKenzie	382	-1	-16	0	-8%	Galax	243	-2	-20	-1	-10%	Sheridan	828	1	-8	0	-3%
Memphis	380-381	-1	3	0	1%	Harrisonburg	228	1	-14	0	-6%	Wheatland	822	0	-7	0	-3%
Nashville	371-372	1	4	0	2%	Lynchburg	245	-2	-17	-1	-9%						
Texas Average					-2 12 -1 5%	Norfolk	235-237	0	-4	0	-2%						
Abilene	795-796	-4	0	-1	-2%	Petersburg	238	-2	-5	-1	-3%						
Amarillo	790-791	-2	-2	-1	-2%	Radford	241	-1	-18	0	-9%						
Arlington	760	-1	4	0	1%	Reston	201	3	12	1	7%						
Austin	786-787	1	24	0	12%	Richmond	232	-1	5	0	2%						
Bay City	774	-1	86	0	39%	Roanoke	240	-1	-18	0	-9%						
Beaumont	776-777	-3	43	-1	18%	Staunton	244	0	-15	0	-7%						
Brownwood	768	-3	-14	-1	-8%	Tazewell	246	-3	-10	-1	-6%						
Bryan	778	0	18	0	8%	Virginia Beach	234	0	-6	0	-3%						
Childress	792	-3	-28	-1	-14%	Williamsburg	230-231	0	-6	0	-3%						
Corpus Christi	783-784	-2	41	-1	18%	Winchester	226	0	9	0	4%						
Dallas	751-753	-1	15	0	6%	Washington Average					1 -2 1 0%						
Del Rio	788	-3	4	-1	0%	Clarkston	994	0	-18	0	-8%						
El Paso	798-799	-3	-12	-1	-7%	Everett	982	2	2	1	2%						
Fort Worth	761-762	-1	5	0	2%	Olympia	985	2	-6	1	-2%						
Galveston	775	-3	55	-1	24%	Pasco	993	0	2	0	1%						
Giddings	789	0	13	0	6%	Seattle	980-981	3	21	1	11%						
Greenville	754	-3	9	-1	3%	Spokane	990-992	0	-7	0	-3%						
Houston	770-772	-1	58	0	26%	Tacoma	983-984	2	3	1	2%						
Huntsville	773	-2	59	-1	26%	Vancouver	986	2	4	1	3%						
Longview	756	-2	4	-1	1%	Wenatchee	988	1	-14	0	-6%						
Lubbock	793-794	-3	-11	-1	-7%	Yakima	989	0	-10	0	-5%						
Lufkin	759	-3	20	-1	8%	West Virginia Average					-2 -8 -1 -5%						
McAllen	785	-3	-9	-1	-6%	Beckley	258-259	1	-11	0	-5%						
Midland	797	-3	25	-1	10%	Bluefield	247-248	-1	2	0	0%						
Palestine	758	-2	7	-1	2%	Charleston	250-253	1	8	0	4%						
Plano	750	0	15	0	7%	Clarksburg	263-264	-3	-11	-1	-7%						
San Angelo	769	-3	-9	-1	-6%	Fairmont	266	0	-24	0	-11%						
San Antonio	780-782	-2	19	-1	8%	Huntington	255-257	-1	-7	0	-4%						
Texarkana	755	-3	-15	-1	-8%	Lewisburg	249	-2	-29	-1	-14%						
Tyler	757	-1	-15	0	-7%	Martinsburg	254	-1	-10	0	-5%						
Victoria	779	-2	29	-1	12%	Morgantown	265	-3	-6	-1	-4%						
Waco	765-767	-3	-2	-1	-3%	New Martinsville	262	-2	-18	-1	-9%						
Wichita Falls	763	-3	-16	-1	-9%	Parkersburg	261	-3	5	-1	1%						
Woodson	764	-3	-3	-1	-3%	Romney	267	-4	-10	-1	-7%						
Utah Average					1 -9 1 -3%	Sugar Grove	268	-3	-14	-1	-8%						
Clearfield	840	2	-3	1	0%	Wheeling	260	-3	14	-1	5%						
Green River	845	1	-7	0	-3%	Wisconsin Average					-1 1 0 0%						
Ogden	843-844	0	-19	0	-9%	Amery	540	0	-3	0	-1%						
Provo	846-847	2	-16	1	-6%	Beloit	535	0	10	0	5%						
Salt Lake City	841	2	-1	1	1%	Clam Lake	545	-1	-17	0	-8%						
Vermont Average					-11 0 -5%	Eau Claire	547	-1	-4	0	-2%						
Albany	058	1	-16	0	-7%	Green Bay	541-543	0	6	0	3%						
Battleboro	053	1	-9	0	-4%	La Crosse	546	-2	3	-1	0%						
Beecher Falls	059	1	-19	0	-8%	Ladysmith	548	-2	-1	-1	-2%						
Bennington	052	-1	-12	0	-6%	Madison	537	2	14	1	8%						
Burlington	054	3	5	1	4%	Milwaukee	530-534	0	12	0	6%						
Montpelier	056	2	-10	1	-4%	Oshkosh	549	-1	9	0	4%						
Rutland	057	-1	-13	0	-7%	Portage	539	0	0	0	0%						
Springfield	051	-1	-11	0	-6%	Prairie du Chien	538	-2	-12	-1	-7%						
White River Junction	050	1	-12	0	-5%	Wausau	544	-1	-6	0	-3%						
Virginia Average					0 -8 0 -4%	Wyoming Average					0 -1 0 -1%						
Abingdon	242	-2	-18	-1	-9%	Casper	826	-1	4	0	1%						
Alexandria	220-223	3	18	1	10%	Cheyenne/ Laramie	820	1	-6	0	-2%						

Credits and Acknowledgments

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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.

			Bead diameter			
		Unit	1/8"	1/4"	3/8"	1/2"
Subfloor adhesive, on floors						
12" OC members	CSF	2.69	10.80	24.20	43.10	
16" OC members	CSF	2.02	8.08	18.20	32.30	
20" OC members	CSF	1.62	6.46	14.50	25.90	
24" OC members	CSF	1.35	5.39	12.10	21.60	
Wall sheathing or shear panel adhesive, on walls						
16" OC members	CSF	2.73	10.90	24.60	43.70	
20" OC members	CSF	2.18	8.74	19.70	35.00	
24" OC members	CSF	1.82	7.28	16.40	29.10	
Polystyrene or polyurethane foam panel adhesive, on walls						
12" OC members	CSF	3.58	14.30	32.20	57.20	
16" OC members	CSF	2.68	10.70	24.10	42.90	
20" OC members	CSF	2.15	8.58	19.30	34.30	
24" OC members	CSF	1.79	7.15	16.10	28.60	
Gypsum drywall adhesive						
12" OC members	CSF	1.41	5.65	12.70	22.60	
16" OC members	CSF	1.06	4.24	9.54	17.00	
20" OC members	CSF	.85	3.39	7.63	13.60	
24" OC members	CSF	.71	2.83	6.36	11.30	
Hardboard or plastic panel adhesive, on walls						
12" OC members	CSF	3.58	14.30	32.20	57.20	
16" OC members	CSF	2.68	10.70	24.10	42.90	
20" OC members	CSF	2.15	8.58	19.30	34.30	
24" OC members	CSF	1.79	7.15	16.10	28.60	

		Craft@Hrs	Unit	Material	Labor	Total
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	—	2.79	2.79	
16" OC members	BC@.056	CSF	—	2.08	2.08	
20" OC members	BC@.052	CSF	—	1.93	1.93	
24" OC members	BC@.042	CSF	—	1.56	1.56	
Interior and exterior wall members						
12" OC members	BC@.100	CSF	—	3.72	3.72	
16" OC members	BC@.090	CSF	—	3.35	3.35	
20" OC members	BC@.084	CSF	—	3.12	3.12	
24" OC members	BC@.084	CSF	—	3.12	3.12	

Special purpose adhesives

Construction adhesive, for counters, cabinets, paneling,

brick veneer, ceramic fixtures, shelving,

sets in 10 minutes, 10.5 oz. cartridge

—

Ea

1.71

—

1.71

Epoxy-tie adhesive, bonds concrete, fills cracks to 3/4",

seals doors and windows, anchor grouting,

non-shrink, 22 oz. cartridge

—

Ea

28.90

—

28.90

Gypsum drywall adhesive, waterproof, bonds to wood,

metal, masonry, concrete, 29 oz. cartridge

—

Ea

4.70

—

4.70

Aggregate

	Craft@Hrs	Unit	Material	Labor	Total
Latex FRP adhesive, indoor, bonds wood, concrete, drywall, foamboard, trowel grade, gallon	—	Ea	22.00	—	22.00
Panel insulation adhesive, waterproof, for polyurethane & polystyrene panels, bonds to wood, metal, masonry, concrete, 4.5 lbs.	—	Ea	33.00	—	33.00
Marine adhesive/sealant, 10 oz.	—	Ea	24.00	—	24.00
Project adhesive, rubber-based, bonds plywood, hardboard fiberglass, drywall, foam board, shelving, ceramic fixtures, 10 minute work time, 10.5 oz. cartridge	—	Ea	3.87	—	3.87

General purpose adhesives

	Unit	1 quart can	1 gallon can
Acoustic tile adhesive, solvent base, waterproof, sound deadening type	Ea	—	14.30
Aliphatic resin woodworking glue	Ea	15.00	35.00
Carpet cement, outdoor	Ea	18.90	—
Professional carpenter's glue, multi-purpose	Ea	6.50	28.50
Contact cement, rubber based, waterproof, bonds veneers to plywood, particleboard, wallboard	Ea	19.00	38.00
Gel contact cement	Ea	16.50	—
Resilient flooring adhesive, latex base, adheres to concrete, plywood, felt, sheet flooring	Ea	6.00	17.00
Tile cement, solvent base, ceramic/stone, interior	Ea	11.00	27.80

	Craft@Hrs	Unit	Material	Labor	Total
Aggregate Typical prices, 5 mile haul, 24 ton minimum. See also Roofing, Built-up					
Crushed stone (1.4 tons per CY)					
3/8" stone	—	Ton	29.30	—	29.30
3/4" (Number 3)	—	Ton	27.90	—	27.90
1-1/2" (Number 2)	—	Ton	29.30	—	29.30
Crushed slag, typical prices where available					
3/4" slag	—	Ton	18.80	—	18.80
1-1/2"	—	Ton	19.20	—	19.20
Washed gravel (1.4 tons per CY)					
3/4" gravel	—	Ton	29.30	—	29.30
1-1/2"	—	Ton	29.40	—	29.40
Fill sand (1.35 tons per CY)	—	Ton	13.60	—	13.60
Add per ton less than 24 tons	—	Ton	8.00	—	8.00
Add for delivery over 5 miles, one way	—	Mile	10.00	—	10.00

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	—	—	385.00
Over 2,500 SF to 3,500 SF	—	LS	—	—	436.00
Over 3,500 SF to 5,000 SF	—	LS	—	—	539.00
Over 5,000 SF	—	LS	—	—	795.00
Small residential income properties (duplex, triplex, quadriplex)					
2 to 4 units	—	LS	—	—	693.00
Apartment houses, commercial and industrial buildings					
To \$300,000 valuation	—	LS	—	—	3,330.00
Over \$300,000 to \$1,000,000 valuation	—	LS	—	—	4,360.00
Over \$1,000,000 to \$3,000,000 valuation	—	LS	—	—	4,870.00
Over \$3,000,000 to \$5,000,000 valuation	—	LS	—	—	6,160.00
Other services					
Additional photograph (each)	—	LS	—	—	28.20
Outlying area fee	—	LS	—	—	56.40
Satisfactory Completion (old Form 442 / new Form 1004d)	—	LS	—	—	154.00
Appraisal Update same comps (Form 1004d)	—	LS	—	—	308.00
Operating Income Statement (FNMA 216)	—	LS	—	—	82.10
SFR Rental Survey (FNMA 1007)	—	LS	—	—	82.10
Appraisal review (desk)	—	LS	—	—	180.00
Appraisal review (field)	—	LS	—	—	385.00
Drive-by appraisal (Form 2055) starting at	—	LS	—	—	282.00
Drive-by appraisal (Form 2070/2075)	—	LS	—	—	231.00
Machinery (Fee is based on total value of equipment appraised) Additional charges for travel and lodging may be required					
To \$30,000 valuation	—	LS	—	—	636.00
Over \$30,000 to \$100,000 valuation	—	LS	—	—	852.00
Over \$100,000 to \$500,000 valuation	—	LS	—	—	1,440.00
Over \$500,000 to \$1,000,000 valuation	—	LS	—	—	1,950.00
Over \$1,000,000 to \$5,000,000 valuation	—	LS	—	—	3,330.00
Court testimony (excluding preparation)	—	Day	—	—	1,540.00
Consulting fees are billed at an hourly rate	—	Hour	—	—	195.00
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 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	750.00	800.00
Claims over \$75,000 to \$150,000	LS	1,750.00	1,250.00
Claims over \$150,000 to \$300,000	LS	2,650.00	2,000.00
Claims over \$300,000 to \$500,000	LS	4,000.00	3,500.00
Claims over \$500,000 to \$1,000,000	LS	5,000.00	6,200.00
Claims over \$1,000,000 to \$10,000,000	LS	7,000.00	7,700.00
Claims over \$10,000,000 *	LS	*	12,500.00
No Amount Stated **	LS	7,000.00	7,700.00

* \$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	—	—	356.00
Weekday sessions after the initial consultation	—	Hr	—	—	179.00
Nonrefundable retainer for weekend mediation	—	Ea	—	—	430.00
Weekend mediation sessions	—	Hr	—	—	269.00

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	—	—	1,510.00

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	—	—	607.00
Complex rendering	—	LS	—	—	836.00

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

Simple rendering	—	LS	—	—	781.00
Complex rendering	—	LS	—	—	1,260.00

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

10-25 homes or living units	—	LS	—	—	3,860.00
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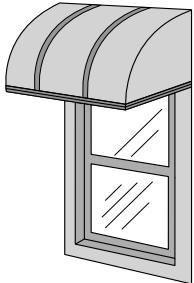
Typical commercial structure

Eye level view	—	LS	—	—	1,700.00
Bird's eye view	—	LS	—	—	1,910.00

Complex commercial structure

Eye level view	—	LS	—	—	2,510.00
Bird's eye view	—	LS	—	—	3,240.00

Awnings and Canopies



	Craft@Hrs	Unit	Material	Labor	Total
Deduct for pen and ink drawings (no color)	—	%	—	—	—33.0
Computer generated perspective drawings using CAD system for design studies					
Custom home	—	LS	—	—	650.00
Large condo or apartment projects	—	LS	—	—	1,640.00
Tract homes	—	LS	—	—	409.00
Commercial structure, line drawing	—	LS	—	—	1,230.00
Awnings and Canopies for Doors and Windows					
Costs for awnings include all hardware. All have adjustable support arms to control angle height and preferred amount of window coverage. For larger size aluminum awnings, price two awnings and add for splice kit below. For commercial grade awnings, see the Industrial and Commercial Division section 12, Furnishings.					
Natural aluminum ribbed awning with clear, weather-resistant finish and 26" arms					
36" wide x 30" long	SW@1.45	Ea	68.10	60.80	128.90
48" wide x 30" long	SW@1.86	Ea	88.10	78.00	166.10
60" wide x 30" long	SW@2.07	Ea	110.00	86.80	196.80
72" wide x 30" long	SW@2.27	Ea	122.00	95.20	217.20
Add for door canopy with 17" drop sides	—	%	50.0	—	—
Custom colored window awnings in stripes or solids, with baked enamel finish and ventilation panels					
30" wide x 24" high	SW@1.45	Ea	111.00	60.80	171.80
36" wide x 36" high	SW@1.45	Ea	166.00	60.80	226.80
48" wide x 48" high	SW@1.87	Ea	281.00	78.40	359.40
48" wide x 60" high	SW@1.87	Ea	397.00	78.40	475.40
60" wide x 72" high	SW@2.07	Ea	435.00	86.80	521.80
72" wide x 72" high	SW@2.26	Ea	596.00	94.80	690.80
Add for splice kit with overlap slats	SW@.218	Ea	23.00	9.14	32.14
Security roll-up awning with pull cord assembly and folding arms, clear weather-resistant finish. Awning rolls down to cover whole window. 48" long, 24" arms					
36" wide	SW@1.52	Ea	210.00	63.70	273.70
48" wide	SW@1.94	Ea	252.00	81.40	333.40
Plastic awning with baked-on acrylic finish, ventilated side panels, and reinforced metal frame, hardware included. 24" drop, 24" projection					
36" wide	BC@1.58	Ea	176.00	58.80	234.80
42" wide	BC@1.75	Ea	195.00	65.10	260.10
48" wide	BC@2.02	Ea	224.00	75.10	299.10
60" wide	BC@2.26	Ea	251.00	84.10	335.10
72" wide	BC@2.47	Ea	271.00	91.90	362.90
96" wide	BC@2.79	Ea	343.00	104.00	447.00
Plastic door canopy with 36" projection					
42" wide	BC@1.80	Ea	366.00	67.00	433.00
Traditional fabric awning, with waterproof, acrylic duck, colorfast fabric, double stitched seams, and tubular metal framing and pull cord assembly. 24" drop, 24" projection					
30" wide	BC@1.35	Ea	61.00	50.20	111.20
36" wide	BC@1.58	Ea	80.20	58.80	139.00
42" wide	BC@1.80	Ea	74.80	67.00	141.80
48" wide	BC@2.02	Ea	87.70	75.10	162.80
Add for 30" drop, 30" projection	—	%	10.0	20.0	—
Cloth canopy patio cover, with front bar and tension support rafters, 9" valance and 8' projection					
8' x 10'	BC@2.03	Ea	370.00	75.50	445.50
8' x 15'	BC@2.03	Ea	510.00	75.50	585.50

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	45.00	—	45.00
Quantities from 16 - 31 units	—	Ea	42.50	—	42.50
Pallet quantities, multiples of 32 units	—	Ea	40.30	—	40.30

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



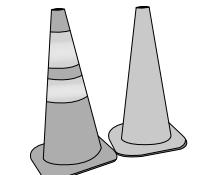
Quantities from 1 - 15 units	—	Ea	53.90	—	53.90
Quantities from 16 - 31 units	—	Ea	50.90	—	50.90
Pallet quantities, multiples of 32 units	—	Ea	48.30	—	48.30

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



Quantities from 1 - 15 units	—	Ea	59.70	—	59.70
Quantities from 16 - 31 units	—	Ea	56.40	—	56.40
Pallet quantities, multiples of 32 units	—	Ea	53.50	—	53.50

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



Quantities from 1 - 15 units	—	Ea	145.00	—	145.00
Quantities from 16 - 31 units	—	Ea	142.00	—	142.00
Pallet quantities, multiples of 32 units	—	Ea	138.00	—	138.00

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

Amber lens	—	Ea	18.10	—	18.10
Red lens	—	Ea	19.00	—	19.00
Batteries, 6 volt (2 needed)	—	Ea	10.50	—	10.50

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	44.60	—	44.60
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Miscellaneous signage/traffic control

"Road Closed", reflectorized, 30" x 48", Engineer Grade	—	Ea	89.80	—	89.80
"Construction Zone", 4' x 4' high intensity grade	—	Ea	246.00	—	246.00

High-rise tripod with 3 orange flags	—	Ea	201.00	—	201.00
Flags	—	Ea	3.81	—	3.81

Traffic cones, PVC Non-reflectorized type	—	Ea	44.60	—	44.60
18" high	—	Ea	6.10	—	6.10
28" high	—	Ea	9.50	—	9.50

Reflectorized type	—	Ea	89.80	—	89.80
18" high	—	Ea	9.79	—	9.79
28" high	—	Ea	16.30	—	16.30
36" high	—	Ea	21.00	—	21.00

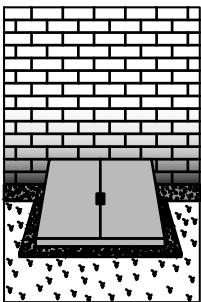
Lane delineator, 42" orange plastic cylinder with 2 reflectors on a 12 pound rubber base	—	Ea	21.20	—	21.20
Mesh signs, orange, 48" x 48", includes brace and clamp	—	Ea	67.00	—	67.00

Hand-held traffic paddles, "Stop" and "Slow"	—	Ea	25.50	—	25.50
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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	51.90	—	51.90
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	9.00	—	9.00
Various colors, 3" x 200', "Danger"	—	Ea	5.50	—	5.50
Utility Highway Barricade Rental					
Lighted units, rental, per day	—	Ea	.35	—	.35
Unlighted units, rental per day	—	Ea	.25	—	.25
Add for pickup and delivery, per trip	—	Ea	35.00	—	35.00
Typical labor cost, place and remove any barricade					
Per use	BL@.160	Ea	—	4.82	4.82

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	699.00	127.00	826.00
SLW Series standard, all sizes	BC@3.41	Ea	692.00	127.00	819.00
Add for powder coating	—	%	28.5	—	—
Ultra Series, polyethylene, all sizes	BC@3.41	Ea	1,040.00	127.00	1,167.00
Add for keyed lock	BC@.160	Ea	76.30	5.95	82.25
Door extensions (available for 19-1/2"H, 55"W, 72"L door only)					
6" deep	BC@1.71	Ea	185.00	63.60	248.60
12" deep	BC@1.71	Ea	222.00	63.60	285.60
18" deep	BC@1.71	Ea	262.00	63.60	325.60

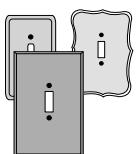
Stair stringers, steel, pre cut for 2" x 10" wood treads (without treads). Price is for a pair, or set of two stringers with hardware.

32" to 39" stair height	BC@1.71	Pr	143.00	63.60	206.60
48" to 55" stair height	BC@1.71	Pr	184.00	63.60	247.60
56" to 64" stair height	BC@1.71	Pr	217.00	63.60	280.60
65" to 72" stair height	BC@1.71	Pr	228.00	63.60	291.60
73" to 78" stair height	BC@1.71	Pr	321.00	63.60	384.60
81" to 88" stair height	BC@1.71	Pr	347.00	63.60	410.60
89" to 97" stair height	BC@1.71	Pr	371.00	63.60	434.60

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

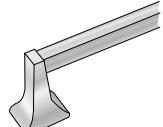
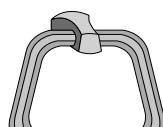


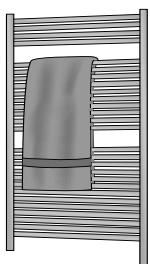
Cup and toothbrush holder, chrome	BC@.258	Ea	13.00	9.60	22.60
Cup holder, porcelain, surface mounted	BC@.258	Ea	9.11	9.60	18.71
Cup, toothbrush & soap holder, recessed	BC@.258	Ea	34.50	9.60	44.10
Cup, toothbrush holder, polished brass	BC@.258	Ea	18.40	9.60	28.00



Electrical plates, chrome plated					
Switch plate, single	BE@.154	Ea	4.83	6.22	11.05
Switch plate, double	BE@.154	Ea	6.37	6.22	12.59
Duplex receptacle plate	BE@.154	Ea	4.83	6.22	11.05
Duplex receptacle and switch	BE@.154	Ea	6.35	6.22	12.57

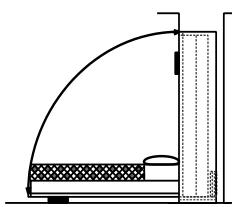
Bathroom Accessories

	Craft@Hrs	Unit	Material	Labor	Total
Grab bars					
Tubular chrome plated, with anchor plates					
Straight bar, 16"	BC@.414	Ea	28.30	15.40	43.70
Straight bar, 24"	BC@.414	Ea	34.50	15.40	49.90
Straight bar, 32"	BC@.414	Ea	37.30	15.40	52.70
"L"- shaped bar, 16" x 32"	BC@.620	Ea	86.70	23.10	109.80
					
Stainless steel, with anchor plates					
Straight bar, 16"	BC@.414	Ea	42.80	15.40	58.20
Straight bar, 24"	BC@.414	Ea	51.50	15.40	66.90
Straight bar, 32"	BC@.414	Ea	56.10	15.40	71.50
"L"- shaped bar, 16" x 32"	BC@.620	Ea	120.00	23.10	143.10
Mirrors, stainless steel framed, surface mount, no light or cabinet					
16" high x 20" wide	BG@.420	Ea	68.40	15.10	83.50
18" high x 24" wide	BG@.420	Ea	79.40	15.10	94.50
18" high x 36" wide	BG@.420	Ea	121.00	15.10	136.10
24" high x 36" wide	BG@.420	Ea	142.00	15.10	157.10
48" high x 24" wide	BG@.420	Ea	176.00	15.10	191.10
Mirrors, wood framed, surface mount, better quality					
18" x 29" rectangular	BG@.420	Ea	84.90	15.10	100.00
20" x 27" oval, oak	BG@.420	Ea	120.00	15.10	135.10
					
Robe hook					
Chrome	BC@.258	Ea	25.40	9.60	35.00
Double, solid brass	BC@.258	Ea	24.50	9.60	34.10
Shower curtain rods, chrome plated					
60", recessed	BC@.730	Ea	29.70	27.20	56.90
66", recessed	BC@.730	Ea	32.70	27.20	59.90
					
Soap holder, surface mounted, with drain holes					
Williamsburg, satin chrome	BC@.258	Ea	60.60	9.60	70.20
Polished brass	BC@.258	Ea	19.80	9.60	29.40
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	15.60	10.40	26.00
24" long, chrome	BC@.280	Ea	18.50	10.40	28.90
30" long, chrome	BC@.280	Ea	21.90	10.40	32.30
36" long, chrome	BC@.280	Ea	24.90	10.40	35.30
18" long, solid brass	BC@.280	Ea	50.70	10.40	61.10
24" long, solid brass	BC@.280	Ea	53.30	10.40	63.70
					
Towel rack, swing-arm, chrome, 3 bars, 12" L					
Towel rings					
Williamsburg chrome and brass	BC@.280	Ea	48.00	10.40	58.40
Williamsburg chrome and porcelain	BC@.280	Ea	45.90	10.40	56.30
Towel shelf, chrome, 24" L with bar below					
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	774.00	34.30	808.30
26" high, 24" wide, standard colors	BE@.850	Ea	826.00	34.30	860.30
26" high, 24" wide, chrome finish	BE@.850	Ea	2,550.00	34.30	2,584.30
					

Blueprinting

	Craft@Hrs	Unit	Material	Labor	Total
35" high, 16" wide, standard colors	BE@1.00	Ea	967.00	40.40	1,007.40
35" high, 24" wide, standard colors	BE@1.00	Ea	918.00	40.40	958.40
35" high, 24" wide, chrome finish	BE@1.00	Ea	3,080.00	40.40	3,120.40
44" high, 16" wide, standard colors	BE@1.10	Ea	967.00	44.40	1,011.40
44" high, 24" wide, standard colors	BE@1.10	Ea	1,020.00	44.40	1,064.40
44" high, 24" wide, chrome finish	BE@1.10	Ea	3,370.00	44.40	3,414.40
Add for direct wire w/ control panel	BE@.100	Ea	213.00	4.04	217.04
Add for wall plug in	BE@.100	Ea	285.00	4.04	289.04
Heated towel rack accessories					
Programmable control panel	BE@.250	Ea	277.00	10.10	287.10
Pull out drying racks	BE@.250	Ea	77.70	10.10	87.80
Robe knobs	BE@.150	Ea	50.00	6.06	56.06
Towel bar accents with standard colors	BE@.150	Ea	99.80	6.06	105.86
Towel bar accents with chrome finish	BE@.150	Ea	134.00	6.06	140.06
Robe knob accents (all styles)	BE@.150	Ea	232.00	6.06	238.06
Tub or shower chairs					
Wall-hung elevated fixed seat	BE@.750	Ea	36.80	30.30	67.10
White adjustable seat	BE@.750	Ea	68.60	30.30	98.90

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	817.00	182.00	999.00
Double, frames and mechanisms	B1@5.41	Ea	856.00	182.00	1,038.00
Queen, frames and mechanisms	B1@5.41	Ea	894.00	182.00	1,076.00
King, frames and mechanisms	B1@5.41	Ea	982.00	182.00	1,164.00
Add for wood-tone melamine cabinet	—	LS	1,450.00	—	1,450.00
Add for white melamine cabinet	—	LS	1,290.00	—	1,290.00

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	—	—	.19
1,001-2,000 SF	—	SF	—	—	.18
2,001-to 3,000 SF	—	SF	—	—	.16
3,001-4,000 SF	—	SF	—	—	.09
4,001 SF and higher	—	SF	—	—	.08
Presentation blackline (heavy paper)	—	SF	—	—	.56
Sepia	—	SF	—	—	.83
Mylar	—	SF	—	—	2.78

Xerographic prints

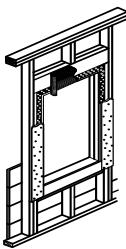
Vellum	—	SF	—	—	1.11
Erasable vellum	—	SF	—	—	1.39
Mylar	—	SF	—	—	2.78
Enlargements (bond)	—	SF	—	—	.67
Reductions (bond, per sheet)	—	Ea	—	—	2.77

Building Inspection Service

	Craft@Hrs	Unit	Material	Labor	Total
Plotting prints					
Translucent bond	—	SF	—	—	1.67
Vellum	—	SF	—	—	1.94
Erasable vellum	—	SF	—	—	2.76
Mylar	—	SF	—	—	2.78
Photo prints					
Mylar	—	SF	—	—	6.22
Add for local pickup and delivery, round trip	—	LS	—	—	16.50
Building Inspection Service (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	—	—	355.00
Add for additional 1,000 SF or fraction	—	LS	—	—	109.00
Add for out buildings (each)	—	LS	—	—	54.60
Add for houses over 50 years old	—	LS	—	—	81.80
Add per room for houses with over 10 rooms	—	Ea	—	—	65.40
Add per room for houses with over 15 rooms	—	Ea	—	—	71.00
Add for swimming pool, spa or sauna	—	LS	—	—	216.00
Add for soil testing (expansive soil only)	—	LS	—	—	218.00
Add for water testing (coliform only)	—	LS	—	—	76.50
Add for warranty protection					
Houses to 10 rooms & 50 years old	—	LS	—	—	272.00
Houses over 50 years old	—	LS	—	—	293.00
Houses over 10 rooms	—	LS	—	—	295.00
Multi-family structures					
Two family residence base fee	—	LS	—	—	493.00
Apartment or condominium base fee	—	LS	—	—	272.00
Warranty protection (base cost)	—	LS	—	—	272.00
Add for each additional unit	—	LS	—	—	54.70
Add for each family living unit					
Standard inspection	—	LS	—	—	54.60
Detailed inspection	—	LS	—	—	81.20
Add for swimming pool, spa, sauna	—	LS	—	—	81.80
Add for potable water quality testing	—	LS	—	—	246.00
Add for water quantity test, per well	—	LS	—	—	164.00
Add for soil testing (EPA toxic)	—	LS	—	—	1,640.00
Add for soil testing (lead)	—	LS	—	—	49.30
Add for lead paint testing, full analysis, per room	—	LS	—	—	43.60
Hazards testing for single and multi-family dwellings					
Urea-formaldehyde insulation testing	—	LS	—	—	190.00
Asbestos testing	—	LS	—	—	193.00
Radon gas testing	—	LS	—	—	137.00
Geotechnical site examination, typical price	—	LS	—	—	438.00

Building Paper

	Craft@Hrs	Unit	Material	Labor	Total
Building Paper 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	.06	—	.06
15 lb., F40 (432 SF roll)	—	SF	.05	—	.05
30 lb. (216 SF roll)	—	SF	.12	—	.12
Asphalt shake felt, 18" x 72"					
30 lb. (108 SF roll)	—	SF	.19	—	.19
Building paper, 40" wide					
Single ply, black (1,078 SF roll)	—	SF	.05	—	.05
Two ply (539 SF roll)	—	SF	.07	—	.07
Aquabar™, two layer, laminated with asphalt, Fortifiber™ products					
Class A, 36" wide, 30-50-30					
(1,000 SF roll)	—	SF	.05	—	.05
Class B, 36" wide, 30-30-30					
(500 SF roll)	—	SF	.07	—	.07
Ice and water shield, self-adhesive rubberized asphalt and poly					
225 SF roll	—	SF	.92	—	.92
High temperature, 225 SF roll	—	SF	1.01	—	1.01
"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	.10	—	.10
"Super Jumbo Tex" two-ply, 60 minute, asphalt saturated Kraft					
(162 SF roll)	—	SF	.11	—	.11
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	.15	—	.15
Vycor window and door flashing, self adhesive, Grace					
6" x 75' roll, 25 mil thickness	—	SF	1.78	—	1.78
Vycor deck protector, self adhesive joist flashing, Grace					
4" x 75' roll, Roll covers 66 LF of joist	—	LF	1.79	—	1.79
Plasterkraft grade D weather-resistive sheathing paper, 40" wide					
Super 60 minute (500 SF roll)	—	SF	.04	—	.04
Ten minute 2-ply (500 SF roll)	—	SF	.03	—	.03
Roof flashing paper, seals around skylights, dormers, vents, valleys and eaves, rubberized, fiberglass reinforced, self-adhesive					
GAF StormGuard™ Roll covers 200 SF	—	SF	.54	—	.54
Roof underlayment, for use under shingles, granular surface					
Weatherlock® 200 SF roll	—	SF	.60	—	.60
Tri-Flex roof underlayment, for use under shingles, tile, slate or metal roofing					
48" x 250', 1,000 SF roll	—	SF	.13	—	.13
Below grade vapor barrier, Fortifiber™ Moistop					
fiberglass reinforced Kraft between 2 layers of polyethylene)					
8' x 250' roll (2,000 SF roll)	—	SF	.20	—	.20



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	.25	—	.25
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	.08	—	.08
Protective paper, Fortifiber™ Seekure					
(fiberglass reinforcing strands and nonstaining adhesive between 2 layers of Kraft)					
8" x 300' roll, (2,400 SF)	—	SF	.09	—	.09
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	.14	—	.14
House wrap tape, 2" x 165'	—	LF	.09	—	.09
Labor to install building papers					
Felts, vapor barriers, infiltration barriers, building papers on walls					
Tack stapled, typical	BC@.002	SF	—	.07	.07
Heavy stapled, typical	BC@.003	SF	—	.11	.11
Felts, vapor barriers, infiltration barriers, building papers on ceilings and roofs					
Tack stapled, typical	BC@.004	SF	—	.15	.15
Heavy stapled, typical	BC@.006	SF	—	.22	.22
Self-adhesive, typical	BC@.006	SF	—	.22	.22
Curing papers, protective papers and vapor barriers,					
minimal fasteners	BC@.001	SF	—	.04	.04
Flashing papers, 6" to 8" wide	BC@.010	LF	—	.37	.37

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 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	BC@.521	LF	171.00	19.40	190.40
Wall cabinets, 30" high, 12" deep	BC@.340	LF	89.60	12.60	102.20

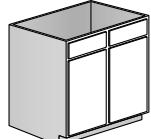
Cabinets, Kitchen (See the note above on cabinet costs.)

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

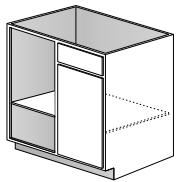
9" wide, tray divider	BC@.461	Ea	161.00	17.10	178.10
12" wide, 1 door, 1 drawer	BC@.461	Ea	216.00	17.10	233.10
15" wide, 1 door, 1 drawer	BC@.638	Ea	231.00	23.70	254.70
18" wide, 1 door, 1 drawer	BC@.766	Ea	243.00	28.50	271.50
21" wide, 1 door, 1 drawer	BC@.766	Ea	264.00	28.50	292.50
24" wide, 1 door, 1 drawer	BC@.911	Ea	270.00	33.90	303.90



DRAWER BASE



SINK BASE



BLIND CORNER BASE

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

24" wide, 1 door, 1 drawer front	BC@.740	Ea	231.00	27.50	258.50
30" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	277.00	28.50	305.50
33" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	292.00	28.50	320.50
36" wide, 2 doors, 2 drawer fronts	BC@.766	Ea	299.00	28.50	327.50
42" wide, 2 doors, 2 drawer fronts	BC@.911	Ea	330.00	33.90	363.90
48" wide, 2 doors, 2 drawer fronts	BC@.911	Ea	363.00	33.90	396.90

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

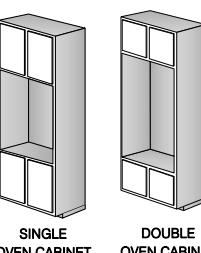
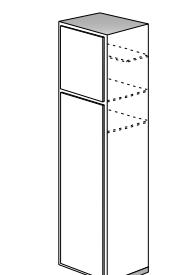
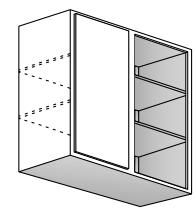
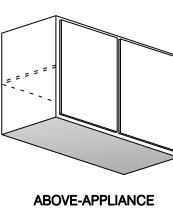
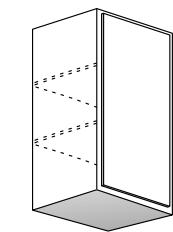
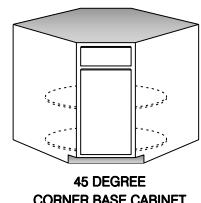
27" wide, 2 door, 2 drawer front	BC@1.25	Ea	357.00	46.50	403.50
30" wide, 2 doors, 2 drawer fronts	BC@1.25	Ea	376.00	46.50	422.50
33" wide, 2 doors, 2 drawer fronts	BC@1.25	Ea	394.00	46.50	440.50
36" wide, 2 doors, 2 drawer fronts	BC@1.35	Ea	415.00	50.20	465.20
42" wide, 2 doors, 2 drawer fronts	BC@1.50	Ea	432.00	55.80	487.80
48" wide, 2 doors, 2 drawer fronts	BC@1.71	Ea	480.00	63.60	543.60

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

Minimum 36", maximum 39" at wall	BC@1.39	Ea	264.00	51.70	315.70
Minimum 39", maximum 42" at wall	BC@1.50	Ea	284.00	55.80	339.80
Corner base cabinet, revolving shelves 34-1/2" high x 36" wide at walls	BC@2.12	Ea	409.00	78.90	487.90

Cabinets, Kitchen

	Craft@Hrs	Unit	Material	Labor	Total
Corner sink front, 34-1/2" high 40" wide at walls	BC@2.63	Ea	231.00	97.80	328.80
Wall cabinets, adjustable shelves, 30" high, 12" deep 9" wide, 1 door	BC@.461	Ea	146.00	17.10	163.10
12" wide or 15" wide, 1 door	BC@.461	Ea	158.00	17.10	175.10
18" wide, 1 door	BC@.638	Ea	187.00	23.70	210.70
21" wide, 1 door	BC@.638	Ea	193.00	23.70	216.70
24" wide, 1 door	BC@.766	Ea	207.00	28.50	235.50
27" wide, 2 doors	BC@.766	Ea	243.00	28.50	271.50
30" wide, 2 doors	BC@.911	Ea	243.00	33.90	276.90
33" wide, 2 doors	BC@.911	Ea	264.00	33.90	297.90
36" wide, 2 doors	BC@1.03	Ea	278.00	38.30	316.30
42" wide, 2 doors	BC@1.03	Ea	299.00	38.30	337.30
48" wide, 2 doors	BC@1.16	Ea	328.00	43.20	366.20
Above-appliance wall cabinets, 12" deep 12" high, 30" wide, 2 doors	BC@.461	Ea	154.00	17.10	171.10
15" high, 30" wide, 2 doors	BC@.461	Ea	175.00	17.10	192.10
15" high, 33" wide, 2 doors	BC@.537	Ea	188.00	20.00	208.00
15" high, 36" wide, 2 doors	BC@.638	Ea	193.00	23.70	216.70
18" high, 18" wide, 2 doors	BC@.537	Ea	146.00	20.00	166.00
18" high, 30" wide, 2 doors	BC@.766	Ea	193.00	28.50	221.50
18" high, 36" wide, 2 doors	BC@.911	Ea	213.00	33.90	246.90
Corner wall cabinets, 30" high, 12" deep 24" at each wall, fixed shelves	BC@1.03	Ea	264.00	38.30	302.30
24" at each wall, revolving shelves	BC@1.03	Ea	355.00	38.30	393.30
Blind corner wall cabinets, 30" high 24" minimum, 1 door	BC@1.03	Ea	200.00	38.30	238.30
36" minimum, 1 door	BC@1.32	Ea	243.00	49.10	292.10
42" minimum, 2 doors	BC@1.20	Ea	305.00	44.60	349.60
Utility cabinets, 66" high, 12" deep, no shelves 18" wide	BC@1.32	Ea	305.00	49.10	354.10
24" wide	BC@1.71	Ea	349.00	63.60	412.60
Utility cabinets, 66" high, 24" deep, add shelf cost below 18" wide	BC@1.24	Ea	323.00	46.10	369.10
24" wide	BC@1.71	Ea	383.00	63.60	446.60
Add for utility cabinet revolving shelves, includes mounting hardware 18" wide x 24" deep	BC@.360	Ea	277.00	13.40	290.40
24" wide x 24" deep	BC@.360	Ea	325.00	13.40	338.40
Add for utility cabinet plain shelves 18" wide x 24" deep	BC@.541	Ea	93.80	20.10	113.90
24" wide x 24" deep	BC@.541	Ea	98.30	20.10	118.40
Oven cabinets, 66" high, 24" deep 27" wide, single oven	BC@2.19	Ea	387.00	81.50	468.50
27" wide, double oven	BC@2.19	Ea	293.00	81.50	374.50



Cabinets, Kitchen

	Craft@Hrs	Unit	Material	Labor	Total
Microwave cabinet, with trim, 21" high, 20" deep, 30" wide	BC@.986	Ea	233.00	36.70	269.70
Additional labor costs for cabinets					
Tall utility, pantry, or oven cabinets	BC@2.00	Ea	—	74.40	74.40
Tall wall cabinet to counter level	BC@1.50	Ea	—	55.80	55.80
Hood cabinet over a range with vent cutout	BC@1.50	Ea	—	55.80	55.80
3/4" raised end panels applied to cabinet ends	BC@.250	Ea	—	9.30	9.30
Refrigerator end panels, cut, fit, install	BC@.500	Ea	—	18.60	18.60
Cabinet end panels, most sizes, per panel					
Refrigerator end panels	BC@.557	Ea	—	20.70	20.70
Refrigerator end panels with return	BC@1.00	Ea	—	37.20	37.20
Applied decorative end panels	BC@.334	Ea	—	12.40	12.40
Mitered island end or back panels	BC@.667	Ea	—	24.80	24.80
Dishwasher return panels	BC@.667	Ea	—	24.80	24.80
Precut filler panels installed between cabinets, per panel					
Most base or wall fillers	BC@.200	Ea	—	7.44	7.44
Most base or wall fillers with overlays	BC@.400	Ea	—	14.90	14.90
Tall filler panels over 36"	BC@.268	Ea	—	9.97	9.97
Tall filler panels over 36" with overlays	BC@.535	Ea	—	19.90	19.90
Corner filler panels	BC@.224	Ea	—	8.33	8.33
Corner fillers panels with overlays	BC@.448	Ea	—	16.70	16.70
Angled corner filler panels	BC@.268	Ea	—	9.97	9.97
Angled corner filler panels with overlays	BC@.536	Ea	—	19.90	19.90
Moldings and trim for cabinet work					
Scribe molding, per 8' length	BC@.224	Ea	—	8.33	8.33
Scribe molding, per linear foot	BC@.028	LF	—	1.04	1.04
Crown molding, per 8' length, miter cut	BC@.448	Ea	—	16.70	16.70
Crown molding, per 8' length, butt joint	BC@.180	Ea	—	6.70	6.70
Crown plate and riser, per miter cut	BC@.180	Ea	—	6.70	6.70
Crown plate and riser, per straight cut	BC@.112	Ea	—	4.17	4.17
Applied molding, per miter cut	BC@.112	Ea	—	4.17	4.17
Applied molding, per straight cut	BC@.067	Ea	—	2.49	2.49
Light rail molding, per miter cut	BC@.224	Ea	—	8.33	8.33
Light rail molding, per straight cut	BC@.067	Ea	—	2.49	2.49
Furniture toe kick, per 8' length	BC@.334	Ea	—	12.40	12.40
Furniture toe kick, per linear foot	BC@.042	LF	—	1.56	1.56
Valance, straight, per 8' length	BC@.334	Ea	—	12.40	12.40
Valance, with side returns or cap, 8' length	BC@.667	Ea	—	24.80	24.80
Mantle or hood molding, length to 8'	BC@.800	Ea	—	29.80	29.80
Corbels, plain	BC@.224	Ea	—	8.33	8.33
Corbels, on uprights	BC@.334	Ea	—	12.40	12.40
Enkeboll molding, miter cut, 8' length	BC@.667	Ea	—	24.80	24.80
Enkeboll molding, straight cut, 8' length	BC@.180	Ea	—	6.70	6.70
Posts, to 8' length	BC@.500	Ea	—	18.60	18.60
Pilasters	BC@.334	Ea	—	12.40	12.40
Cabinet feet, per cabinet	BC@.334	Ea	—	12.40	12.40
Cabinet extras					
Scribing in wood tops	BC@.133	LF	—	4.95	4.95
Job built 2 x 4 support wall to 42" high	BC@.334	LF	—	12.40	12.40
Framing for range support or sink cutout	BC@.667	Ea	—	24.80	24.80

Carpentry

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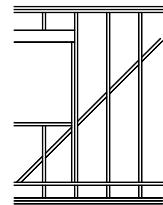
Carpentry See also carpentry items in other sections: Carpentry Steel Framing, Cabinets, Ceilings, Closet Door Systems, Countertops, Cupolas, Doors, Entrances, Flooring, Framing Connectors, Hardboard, Hardware, Lumber, Molding, Paneling, Shutters, Siding, Skylights, Soffits, Stairs, Thresholds, and Weatherstripping.

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	686.00	—	686.00
Using 1/2" OSB sheathing at	—	MSF	399.00	—	399.00
Using 7/16" OSB sheathing at	—	MSF	268.00	—	268.00
Using 5/8" OSB sheathing at	—	MSF	461.00	—	461.00
Using 1/2" CDX sheathing at	—	MSF	648.00	—	648.00
Using 5/8" CDX sheathing at	—	MSF	965.00	—	965.00
Single story, conventional foundation	B1@.237	SF	5.14	7.99	13.13
Single story, concrete slab foundation	B1@.180	SF	3.50	6.07	9.57
First of two floors, conventional foundation	B1@.203	SF	4.11	6.84	10.95
First of two floors, concrete slab foundation	B1@.146	SF	2.47	4.92	7.39
Second floor of a two-story residence	B1@.191	SF	4.03	6.44	10.47
Add for plywood sheathing	—	%	14.3	—	—



Framing a single story residence, conventional crawl-space foundation

Sills, pier blocks, floor beams (145 BF per 1,000 SF)	B1@.018	SF	.10	.61	.71
Floor joists, doublers, blocking, bridging (1,480 BF per 1,000 SF)	B1@.028	SF	1.01	.94	1.95
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	.53	.37	.90
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	1.54	3.13	4.67
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	.73	1.52	2.25
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC, (1,340 BF per 1,000 SF)	B1@.032	SF	.92	1.08	2.00
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	.31	.34	.65
Total framing, single story, conventional foundation	B1@.237	SF	5.14	7.99	13.13
Add for plywood sheathing	—	%	19.8	—	—

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	1.54	3.13	4.67
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	.73	1.52	2.25
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC, (1,340 BF per 1,000 SF)	B1@.032	SF	.92	1.08	2.00
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	.31	.34	.65
Total framing, single story, concrete slab foundation	B1@.180	SF	3.50	6.07	9.57
Add for plywood sheathing	—	%	12.5	—	—

Carpentry, Assemblies

	Craft@Hrs	Unit	Material	Labor	Total
Framing the first of two floors, conventional crawl-space foundation					
Sills, pier blocks, floor beams (145 BF per 1,000 SF)	B1@.018	SF	.10	.61	.71
Floor joists, doublers, blocking, bridging (1,480 BF per 1,000 SF)	B1@.028	SF	1.01	.94	1.95
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	.53	.37	.90
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	1.54	3.13	4.67
Rough stairway, 15 risers and landing (96 BF of dimension lumber and 128 SF of plywood per 1,000 SF)	B1@.008	SF	.20	.27	.47
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	.73	1.52	2.25
Total framing, 1st of 2 floors, crawl-space foundation	B1@.203	SF	4.11	6.84	10.95
Add for plywood sheathing	—	%	14.1	—	—
Framing the first of two floors, 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	1.54	3.13	4.67
Rough stairway, 15 risers and landing (96 BF of dimension lumber and 128 SF of plywood per 1,000 SF)	B1@.008	SF	.73	.27	1.00
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	.20	1.52	1.72
Total framing, first of two floors, concrete foundation	B1@.146	SF	2.47	4.92	7.39
Framing the second story of a residence					
Subflooring, 5/8" OSB (1,150 SF per 1,000 SF)	B1@.011	SF	.53	.37	.90
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	1.54	3.13	4.67
Ceiling joists, header and end joists, backing, blocking and bracing (1,060 BF per 1,000 SF)	B1@.045	SF	.73	1.52	2.25
Rafters, braces, collar beams, ridge boards, 2" x 8" rafters 16" OC (1,340 BF per 1,000 SF)	B1@.032	SF	.92	1.08	2.00
Roof sheathing, 7/16" OSB (1,150 SF per 1,000 SF)	B1@.010	SF	.31	.34	.65
Total framing, second floor of a two-story residence	B1@.191	SF	4.03	6.44	10.47
Add for plywood sheathing	—	%	15.8	—	—

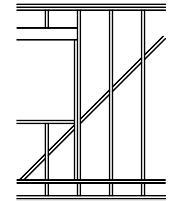
Floor Assemblies Costs for wood framed floor joists with subflooring and R-19 insulation. These costs include the floor joists, subflooring as described, blocking, nails and 6-1/4" thick R-1.9 fiberglass insulation between the floor joists. Figures include box or band joists and typical double joists. 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	686.00	—	686.00
Using 5/8" CDX plywood subfloor at	—	MSF	965.00	—	968.00
Using 3/4" CDX plywood subfloor at	—	MSF	724.00	—	724.00
Using 7/16" OSB subfloor at	—	MSF	268.00	—	268.00
Using 5/8" OSB subfloor at	—	MSF	461.00	—	461.00
Using 3/4" OSB T&G subfloor at	—	MSF	598.00	—	598.00

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	1.95	1.35	3.30
2" x 8" joists	B1@.041	SF	2.29	1.38	3.67
2" x 10" joists	B1@.043	SF	2.62	1.45	4.07
2" x 12" joists	B1@.044	SF	3.37	1.48	4.85
Floor joists 16" OC, R-19 insulation and OSB subflooring					
5/8" OSB subfloor					
2" x 6" joists	B1@.040	SF	2.14	1.35	3.49
2" x 8" joists	B1@.041	SF	2.49	1.38	3.87
2" x 10" joists	B1@.043	SF	2.81	1.45	4.26
2" x 12" joists	B1@.044	SF	3.56	1.48	5.04
3/4" OSB subfloor					
2" x 6" joists	B1@.042	SF	2.28	1.41	3.69
2" x 8" joists	B1@.043	SF	2.62	1.45	4.07
2" x 10" joists	B1@.045	SF	2.95	1.52	4.47
2" x 12" joists	B1@.046	SF	3.69	1.55	5.24
Floor joists 16" OC, R-19 insulation and plywood subflooring					
5/8" plywood subfloor					
2" x 6" joists	B1@.040	SF	2.30	1.35	3.65
2" x 8" joists	B1@.041	SF	2.64	1.38	4.02
2" x 10" joists	B1@.043	SF	2.97	1.45	4.42
2" x 12" joists	B1@.044	SF	3.71	1.48	5.19
3/4" plywood subfloor					
2" x 6" joists	B1@.042	SF	2.41	1.41	3.82
2" x 8" joists	B1@.043	SF	2.75	1.45	4.20
2" x 10" joists	B1@.045	SF	3.08	1.52	4.60
2" x 12" joists	B1@.046	SF	3.82	1.55	5.37
For different type insulation					
Fiberglass batts					
10" thick R-30, add	—	SF	.40	—	.40
12" thick R-38, add	—	SF	1.00	—	1.00

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	659.00	—	659.00
Using 2 x 6 lumber at	—	MBF	645.00	—	645.00
Using 1/2" gypsum wallboard at	—	SF	.39	—	.39
Using 5/8" gypsum wallboard at	—	SF	.40	—	.40

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	1.33	2.15	3.48
Cost per running foot, for 8' high walls	B1@.512	LF	10.70	17.20	27.90
2" x 4" stud walls with 1/2" gypsum drywall one side, ready for painting					
Cost per square foot of wall	B1@.046	SF	.94	1.55	2.49
Cost per running foot, for 8' high walls	B1@.368	LF	7.55	12.40	19.95
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	1.35	2.29	3.64
Cost per running foot, for 8' high walls	B1@.544	LF	10.80	18.30	29.10

Carpentry, Assemblies

	Craft@Hrs	Unit	Material	Labor	Total
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	.95	1.62	2.57
Cost per running foot, for 8' high walls	B1@.384	LF	7.63	12.90	20.53
2" x 6" stud walls with 1/2" gypsum drywall both sides, ready for painting					
Cost per square foot of wall	B1@.072	SF	1.61	2.42	4.03
Cost per running foot, for 8' high walls	B1@.576	LF	12.90	19.40	32.30
2" x 6" stud walls with 1/2" gypsum drywall one side, ready for painting					
Cost per square foot of wall	B1@.054	SF	1.22	1.82	3.04
Cost per running foot, for 8' high walls	B1@.432	LF	9.75	14.50	24.25
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	1.63	2.56	4.19
Cost per running foot, for 8' high walls	B1@.608	LF	13.00	20.50	33.50
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	1.23	1.89	3.12
Cost per running foot, for 8' high walls	B1@.448	LF	9.83	15.10	24.93
Exterior wall assemblies					
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	1,390.00	—	1,390.00
Cost per square foot of wall	B1@.068	SF	2.90	2.29	5.19
Cost per running foot, for 8' high walls	B1@.544	LF	23.20	18.30	41.50
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	3.32	2.59	5.91
Cost per running foot, for 8' high walls	B1@.616	LF	26.60	20.70	47.30
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	2,920.00	—	2,920.00
Cost per square foot of wall	B1@.074	SF	4.43	2.49	6.92
Cost per running foot, for 8' high wall	B1@.592	LF	35.40	19.90	55.30
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	4.85	2.79	7.64
Cost per running foot, for 8' high wall	B1@.664	LF	38.80	22.40	61.20
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	4.72	1.68	6.40
Cost per running foot, for 8' high wall	B1@.400	LF	37.80	13.50	51.30
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	5.15	1.99	7.14
Cost per running foot, for 8' high wall	B1@.472	LF	41.20	15.90	57.10
Add for different type gypsum board					
1/2" or 5/8" moisture resistant greenboard	—	SF	.10	—	.10
Cost per SF, greenboard per side, add					
1/2" or 5/8" moisture resistant greenboard	—	LF	.80	—	.80
Cost per running foot per side 8' high					
5/8" thick fire rated type X gypsum drywall	—	SF	.01	—	.01
Cost per SF, per side, add					
5/8" thick fire rated type X gypsum drywall	—	LF	.08	—	.08
Cost per running foot per side 8' high					

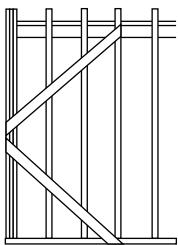
Carpentry, Assemblies

	Craft@Hrs	Unit	Material	Labor	Total
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-11 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 regular gypsum drywall taped and sanded smooth finish, ready for paint					
Using 2" x 4" at	—	MBF	659.00	—	659.00
Using 2" x 6" at	—	MBF	645.00	—	645.00
Using 2" x 8" at	—	MBF	655.00	—	655.00
2" x 4" ceiling joists at 16" on center (.59 BF per SF), with insulation and 1/2" gypsum drywall	B1@.053	SF	1.55	1.78	3.33
2" x 6" ceiling joists at 16" on center (.88 BF per SF), with insulation and 1/2" gypsum drywall	B1@.055	SF	1.83	1.85	3.68
2" x 8" ceiling joists at 16" on center (1.17 BF per SF), with insulation and 1/2" gypsum drywall	B1@.057	SF	2.14	1.92	4.06
For spray applied plaster finish (sometimes called "popcorn" or "cottage cheese" texture)					
Add for ceiling texture	DT@.011	SF	.02	.40	.42
For different type gypsum drywall with taped and sanded smooth finish, ready for paint					
1/2" moisture resistant greenboard, add	—	SP	.10	—	.10
5/8" fire rated board, add	—	SF	.01	—	.01
For different ceiling joist center to center dimensions					
2" x 4" ceiling joists					
12" on center, add	B1@.004	SF	.13	.13	.26
20" on center, deduct	—	SF	-.07	-.06	-.13
24" on center, deduct	—	SF	-.11	-.12	-.23
2" x 6" ceiling joists					
12" on center, add	B1@.006	SF	.17	.20	.37
20" on center, deduct	—	SF	-.10	-.06	-.16
24" on center, deduct	—	SF	-.16	-.11	-.27
2" x 8" ceiling joists					
12" on center, add	B1@.006	SF	.24	.20	.44
20" on center, deduct	—	SF	-.14	-.08	-.22
24" on center, deduct	—	SF	-.22	-.13	-.35
For different type insulation					
Fiberglass batts					
6-1/4" thick R-19, add	—	SF	.26	—	.26
10" thick R-30, add	—	SF	.66	—	.66
Blown-in fiberglass					
8" thick R-19, add	—	SF	.38	—	.38

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

	Craft@Hrs	Unit	Material	Labor	Total
Flat roof assembly 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	789.00	—	789.00
Using 2" x 8" joists at	—	MBF	655.00	—	655.00
Using 1/2" CDX plywood at	—	MSF	648.00	—	648.00
Using 7/16" OSB at	—	MSF	268.00	—	268.00
Flat roof assembly as described above					
Framing, with plywood sheathing	B1@5.00	Sq	262.00	168.00	430.00
Framing, with OSB sheathing	B1@5.00	Sq	223.00	168.00	391.00
Built-up roofing, 3-ply and gravel	R1@2.15	Sq	108.00	77.00	185.00
Conventionally framed roof assemblies 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" CDX plywood.					
Conventionally framed roof assembly. Select roof finish from below					
Framing, with plywood sheathing	B1@4.10	Sq	144.00	138.00	282.00
Framing, with OSB sheathing	B1@4.10	Sq	104.00	138.00	242.00
Add for built-up 3-ply finish roofing	R1@1.25	Sq	99.10	44.80	143.90
Add for composition shingle (Class C) roofing	R1@1.83	Sq	391.00	65.50	456.50
Add for asphalt shingle (Class A) roofing	R1@1.83	Sq	145.00	65.50	210.50
Framing, with no sheathing	B1@2.80	Sq	75.50	94.30	169.80
Add for 26 gauge steel roofing	R1@2.70	Sq	150.00	96.70	246.70
Add for gable studs					
2" x 4" spaced 16" OC (.54 BF per SF)	B1@.023	SF	.36	.77	1.13
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	655.00	—	655.00
2" x 8" (1.40 BF per LF)	B1@.023	LF	.92	.77	1.69
Piecework, Rough Carpentry Rough carpentry on residential tracts is usually done by framing subcontractors who bid at piecwork rates (such as per square foot of floor). The figures below list typical piecwork 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.					
Layout and plating Piecwork 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	—	.27	.27
Larger job, longer runs	—	SF	—	.18	.18
Wall framing Piecwork 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	—	.74	.74
Larger job, 8' high walls, fewer partitions	—	SF	—	.27	.27



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.

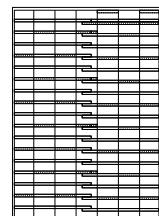
Small or complex job, brace walls and plates	—	SF	—	.24	.24
Larger job, fewer braces, walls only	—	SF	—	.14	.14
Sheathed walls, squared before lifting	—	SF	—	.08	.08

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	—	.21	.21
2" x 10" ceiling or floor joists	—	SF	—	.24	.24
2" x 12" ceiling or floor joists	—	SF	—	.26	.26
2" x 14" ceiling or floor joists	—	SF	—	.30	.30
Add for 12" OC spacing	—	SF	—	.09	.09
Deduct for 20" OC spacing	—	SF	—	-.03	-.03
Deduct for 24" OC spacing	—	SF	—	-.06	-.06

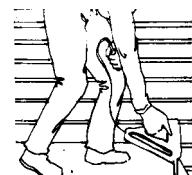


Floor sheathing Piecework rates

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	—	.24	.24
Larger job, longer runs	—	SF	—	.18	.18
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	—	17.40	17.40
Larger job, longer runs	—	Ea	—	13.10	13.10
Add per 3' x 3' landing, including supports	—	Ea	—	44.90	44.90
Add for larger landings, including supports	—	Ea	—	111.00	111.00

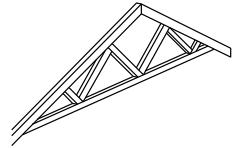
Shear panels Piecework rates

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	—	12.00	12.00
Larger job, few openings, 1st floor	—	Ea	—	7.43	7.43

Roof trusses Piecework rates

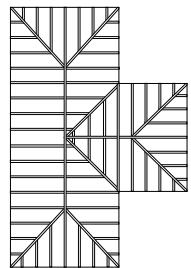
Setting and nailing engineered gable and hip roof trusses 24" OC on prepared wall plates. These figures assume that lifting equipment is provided by the general contractor and that the truss supplier provides a fill package, spreader blocks for each plate and the ridge and jack rafters (if required). 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	—	.65	.65
Larger job, little or no fill or understacking	—	SF	—	.36	.36

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

Rafters 12" OC	—	SF	—	1.34	1.34
Rafters 16" OC	—	SF	—	1.13	1.13
Rafters 20" OC	—	SF	—	.89	.89
Rafters 24" OC	—	SF	—	.65	.65
Larger job, longer runs, nearly all common rafters					
Rafters 12" OC	—	SF	—	.65	.65
Rafters 16" OC	—	SF	—	.58	.58
Rafters 20" OC	—	SF	—	.45	.45
Rafters 24" OC	—	SF	—	.37	.37
Add for slope over 6 in 12	—	SF	—	.22	.22
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	—	2.90	2.90
Larger job, longer runs	—	LF	—	1.66	1.66

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	—	.25	.25
Larger job, longer runs	—	SF	—	.19	.19
Add for slope over 6 in 12	—	SF	—	.12	.12

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	185.00	15.40	200.40
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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	7.93	5.00	12.93
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Pier pads 2" x 6", treated, #2 & Btr

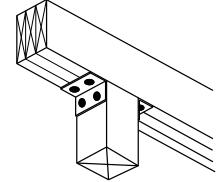
Using #2 & Btr treated lumber at 1.10 BF per LF	—	MBF	1,160.00	—	1,160.00
	B1@.034	LF	1.27	1.14	1.14

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	831.00	—	831.00
Fir, rough Std & Btr, K.D. 4" x 4"	—	LF	1.22	—	1.22
Red cedar, rough green constr.	—	MBF	2,850.00	—	2,850.00
Red cedar, rough green constr.	—	LF	4.19	—	4.19
Redwood, S4S construction heart	—	MBF	2,480.00	—	2,480.00

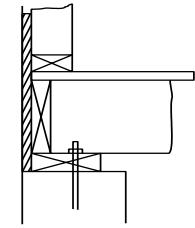
Carpentry, Detailed Breakdown

	Craft@Hrs	Unit	Material	Labor	Total
Redwood, S4S construction heart	—	LF	3.65	—	3.65
Southern yellow pine #2, pressure treated	—	MBF	1,200.00	—	1,200.00
Southern yellow pine #2, pressure treated	—	LF	1.76	—	1.76
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	806.00	—	806.00
4" x 8", 10", 12", per MBF	—	MBF	872.00	—	872.00
6" x 6", per MBF	—	MBF	1,920.00	—	1,920.00
6" x 8", 10", 12", 8" x 8", per MBF	—	MBF	1,920.00	—	1,920.00
4" x 6" (2.15 BF per LF)	B1@.034	LF	1.73	1.14	2.87
4" x 8" (2.85 BF per LF)	B1@.045	LF	2.48	1.52	4.00
4" x 10" (3.58 BF per LF)	B1@.057	LF	3.12	1.92	5.04
4" x 12" (4.28 BF per LF)	B1@.067	LF	3.73	2.26	5.99
6" x 6" (3.21 BF per LF)	B1@.051	LF	6.17	1.72	7.89
6" x 8" (4.28 BF per LF)	B1@.067	LF	8.23	2.26	10.49
6" x 10" (5.35 BF per LF)	B1@.083	LF	10.30	2.79	13.09
6" x 12" (6.42 BF per LF)	B1@.098	LF	12.40	3.30	15.70
8" x 8" (5.71 BF per LF)	B1@.088	LF	11.00	2.96	13.96



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	917.00	—	917.00
2" x 3" (.53 BF per LF)	B1@.020	LF	.48	.67	1.15
2" x 4" (.70 BF per LF)	B1@.023	LF	.71	.77	1.48
2" x 6" (1.05 BF per LF)	B1@.024	LF	.88	.81	1.69
2" x 8" (1.40 BF per LF)	B1@.031	LF	1.25	1.04	2.29



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	645.00	—	645.00
12" centers (1.28 BF per SF)	B1@.021	SF	.83	.71	1.54
16" centers (1.02 BF per SF)	B1@.017	SF	.66	.57	1.23
20" centers (.88 BF per SF)	B1@.014	SF	.57	.47	1.04
24" centers (.73 BF per SF)	B1@.012	SF	.47	.40	.87

2" x 8" Std & Btr

2" x 8" floor joists, per MBF	—	MBF	655.00	—	655.00
12" centers (1.71 BF per SF)	B1@.023	SF	1.12	.77	1.89
16" centers (1.36 BF per SF)	B1@.018	SF	.89	.61	1.50
20" centers (1.17 BF per SF)	B1@.015	SF	.77	.51	1.28
24" centers (1.03 BF per SF)	B1@.013	SF	.67	.44	1.11

2" x 10" Std & Btr

2" x 10" floor joists, per MBF	—	MBF	651.00	—	651.00
12" centers (2.14 BF per SF)	B1@.025	SF	1.39	.84	2.23
16" centers (1.71 BF per SF)	B1@.020	SF	1.11	.67	1.78
20" centers (1.48 BF per SF)	B1@.016	SF	.96	.54	1.50
24" centers (1.30 BF per SF)	B1@.014	SF	.85	.47	1.32

Carpentry, Detailed Breakdown

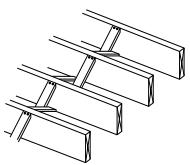
	Craft@Hrs	Unit	Material	Labor	Total
2" x 12" Std & Btr					
2" x 12" floor joists, per MBF	—	MBF	789.00	—	789.00
12" centers (2.56 BF per SF)	B1@.026	SF	2.02	.88	2.90
16" centers (2.05 BF per SF)	B1@.021	SF	1.62	.71	2.33
20" centers (1.77 BF per SF)	B1@.017	SF	1.40	.57	1.97
24" centers (1.56 BF per SF)	B1@.015	SF	1.23	.51	1.74

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.

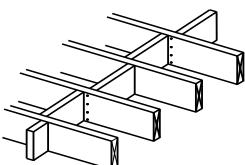
9-1/2" TJI/15	B1@.017	SF	2.73	.57	3.30
11-7/8" TJI/15	B1@.017	SF	3.00	.57	3.57
14" TJI/35	B1@.018	SF	4.37	.61	4.98
16" TJI/35	B1@.018	SF	4.76	.61	5.37

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.

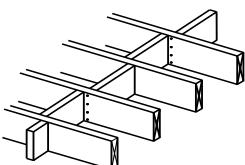
1" x 4" cross					
Joist bridging, per MBF	—	MBF	1,940.00	—	1,940.00
Joists on 12" centers	B1@.034	Ea	.97	1.14	2.11
Joists on 16" centers	B1@.034	Ea	1.32	1.14	2.46
Joists on 20" centers	B1@.034	Ea	1.68	1.14	2.82
Joists on 24" centers	B1@.034	Ea	2.04	1.14	3.18



2" x 6" solid, Std & Btr					
2" x 6" blocking, per MBF	—	MBF	645.00	—	645.00
Joists on 12" centers	B1@.042	Ea	.71	1.41	2.12
Joists on 16" centers	B1@.042	Ea	.95	1.41	2.36
Joists on 20" centers	B1@.042	Ea	1.18	1.41	2.59
Joists on 24" centers	B1@.042	Ea	1.42	1.41	2.83



2" x 8" solid, Std & Btr					
2" x 8" blocking, per MBF	—	MBF	655.00	—	655.00
Joists on 12" centers	B1@.042	Ea	.96	1.41	2.37
Joists on 16" centers	B1@.042	Ea	1.28	1.41	2.69
Joists on 20" centers	B1@.042	Ea	1.60	1.41	3.01
Joists on 24" centers	B1@.042	Ea	1.92	1.41	3.33



2" x 10" solid, Std & Btr					
2" x 10" blocking, per MBF	—	MBF	651.00	—	651.00
Joists on 12" centers	B1@.057	Ea	1.19	1.92	3.11
Joists on 16" centers	B1@.057	Ea	1.59	1.92	3.51
Joists on 20" centers	B1@.057	Ea	1.99	1.92	3.91
Joists on 24" centers	B1@.057	Ea	2.39	1.92	4.31

Index

A

Abbreviations	6
Abrasion testing	314
Abrasive	
anti-skid strip.....	283
concrete finish.....	356
stair treads.....	220, 432
terrazzo	433
ABS	
bungalow fitting	514
bushing	516
cap	516
cleanout adapter	516
cleanout tee	515
closet flange.....	515
coupling	513
double sanitary tee	514
double wye	514
elbow	513
female adapter.....	515
floor drains	516
male adapter	515
P-trap	516
return bend	516
sanitary tee	514
soil pipe adapter	516
test cap	515
test tee	515
trap adapter	516
wye	514
ABS-DWV pipe	512
cleanout plug	516
Absorption testing	314
Accent lights, LED	584
Access	
control units	590
disabled persons	476
fitting, PVC	550
flooring	434
handicapped	476
hatches, sheet metal	266
stairs, folding	284
Access doors	
attic	266
foundation	291
louver	253, 525
plumbing	253, 525
sheet metal	266
steel.....	418
tub	266
wall	266
Access points, wireless....	130, 460
Access ramps	476
Accessories	
glass block	217
water heater	526
Accordion folding doors	443
Accordion folding partitions	443
Acetone	238
Acid cleaning	
concrete	356
etching	466
masonry	371
wash.....	371
Acid etching	437
Acid-proof brick	375
Acid-resistant countertops	473
Acoustical	
adhesive.....	18
block	380
ceiling panels.....	81
design fees	134
engineering	134
partitions	443
privacy testing	134
tile, demolition.....	100, 336

ACQ-compatible flashing	268, 270
ACQ-treated lumber	201
Acrovyn wall cover	444
Acrylic	
diffusers	583
latex caulk	77
tub and shower	533
waterproofing	184
Acrylic-urethane foam roof	402
Actuating devices,	
garage doors	164
ACZA treatment, lumber	206
ADA	
handicapped access	476
signage	442
Adapters	
ABS cleanout	516
ABS female	515
ABS male	515
ABS soil pipe	516
ABS trap	516
copper	504
CPVC	508
drain pipe	126
DWV trap	512
polyethylene pipe	621
Additives	
coloring	85, 218, 350, 356
concrete	85, 350, 356
Add-on boiler modules	578
Address systems, public	592
Adhesives	17
acoustical ceiling tile	429
ceramic tile	18, 428
flooring	18, 154, 159
modified bitumen	258
permanent bond	258
roofing	256, 258
tile	288, 289
wallpaper	293
wood flooring	159
Administrative overhead	208
Admixtures	
coloring	85, 218, 356
concrete	85, 350, 356
Adobe block	216
Aerators, rental	327
Aerial	
equipment rental	324
mapping	313
photographs	313
platform rental	324
Aggregate	18, 94
base	84
exposed, concrete	615
finish	356
paving	609
roofing	256
seeded	244
testing	314
Air compressor	
rental	139, 320
service station	449
Air conditioning	180
heat pump	178
residential	180
window	177
wiring	128
Air curtain heaters	536
Air curtains	417
Air eliminator vent	538
Air eliminator-purger	173
Air exhausters	
exhaust hood	455
fans	142, 407
Air filter system, central	176
Air hammer	596
Air handler, residential	179
Air hose	
reel	449
rental	320
Air tool operator wage	309
Air tools	
earthwork	138
pneumatic	103
rental	320
Airless paint sprayer	239
Air-supported enclosure	481
Alarm	
access	434
circuit	542
systems	589, 591
systems, electrical work	128
valves	492
wiring	128, 264
Alarms	
fire	264
security	264
smoke	264
Alcohol paint thinner	238
Aliphatic resin glue	18
All-season storm doors	114
Altars	462
Aluminum	
breaks, rental	329
cladding	400
coating	257
concrete-imbedded	482
conduit	552
cupola roof	97
curtain wall	419
downspouts	404
fence	149
flagpoles	448
flashing	267, 403
foil insulation	183
gutters	404
letters	441
louvers	80
metal work	388
ornamental	388
oxide	356
patio doors	121
pet doors	122
railing	386
roofing	401
sheet	403
siding	276, 401
stairs	282
tile	429
vents	406
Americans with Disabilities (ADA access)	476
Ammeter	571
Ammonium sulfate	623
Anchor bolts	58
foundation	159, 361
templates	340
tilt-up	361, 363
Anchors	
chimney	151
concrete	159
conduit hanger	554
embedded steel	373
foundation	58
masonry	372, 556
timber connectors	159
Andersen	121
Andersen windows	120
Angle	
bracket	516
clips	159
flashing	268
iron	219
iron, fireplace	151
sill, steel	387
stops	522
supports, pipe	517
valves	522
Annunciator panel	591
Anodizing	387
Antenna	
cable	130
remote high gain	130
Anti-siphon vacuum breakers	173
Anti-skid strips	283
Appliance dolly, rental	329
Appliances	
cabinets	31
connections	252
dishwashers	248
garbage disposers	248
ranges	255
rough-in	252
solar water heaters	249
water heaters	249
water softeners	250
wiring	128
Appraisal fees	18
Apprentice costs included	3
Apron	
concrete driveway	615
window	53
Arbitration fees	19
Arched mobile	20
Archaid	188
Archbead	188, 426
Architectural drawings	20, 126
form lining	341
screens	388, 406
shingles	258
signage	441
Area lighting	588
Area modification factors	12–15
how to use	4
Area walls, sheet metal	267
Arks, church	460
Armed guard	265
Armstrong ceiling tile	429
flooring	153, 154, 431
Arquati Roma awnings	471
Arrow board, rental	326
Art glass, ecclesiastical	470
Asbestos	
containment	338
pipe insulation removal	338
removal	338
testing	26
Asbestos worker, wage	309
As-built drawings	126
Ash	
drop	151
dumps	151
flooring	155
urns	473
Ash wood flooring	155, 158
Ashtray	473
Asphalt	
access road	610
built-up roofing	256

coatings	256	Awnings	21	column	387	Beadex	169
cold milling	611	canopy-type	472	course, paving	243	Beam clamps, piping	517
curb	610	commercial	471	floor	154	Beams	
dampproofing	382, 397	fabric	21	hardwood	222	applied	54
emulsion	381	lean-to type	471	marble	381	carpentry	390
felt	27, 401	motorized	471	MDF	226	ceiling	45
milling	611	security	21	post	162	clamps, conduit	554
mix	82			resilient flooring	154	collar	48
paper	258			screed	188, 426	concrete	339, 345
parking lot	610			sheet, fiberglass	257, 258	formwork	339, 345
paving	243, 609			slab	94	grade	93
paving, demolition	102	Baby changing stations	447	Base wages		laminated timbers	396
primer	466	Backbar	457	industrial & commercial	309	log	193
recycling	332	Backboard, plywood	460	residential	10	lumber	201
repair	611	Backboards, basketball	465	Baseball backstops	618	LVL	396
roll sheathing	27	Backer board		Baseboard	55	precast	359
roof coating	237	gypsum drywall	168	bamboo	157	ridge	193
roofing	257	tile	290	MDF	226	shoring	345
sawing	371	Backer rod	612	Baseboard heating		steel	383
sheathing	182	Backer strip, steel framing	69	electric	536	steel collar	72
slurry seal	611	Backfill		radiation	537	Bearing capacity test	279
speed bumps	610	concrete excavation	339	radiators	175	Bearing ratio, soil testing	317
tack coat	610	earthwork	136	Basement		Bed bumpers	444
walks	615	tilt-up	361	doors	23	Bed molding	224, 226
waterproofing	382, 397	trench	598, 619	stairs	281	Beds, concealed	25
Asphalt cutters, rental	320	Backflow		storm window	304	Beehive climber	467
Asphalt-fiberglass shingles	258	preventers	522, 619, 627	Basic wage cost	3	Beehive grate	636
Asphaltic concrete testing	315	valves	312	Basketball, backboards	465	Bell footings	609
Assemblies		Backhoes		Basketweave fence	147	Bell wire	105
brick wall	209, 373	excavation	137, 599	Bath accessories	445	Bell wiring, electrical work	128
ceiling	36	rental	138, 322	ceramic	288	Bells	
floor	33	trenching	597	ceramic tile	289	door	105
floor slab	352	Backing		compartments	442, 533	fire alarm	591
framing, door opening	43	carpentry	47	enclosures	272	Belt conveyors	491
framing, window openings	44, 66	clay tile	374	fans	142	Benches	
interior walls	34	finish carpentry	51	shower cabinets	533	athletic	466
plumbing	530, 532	rods	411	shower doors	271	bus stop	479
ramps, landings,		steel framing	69	vanities	290	church	460
for handicapped	476	Backsplash	96	Bath exhaust fan	139, 140	locker room	474
roof	36	Backstops		accessories	141	park	474
roofing	37	basketball	464	ceiling blower	139	stadium	474
steel framing, door opening	65	Backstops, baseball	618	Exhaust Air	140	Benderboard	187
steel framing, window opening	66	Baggage inspection	487	Heat-A-Lamp	141	Benefits, fringe	309
wall	34	Balance bar	465	heater, ceiling	141	Bentonite	
wall, brick	209, 373	Balance beams	467	QuieTTest	140	granules	355
Astragal molding		Balancing valves	173, 539	switch	141	waterproofing	294
108, 223, 413, 421		Ball cleaning sewer mains	630	timer switch	141	Bevel siding	199
Astro dial time switch	564	Ball valves	522	ValueTest	140	Beveled glass doors	107
Athletic		Ballista range hood	254	vent kit	141	Beverage dispenser	458
benches	466	Balusters		with heater	141	Bicycle racks	475
court, striping	467	painting	240, 438	with heater, infrared	140	Bidets	247
court, surface prep	466	stair	56	with light	140	Bi-fold doors	124, 125
equipment	465	Bamboo		Bath fixtures	531, 533	hardware	125
equipment, swimming pools	475	baseboard	157	Bathroom		mirrored	125
field marker	218	flooring	157	accessories	23	Bike post bollard	475
fields	465	stair nose	158	cabinets	290	Bin, trash	332
gym equipment	464	threshold	158	fan wiring	128	Birch	
ATM machine	453	Band molding	222	fans	139, 140, 141	doors	115, 116
Attachments, crane, rental	322	Band saws, rental	328	sinks	247, 533	paneling	242
Attic		Bank equipment	452	vanities	290	plywood	203
access doors	266	Bar		wallboard	168	Bird screen	406
fans	128	doors	118	Baths, steam	285	Birdstop	262
fans, belt drive	141	sinks	247	Bathtubs	245, 531, 533	Bitumen adhesive, modified	258
gable vents	142	Barbed wire fence	144	ADA compliant	246	Bituminous	
stairs, folding	284	Barracks, manufactured	480	caulk	78	paving	243, 611
vents	291	Barricade		doors	271	paving, removal	332
Audio		highway	615	enameled cast iron	245	roofing	256, 401
detectors	264	lights	22	enameled steel	245	Black steel pipe	494
sensors	589	rental	22	fiberglass	245	Blanket insulation	183
Audio-visual equipment		roadway	22	recessed	245	Blasting	
school	458	temporary enclosures	331	rough-in	531	excavation	595
Auditorium		Barrier posts	452	seat	25	sand	371
acoustic design fees	134	Barrier tapes	318	walk-in	246	water	239, 263, 333, 371, 437
seating	474	Barrier, egress	487	whirlpool tub	245	Bleachers	464, 474
Auger holes		Bars		Battens, lumber	222	Blinds	
caissons	608	bath accessories	24	Batterboards	189	roll-up	296
post holes	617	masonry	346, 372	Batts, insulation	181, 398	Venetian	296
Augers		reinforcing steel	89, 346	Bay vent channel	292	vertical	296
rental	327	welding	348	Bay window	299	Block	
toilet, rental	328	Base		roof cover	304	adobe	216
Auto hoist	450	asphalt	243	lath	426	concrete	213, 378
Automatic gates	165	ceramic tile	290, 374, 428	lath & plaster	188	core fill	213, 378
Awning windows				molding	223, 226		
aluminum	302						
vinyl-clad wood	300						

<p>demolition 335 detailed concrete 213, 378 filler, acrylic 237 flooring 158 glass building 217 masonry 213, 378 painting 240, 438 pier 39 sawing 370 walls, concrete 213 Block filler, painting 438 Blocking carpentry 389 finish carpentry 51 fireblocks 45 sheathing 392 steel floor joists 61 Blockout forms cast-in-place slabs 341 tilt-up 361 Blockouts, concrete 342 Blood storage refrigerators 469 Blowers exhaust hood 455 fans 142 fireplace 152 heating 535 Blown-in insulation 183, 398 Blue Board insulation 181 Bluegrass seeding 624 Blueprinting 25 Board insulation 181 marker 440 sheathing 50, 51 Boards forming 88 lumber 194, 196-198 sheathing 61 treatment 206 Board-up window 274 Bobcats, rental 323 Boilermaker, wage 309 Boilers 578 expansion tank 173 foundations 366 modules 578 Bollards bicycle 475 cast iron 616 granite 616 Bolt cutters, rental 328 Bolts anchor 58 carriage 232 foundation 159 lag 232 machine 232 tilt-up 361 Bond breaker 355 tilt-up 363 Bonding agents adhesives 17, 18 flooring 154 roofing 256, 402 Bonds, insurance 185 Bookcases, painting 241 Boomlifts, rental 324 Boring caissons 608 soil testing 279 under walkways 619 Bottom plates, carpentry 37 Bottom track, steel framing 73 Bow windows 304 Box nails 227 Boxes electrical 561 junction 563 outlet 128, 561 pull 562 </p> <p>switch 128 valve 619 Boxing ring 465 Braces tilt-up 363 trench, rental 323 wall 164 Bracing bulkheads 605 carpentry 44, 390 steel framing 67 temporary 44, 67 trenches 605 trenches, rental 323 Brads, nails 229 Braille signage 442 elevator 479 Branch circuits 573 Brass fabrications 388 railing 386 stormdoors 114 Bread slicer 456 Breaker bond 355 circuit 128 form 355 panels 571, 572 paving, rental 320 vacuum 312, 618 Breaking, demolition 104, 334 Brewer, coffee 458 Brick acid-proof 375 artificial 243 chemical-resistant 375 cleaning 371 Colonial 209 commercial 210 common 374 cutting 370 demolition 100 face brick 374 firebrick 212 flooring 220 jumbo 210 manhole 637 masonry 209, 374 mini 211 mission 212 modular 209, 210 mold flashing 268 molding 108, 222 mortar 209 Norman 209, 210 Padre 210 painting 240 paving 215, 243, 382, 612 plate 382 pointing 371 sandblasting 263 sawing 370 standard 209, 210 steps 382 testing 316 veneer 211 walls 209, 373 Bricklayer, wage industrial & commercial 309 residential 10 Bricklayer's helper, wage, residential 10 Bridge, pedestrian 487 Bridging carpentry 41 I-Joist 160 joist 159, 390 steel floor joists 61 tension 159 Bron Manufacuring 140, 141, 255 Broiler, food 455 Bronze fabrications 388 Broom finish, concrete 95, 356 Brown coat plaster 244, 427 chippers, rental 327 cutters, rental 327 hogs, rental 327 removal 137, 594 Brush finish, concrete 95 Brush painting 436 Bucket, clamshell, rental 322 Buckets, rental 321 Buggies, rental 321 Builder's adhesive 17 Builder's hardware rough carpentry 159 Building appraisal 18 blocks, concrete filled 87 board 293, 398 columns 186 demolition 103, 334 moving 338 paper 27, 28 permit fees 28 posts, steel 186 sewer 266 stone, testing 316 wiring 127 Building laborer, wage industrial & commercial 309 residential 10 Building layout 595 Buildings steel engineered 483 temporary, rental 330 Built-in ovens 255 Built-up girders carpentry 40 steel 383 Built-up roofing 256, 401 cement, Cold-Ap 258 demolition 102 Bulb, light 192 Bulkhead forms 340, 342 Bulkheads, shoring 605 Bulldozers excavation 137 rental 138 Bullet resistant glass 422 Bulletin boards 441 Bullnose drywall 169 paver 212 Bumper guards 444 Bumper threshold 285 Bumpers dock 365 highway 615 Bumps, speed 610, 617 Bungalow fittings, ABS 514 Burlap soil stabilization 603 Bus duct connection 571 Bus schedule, display panel 480 Bus stop enclosures 479 shelters 479 Bushings ABS 516 conduit 543 Business overhead 208 Butacite 482 Butt hinges 420 Button board 187 Button switches 565 Buttweld joints, welding 389 Butyl roofing 402 BX cable 560 Bypass doors 123 accessories 124 beveled mirror 123 mirrored 123, 124 Cabinets bath 220, 290, 446 classroom 473 cleaning 83 custom 472 end panels 31 extinguisher 493 finish carpentry 473 fire hose 493 hardware 420, 472 hospital 473 installation 55 kitchen 29 labor cost 31 laboratory 473 lavatory 290 lighting fixtures 191, 221 linen, shelving 270 medicine 220, 290, 446 metal 472 painting 241 shelving 270 shop 472 shower 533 storage 473 utility 30, 31 vanity 290 wardrobe 458, 472, 473 wood 473 Cable antenna 130 armored 560 BX 560 Cat 5 593 Cat 5e 593 Cat 6 593 coaxial 592 communication 591 computer network 593 electrical 561 Ethernet 593 fiber optic 592 flexible armored 560 ice melting 561 metal-clad 560 network 130, 459, 460 phone 591 power 560 punch down 460 RG Series 592 RJ Series 592 Romex 127, 542, 559 signal 592 snow-melting 476, 561 tap 591 testing, computer 594 tray 557 twinaxial 593 twisted pair 593 Cable panel 130 Cable testing 130, 460 Cabs, elevator 133, 490 Café doors 118 Caissons 608 Calcimine removal 439 Calcium chloride 85, 350 Calcium nitrate 623 California B.A.C.T. 579 California Code 2010 579, 581 California pavers 212 Cambrria countertop 96 Campus network wiring 459 Cane fiber joint 355 Canopy commercial 471 door 21 food service hoods 455 range hoods 253 steel framing 387 Canopy lights 587 </p>

Cant strips	50	Church	134																																																																																																																																																																																																																																																								
carpentry	50	acoustical design fees	134																																																																																																																																																																																																																																																								
roofing	182, 403	chairs	461																																																																																																																																																																																																																																																								
Canvas tarpaulins	285	equipment	460																																																																																																																																																																																																																																																								
Cap		glass	470																																																																																																																																																																																																																																																								
conduit	544	pews	461																																																																																																																																																																																																																																																								
door bottom	286	Chutes	337																																																																																																																																																																																																																																																								
sheet, roofing	257	demolition	337																																																																																																																																																																																																																																																								
test	515	garbage	491																																																																																																																																																																																																																																																								
tile	374	linen	491																																																																																																																																																																																																																																																								
Capillary fill	339	mail	447																																																																																																																																																																																																																																																								
Capital forms	343	trash	337																																																																																																																																																																																																																																																								
Caps		Cigarette disposal	473																																																																																																																																																																																																																																																								
ABS	516	Cinder rock	604																																																																																																																																																																																																																																																								
black steel	494	Circleline lighting	191																																																																																																																																																																																																																																																								
copper	504	Circuit balancing valves	173, 539																																																																																																																																																																																																																																																								
CPVC	507	Circuit breakers	575																																																																																																																																																																																																																																																								
drain pipe	126	panels	575																																																																																																																																																																																																																																																								
flashing	403	wiring for	128																																																																																																																																																																																																																																																								
masonry	213, 216	Circuits																																																																																																																																																																																																																																																									
molding	222	dryer	543	post	163	exit light	542	Capuccino dispenser	458	light and power	542	Carbon steel pipe	494	motor	566	Carborundum rub	95, 356	range	543	Card reader		receptacle	542	parking	450	switch	542	security access	590	under slab	542	Carpenter, wage		Circular louver	292	industrial & commercial	309	Circular windows	299	residential	10	City cost adjustments	12-15	Carpentry		Civil engineering fees	134	assemblies	37	Cladding, preformed	401	cabinets	29, 473	Clamps		finish	51, 52	column forms	355	furring	52	concrete, rental	322	industrial and commercial	389	conduit	555	molding	226	ground rod	566	piecework	37	pipe	517, 518	piecework rates	39, 74	PVC conduit	551	plates	390	riser	517	rough	46	top beam	517	square foot costs	32	Clamshell excavators, rental	322	wall sheathing	394	Clamshovels, rental	327	Carpet adhesive	18	Classrooms, manufactured	480	Carpet tile	434	Clay		Carpets	433	backing tile	374	access flooring	434	brick	373	mats	220, 474	pipe	635	subcontract	76	tile, load bearing	374	Carports	77	Clay tile roofing		Carriage bolts	232	demolition	102	Carriers, conveyors	491	Clean metal primer	236	Cars, elevator	133, 490	Cleaning		Cartridge fuses	575	brick	371	Carved doors	107	cabinets	83	Casement windows		concrete	356	vinyl	299	doors	83	vinyl-clad wood	300, 301	final	83	Cases		floors	83	cabinets	29, 473	glass	83, 331	laboratory	473	glass block	381	painting	241	masonry	371, 372	Cash box, service station	450	new construction	83, 331	Cash dispenser	453	paint preparation	239	Cashier booth, bulletproof	485	painting	436	Casing		pavement joints	612	aluminum siding	276	plumbing fixtures	83	beads	188	sewer main	630	door	53, 108	shower stalls	83	extruded polymer	226	stone	371	finish carpentry	52	storm sewer	631	hardwood	222	terra cotta	371	MDF	226	vacuum systems	290	molding	223	walls	83	nails	229	windows	83	window	54	Cleaning station	457	Cast iron		Cleanout		column bases	387	adapter, ABS	516	fittings	626	doors, fireplace	151	flanged pipe	626	drainage piping	525	ornamental iron	150	plug, ABS-DWV	516			tees, ABS	515
dryer	543																																																																																																																																																																																																																																																										
post	163	exit light	542	Capuccino dispenser	458	light and power	542	Carbon steel pipe	494	motor	566	Carborundum rub	95, 356	range	543	Card reader		receptacle	542	parking	450	switch	542	security access	590	under slab	542	Carpenter, wage		Circular louver	292	industrial & commercial	309	Circular windows	299	residential	10	City cost adjustments	12-15	Carpentry		Civil engineering fees	134	assemblies	37	Cladding, preformed	401	cabinets	29, 473	Clamps		finish	51, 52	column forms	355	furring	52	concrete, rental	322	industrial and commercial	389	conduit	555	molding	226	ground rod	566	piecework	37	pipe	517, 518	piecework rates	39, 74	PVC conduit	551	plates	390	riser	517	rough	46	top beam	517	square foot costs	32	Clamshell excavators, rental	322	wall sheathing	394	Clamshovels, rental	327	Carpet adhesive	18	Classrooms, manufactured	480	Carpet tile	434	Clay		Carpets	433	backing tile	374	access flooring	434	brick	373	mats	220, 474	pipe	635	subcontract	76	tile, load bearing	374	Carports	77	Clay tile roofing		Carriage bolts	232	demolition	102	Carriers, conveyors	491	Clean metal primer	236	Cars, elevator	133, 490	Cleaning		Cartridge fuses	575	brick	371	Carved doors	107	cabinets	83	Casement windows		concrete	356	vinyl	299	doors	83	vinyl-clad wood	300, 301	final	83	Cases		floors	83	cabinets	29, 473	glass	83, 331	laboratory	473	glass block	381	painting	241	masonry	371, 372	Cash box, service station	450	new construction	83, 331	Cash dispenser	453	paint preparation	239	Cashier booth, bulletproof	485	painting	436	Casing		pavement joints	612	aluminum siding	276	plumbing fixtures	83	beads	188	sewer main	630	door	53, 108	shower stalls	83	extruded polymer	226	stone	371	finish carpentry	52	storm sewer	631	hardwood	222	terra cotta	371	MDF	226	vacuum systems	290	molding	223	walls	83	nails	229	windows	83	window	54	Cleaning station	457	Cast iron		Cleanout		column bases	387	adapter, ABS	516	fittings	626	doors, fireplace	151	flanged pipe	626	drainage piping	525	ornamental iron	150	plug, ABS-DWV	516			tees, ABS	515				
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Cleanup, overhead.....	310	clamps, rental.....	322	equipment rental.....	321	slip-formed.....	353
Clear cedar siding.....	199	colonial.....	134	etching.....	357	snap ties.....	86
Clearing		concrete.....	340	excavation.....	338	specialty finishes.....	95
brush.....	594	fireproofing.....	409	expansion joints.....	85, 355	spread footings.....	377
excavation.....	136	footings.....	94	exposed aggregate.....	95	stain.....	235
Clerical help cost.....	310	lally.....	39	fiber mesh reinforcing.....	85	stairs.....	354
Clevis hangers.....	517	lally, steel.....	57	fill.....	365	stamped finish.....	96
Climber, tower.....	469	marble.....	381	fill, columns.....	384	stamped, subcontract.....	369
Clips		painting.....	240	finishes.....	95	steps.....	95, 351, 354
angle.....	159	porch.....	84	finishing.....	96	steps-on-grade.....	95
framing.....	159	precast.....	359	fireproofing.....	407	structural.....	351, 353
plywood.....	162	reinforcing.....	349	flared apron.....	476, 615	support poles.....	360
Clock		structural steel.....	384	flatwork.....	352, 611	surface prep.....	437
receptacles.....	563	tilt-up.....	365	floor finishes.....	356, 369	surfacing.....	369
wiring.....	128	tube.....	354	floor slab.....	352	suspended slabs.....	353
Closers, door.....	105, 420	wood.....	84	footings.....	94	testing.....	315
Closet doors.....	119	Come-a-longs, rental.....	329	footings, demolition.....	100	ties.....	86
bi-fold.....	124	Commercial brick.....	210	form stakes.....	86	tile.....	261
bypass.....	123	Commercial wage rates.....	309	form stripping.....	88	tile roofing.....	261
mirrored bypass.....	123, 124	Common brick.....	374	form tie.....	355	tilt-up.....	362
Closet flange, ABS.....	515	Communications.....	589	forms.....	86, 87, 88, 93, 339	topping.....	95
Closets		Communications cable.....	591	forms, cast-in-place.....	340	underpinning.....	605
cabinets.....	29, 473	Communication rail.....	461	forms, paving.....	611	unit masonry.....	213
lighting, wiring.....	128	Compacting soil		foundations.....	93	vapor barrier.....	430
lining, cedar.....	79	embankment.....	597	grade beams.....	93	vibrators, rental.....	321
poles.....	55	equipment rental.....	139, 321	granite aggregate.....	85	walks.....	94, 615
racks.....	453	excavation.....	136, 597	grout.....	355, 378	wall form.....	88
shelves.....	270	roadway.....	603	grout mix.....	85	wall sawing.....	370
storage unit.....	55	trenches.....	599	grouting.....	96	walls.....	86, 87, 92, 351, 357
water.....	247, 530, 532	Compaction testing.....	279	gunite.....	357	waterproofing.....	294, 355, 397
Clothes chutes.....	491	Compactors, rental.....	139, 321	hardeners.....	356	waterstop.....	91, 349
Clothes dryers		Compartments, cubicles.....	442	headwalls.....	638	wedge tie.....	355
vent sets.....	291	Composite		high early strength.....	85	work.....	338
wiring.....	128	doors.....	119	ICF.....	86		
Clothes washers, wiring.....	128	Composite lumber.....	98	inserts.....	355		
Clothesline units.....	84	Composition		insulated forms.....	86, 87		
Coat hooks and racks.....	453	roof, coating for.....	237	insulating deck.....	369		
Coatings		roofing.....	258	joints.....	85		
cementious.....	369	Compressors		keyway.....	93		
concrete finishes.....	356	foundations.....	366	labor placing.....	351		
deck.....	437	paint.....	239	landings.....	476		
industrial.....	436	rental.....	320	lightweight.....	85		
roofing.....	256	service station.....	449	fine markings.....	616		
steel.....	387	Computer		lintels.....	382		
Coaxial cable.....	592	access flooring.....	434	manholes.....	636		
Code caps.....	291	network cable.....	592, 593	masonry units.....	213, 378		
Coffee brewer/percolator.....	458	network setup.....	130, 131	meter boxes.....	221		
Coil		wiring.....	130	mix.....	84		
framing nails.....	229	Concrete		mixer, rental.....	321		
roofing nails.....	230	84, 338, 350		nails.....	230		
Cold box, insulation.....	399	access ramps.....	476	paint preparation.....	239		
Cold milling, asphalt.....	611	additives.....	85, 350, 355, 356	paint removal.....	234		
Cold process cement.....	258	adhesive.....	18	painting.....	240, 437		
Cold-formed steel framing.....	56	aggregate.....	350	patching.....	95		
Collar beams		apron.....	476, 615	pavers.....	215, 613		
carpentry.....	48	architectural.....	85	paving.....	244, 611		
steel framing.....	72	beams.....	339, 345	paving, removal.....	332		
Collar ties.....	48	block core fill.....	213, 378	piles.....	606		
Collated brads.....	229	buggies, rental.....	321	pipe.....	633		
Collated nails.....	229, 230	building walls.....	351	placing.....	95, 351		
Colonial		bush hammered.....	356	plank.....	358		
brick.....	209	caisson.....	608	plasticized.....	85		
columns.....	84	cast-in-place.....	354	plyform.....	203		
entrances.....	134	coatings.....	355, 356, 369	pouring.....	95		
interior doors.....	119	coloring.....	85, 96, 218, 356, 357	precast.....	221, 357		
storm doors.....	114	column forms.....	340	pull & junction box.....	542		
Color coat, tennis court.....	466	columns, reinforcing.....	349	pump mix.....	85		
Coloring agents.....	218	conduit envelopes.....	541	pumping.....	350		
concrete.....	85, 95, 350, 357	core drilling.....	370	ready-mix.....	84, 350, 351		
mortar.....	218, 613	culvert, precast.....	633	recycling.....	332		
Column forms.....	342	curb.....	88, 95, 614	reinforcement.....	89, 346		
capitals.....	344	curing.....	356	retaining walls.....	92, 341		
round.....	344	curing compounds.....	351	roof decks.....	369		
tilt-up.....	365	curing papers.....	28	sandblasting.....	263		
Columns		cutting.....	370	sawing.....	362, 370		
base ties.....	160	decking.....	369	saws, rental.....	321		
bases.....	84	delivery charges.....	85	screeds, rental.....	322		
capitals, formwork.....	344	demolition.....	101	sealant.....	77		
caps.....	160	depression forms.....	341	sealer.....	356		
carpentry.....	39	driveways.....	84	shingles.....	261		
carpentry, steel.....	57	edge forms.....	340	sidewalk.....	94, 615		
		embossed finish.....	96	slab demolition.....	336		
		equipment foundations.....	366	slab forms.....	340		
				slab sawing.....	370		
				slabs.....	94, 352, 354, 359, 369		

straps	566	Cork	hydraulic, truck, rental	319	Cut and fill excavation.....	603		
wood	159	insulation.....	399	jib	491	Cutting		
Conservatories	481	running track.....	465	asphalt	371	asphalt	371	
Construction		sheathing	435	boards	454	boards	454	
barricades	22	Corner	tower, rental	319	brick	370		
camps, manufactured.....	480	bead	188, 223, 426	truck-mounted, rental.....	319	concrete	370	
economics	307	cabinets	31	Crawl hole vents.....	291	masonry	370	
elevators and hoists.....	319	guards, metal	387, 404	Crawler dozers, rental	323	slabs	370	
keying.....	170	mold	223	Crawler tractors.....	137, 596, 601	steel.....	388	
loans	311	molding	222	Credits and acknowledgments...16		walls	370	
photographs	318	record (surveying)	313	Creosote	206	Cypress flooring	156	
signs	318	Cornice molding.....	54	Crew codes	10	D		
tools, rental	320	Cornices, painting	240	Crew composition	10	Dampers, air regulating,		
Consultants' fees	134, 313	Corrugated	Cribbing and shoring	605	fireplace	151		
Contact cement.....	18	fiberglass.....	150	Critical path scheduling	311	Damproofing	397	
Containers, storage, rental.....	331	glass.....	422	Croll-Reynolds	579, 581	Danger signs	318	
Containment, asbestos	338	mats	220	Cross arms pole	577	Danish oil stain	237	
Contingency	208, 310	metal pipe	634	Cross bridging	41, 159	Deadbolt locks		
Continuous spread footings	377	metal roofing	260, 401	steel floor joists	61	commercial	420, 421	
Contractor insurance.....	185	metal siding	276, 401	Crossing signal	486	residential.....	170	
Contractor's labor burden		pipe	634	Cross-linked poly pipe	509	Debris removal	310, 331, 337	
industrial & commercial	309	polycarbonate	150	Crown molding		Deck		
residential.....	10	polyethylene pipe	634	cabinets	31	painting	438	
Control		polyethylene tubing	631	hardwood	222	Decking		
erosion	624	Cost adjusting, labor	4	labor	54	redwood	98	
fund fee	311	Cost adjustments, city	12-15	MDF	226	Decks	98	
joints	373	Cost engineering	313	pine	224	cementitious	369	
pests (soil treatment)	280	Costs listed in this book	4	special cutting	224	composite lumber	98	
valves	523, 618	Cotton insulation	183	vinyl	226	concrete	369	
Control panels		Cotton mat reinforcing	257	Crushed rock	18, 126	covers	99	
alarm	591	Counter-flashing	268, 403	CSI		diagonal pattern	98	
motor	566	Counters, bank	452	Division 01	310	fiber plank	369	
Control switch, fan	141	Countertop	crystelite	96	Division 02	332	finish room	99
Controls		Countertop steamers	454	Division 03	338	flashing	268, 270	
hydronic	172	Countertops	cleaning	83	Division 04	371	flashing, Vycor	27
irrigation	618	Corian	97	Division 05	383	footings	100	
motor	566	engineered stone	96	Division 06	389	handrail	99	
sprinkling	620	granite	96	Division 07	397	metal	384	
Convertible range hood	254	labor costs	96	Division 08	412	metal, demolition	336	
Conveying equipment	488	laminated plastic	96	Division 09	423	nails	228	
Conveyors		plastic	473	Division 10	440	painting	437	
belt	491	tile	290, 433	Division 11	449	pine	98	
checkroom	453	Couplings	Court, athletic, surface primer	466	Division 12	470	posts	99
concrete, rental	322	ABS	513	Division 13	475	pressure treated	98	
oven	456	black steel	494	Division 14	488	railing	99	
Cooking equipment	453	copper	504	Division 21	491	redwood	98	
Cooktops, residential	255	CPVC	507	Division 22	494	roof	50, 99, 384, 385	
Coolers	457	drain pipe	126	Division 23	535	stain	236	
drinking water	534	threaded	543	Division 26	541	stairs	99	
HVAC	180	Court, athletic, surface primer	466	Division 27	589	waterproofing	294	
walk-in	457	Cove base	154	Division 31	594	yard and patio	100	
Cooling		Cove molding	222, 224	Division 32	609	Decontamination		
air conditioning	180	MDF	226	Division 33	626	lead-based paint	233, 435	
heat pump	178, 179	Cover	Cubicles	442	PCBs	435		
Coping		plywood	274	Culvert pipe	631, 633	radioactivity	435	
masonry	216, 382	Cover plate, electric	565	Cup holder	23	toxic chemicals	435	
metal	403	Cover, swimming pool	476	Cupolas		Decora glass block	217	
Co-polymer shutters	272	Coverage loss defined	3	weather vanes	97	Decorative glass, ecclesiastical	470	
Copper		Coverings	Door	273	Cupolas	97	Dehumidifiers, rental	329
flashing	267	door	273	Curb inlet protection	604	Deli case, food service	454	
grounding devices	565	window	273	Curbing machine rental	325	Delivery expense defined	3	
gutter	405	Covers	canvas	285	Curbs		Delivery, office trailers	330
nails	267	joint	412	asphalt	610	Deluge valves	492	
pipe	503	manhole	637	concrete	88, 95, 614	Demobilization	314	
pipe, DWV	512	plastic	253, 285	demolition	101, 332	Demolition	100, 334	
pressure fittings	504	CPM scheduling	134, 311	elevated slabs	345	asbestos	338	
roof, cupola	97	CPVC	adapter fittings	508	for handicapped	478	asphalt	102
roofing	404		brass fittings	508	granite	614	building	104, 334
tubing	505, 512		pipe	507, 508	inlets	637	ceiling	100
wall ties	372		snap-on tubing strap	508	Curing concrete	356, 362	concrete	100
window roofs	304		transition fittings	508	Curing papers	28	concrete block	100
wire, THHN	558	Craft codes	7, 10	Curtain rods		curb	101, 477	
wire, XHHW	559	Craft hours defined	3	drapery hardware	127	doors	101	
wood preservative	237	Craft@Hrs column	10	shower	24	fence	333	
Corbels, cabinet	31	Cranes	concrete placing	351	Curtain wall	419	guardrail	333
Cord sets	563		hoists	490	Curtains		joists	103
Core				industrial and commercial	471	manholes	333	
brick testing	316			lift equipment	463	masonry	100	
cutting, concrete	370			residential	127	plumbing fixtures	478	
grouting	213, 378			stage	462			
sampling (soil testing)	279							

roof.....	336	Ditch Witch	598	trim	222	service.....	416																																																																																																																																																																																																																												
roofing.....	102	Ditching	136, 597	twin door portal.....	485	shower.....	271																																																																																																																																																																																																																												
sheathing and siding	102	Ditra membrane	94	weatherstripping	294, 421	sliding glass.....	417																																																																																																																																																																																																																												
stairs.....	103	Divider strips, terrazzo	433	Door stops molding	108	sliding, fire.....	415																																																																																																																																																																																																																												
subcontract.....	104	Dividers		Door trim	108	sliding, metal.....	444																																																																																																																																																																																																																												
toilet partitions.....	478	partition.....	443	Doorbell, wiring	105	solid core	106																																																																																																																																																																																																																												
walls	103, 335	redwood	615	Doors		steel.....	415																																																																																																																																																																																																																												
windows	103	Docks, loading	354	access.....	253, 266, 418, 525	steel exterior.....	106																																																																																																																																																																																																																												
wood framing.....	103, 104	bumpers	365	accordion	443	steel, building.....	483																																																																																																																																																																																																																												
Demountable partitions.....	443	equipment	451	air curtain	417	steel, exterior.....	109, 110, 111																																																																																																																																																																																																																												
Dens Glass sheathing.....	182	levelers.....	365, 451	aluminum, patio	120, 121	steel, fire-rated	109																																																																																																																																																																																																																												
Deposit boxes	453	lifts	451	automatic	479	steel, patio	121, 122																																																																																																																																																																																																																												
Depository doors, after hours	453	seals	451	bar	118	steel, prehung	414																																																																																																																																																																																																																												
Desalination, water	250	shelters	452	basement	23	stile & rail	116, 117																																																																																																																																																																																																																												
Decks		Documentation, photographs	318	bi-fold	124, 125	stock room	418																																																																																																																																																																																																																												
bank	452	Dolly, rental	329	bypass	123, 124	storm	114, 115																																																																																																																																																																																																																												
study	459	Domes		café	118	strip	418																																																																																																																																																																																																																												
Detailed block	213	lighted ceilings	79	camber top	112	telescoping	417																																																																																																																																																																																																																												
Detection systems.....	591	playground	467	carved	107	units, packaged	414																																																																																																																																																																																																																												
Detectors		skylights	277	cellar	23	vault	418																																																																																																																																																																																																																												
audio	264	Door		cleanout, fireplace	151	vinyl, patio	121																																																																																																																																																																																																																												
fire	264	accessories, bypass	124	closet	119, 123, 124	with sidelites	111																																																																																																																																																																																																																												
infrared	264	aluminum	419	closet, installation	52	wood	110, 415																																																																																																																																																																																																																												
security	591	bank vault	452	composite	119	X-ray protective	484																																																																																																																																																																																																																												
smoke	264	bells, wiring	128	convenience store	485	Dormer	267, 268																																																																																																																																																																																																																												
vehicle	450	bottom	286	depository	453	flashing	268																																																																																																																																																																																																																												
Detour signs, barricade	22	casing	53, 108	Dutch		louvers	291																																																																																																																																																																																																																												
Dewatering	602	chimes	105	entry	107, 111, 112	studs	48																																																																																																																																																																																																																												
Diamond lath.....	188	cleaning	83	entry, steel	112	studs, steel	71, 72																																																																																																																																																																																																																												
Diaphragm meter	638	closers	105	exterior	106, 110	Dosch clay	212																																																																																																																																																																																																																												
Diffusers, light	583	closers, hinge pin	105	exterior, steel	109, 110, 111	Double doors	107, 119																																																																																																																																																																																																																												
Digging		coverings	273	fiberglass	112, 113, 415	Double sanitary tee, ABS	514																																																																																																																																																																																																																												
concrete work	338	demolition	101	fire	415	Double TY/cross	514																																																																																																																																																																																																																												
excavation	136	finish carpentry	52	fire-rated	109	Double wye, ABS	514																																																																																																																																																																																																																												
post holes	144	frame protectors	444	flexible strip	418	Double-cylinder door handle	170																																																																																																																																																																																																																												
Digital		frames, metal	387, 414	flush closet	124	Double-hung window	303																																																																																																																																																																																																																												
networking systems	131	frames, painting	240	flush exterior	106	screen	300																																																																																																																																																																																																																												
photography	318	frames, pocket	171	flush interior	116	vinyl	297, 298																																																																																																																																																																																																																												
Digital recorder	592	framing	43	folding	122	Double-track storm window	304																																																																																																																																																																																																																												
Dimension lumber	194, 201	framing, steel	65	folding, installation	52	Dough roller	456																																																																																																																																																																																																																												
Dimmer switches	129, 564	handle sets	170	foundation access	291	Douglas fir	194																																																																																																																																																																																																																												
Dimmer switches, fluorescent	564	hangers	171	frames, wood	415	clear	194, 196																																																																																																																																																																																																																												
Direct overhead	310	hangers, pocket	171	French, interior	117	flooring	156, 194, 196																																																																																																																																																																																																																												
Directory boards	441	hardware	53, 125	garage	164	Dowel supports	340																																																																																																																																																																																																																												
Dirt, recycling	332	hardware kit	171	handicapped	479	Down light, LED	584																																																																																																																																																																																																																												
Disability Insurance	285	hardware, exit	171	handicapped, automatic	479	Downspouts																																																																																																																																																																																																																													
Disabled, access for	476	hardware, garage	165	hangar	416	hardware, threshold	285, 286	hanging	52	industrial & commercial	404	Disappearing stairs	284	hinges	420	painting	240	Disconnect switches	577	jams, exterior	108	residential	167	Dishwashers		jams, interior	118	steel buildings	483	commercial	458	kick plates	170	Dozer		electrical	248	knockers	170	clearing	594	plumbing	248	lever latchset	170	excavation	138, 601	residential	248	lever, privacy	170	rental	138, 323	return panels	31	locks	122	Drafting		wiring	128	locksets	170	architectural	126	Dispensers		louvers	417	plans	20	beverage	458	mantels	295	survey	313	capuccino	458	mirrors	221	Draftshield	294	cash	453	openers	164	Dragline		gasoline	449	openings, framing	43	excavation	599	paper towel	445	openings, steel framing	65	rental	322	ticket	450	paint removal	233	Dragon teeth	450	toilet paper	445	painting, exterior	240	Drain		Disperser, rain gutters	406	painting, interior	241	fields	265	Display case, food	454	peep sights	171	fittings	512	Display panel for map, schedule	480	protectors	444	lines, demolition	333	Disposal		pulls	170	rock	604	asbestos	338	push plates	170	Drain pipe		fields	265	rehang	52	ABS	512	waste	332	removal	101, 337	copper	512	Disposers, garbage		repair	52	fittings	126	commercial	458	sealant	78	corrugated	631	residential	128, 248	seals, loading dock	452	Hi-Q	631	Dispute resolution	20	seals, weatherstrip	294	plastic	126, 512	Distillation, water	250	security switch	589	Drain protection	604	Distribution, electric	577	shim	52	Drainage		overhead	577	shoe	286	fabric	603	panels	570, 572	sidelites	110	pipe	126, 631	switchboards	570	sill, oak	286	slope protection	604			stop	171, 420	Drainage systems				stop molding	53					thresholds	222, 285, 421		
hardware, threshold	285, 286	hanging	52	industrial & commercial	404																																																																																																																																																																																																																														
Disappearing stairs	284	hinges	420	painting	240																																																																																																																																																																																																																														
Disconnect switches	577	jams, exterior	108	residential	167																																																																																																																																																																																																																														
Dishwashers		jams, interior	118	steel buildings	483																																																																																																																																																																																																																														
commercial	458	kick plates	170	Dozer																																																																																																																																																																																																																															
electrical	248	knockers	170	clearing	594																																																																																																																																																																																																																														
plumbing	248	lever latchset	170	excavation	138, 601																																																																																																																																																																																																																														
residential	248	lever, privacy	170	rental	138, 323																																																																																																																																																																																																																														
return panels	31	locks	122	Drafting																																																																																																																																																																																																																															
wiring	128	locksets	170	architectural	126																																																																																																																																																																																																																														
Dispensers		louvers	417	plans	20																																																																																																																																																																																																																														
beverage	458	mantels	295	survey	313																																																																																																																																																																																																																														
capuccino	458	mirrors	221	Draftshield	294																																																																																																																																																																																																																														
cash	453	openers	164	Dragline																																																																																																																																																																																																																															
gasoline	449	openings, framing	43	excavation	599																																																																																																																																																																																																																														
paper towel	445	openings, steel framing	65	rental	322																																																																																																																																																																																																																														
ticket	450	paint removal	233	Dragon teeth	450																																																																																																																																																																																																																														
toilet paper	445	painting, exterior	240	Drain																																																																																																																																																																																																																															
Disperser, rain gutters	406	painting, interior	241	fields	265																																																																																																																																																																																																																														
Display case, food	454	peep sights	171	fittings	512																																																																																																																																																																																																																														
Display panel for map, schedule	480	protectors	444	lines, demolition	333																																																																																																																																																																																																																														
Disposal		pulls	170	rock	604																																																																																																																																																																																																																														
asbestos	338	push plates	170	Drain pipe																																																																																																																																																																																																																															
fields	265	rehang	52	ABS	512																																																																																																																																																																																																																														
waste	332	removal	101, 337	copper	512																																																																																																																																																																																																																														
Disposers, garbage		repair	52	fittings	126																																																																																																																																																																																																																														
commercial	458	sealant	78	corrugated	631																																																																																																																																																																																																																														
residential	128, 248	seals, loading dock	452	Hi-Q	631																																																																																																																																																																																																																														
Dispute resolution	20	seals, weatherstrip	294	plastic	126, 512																																																																																																																																																																																																																														
Distillation, water	250	security switch	589	Drain protection	604																																																																																																																																																																																																																														
Distribution, electric	577	shim	52	Drainage																																																																																																																																																																																																																															
overhead	577	shoe	286	fabric	603																																																																																																																																																																																																																														
panels	570, 572	sidelites	110	pipe	126, 631																																																																																																																																																																																																																														
switchboards	570	sill, oak	286	slope protection	604																																																																																																																																																																																																																														
		stop	171, 420	Drainage systems																																																																																																																																																																																																																															
		stop molding	53																																																																																																																																																																																																																																
		thresholds	222, 285, 421																																																																																																																																																																																																																																

rock and sand fill	126	vinyl clad	424	roof coating	257	Embeco grout	355
Drainboards, countertops	290	wallboard	293	waterproofing	294	Embedded steel	387
laminated plastic	473	wallboard assemblies	34	Elbows		Embossed concrete	96
stainless steel	457	Drywall installer, wage		ABS	513	Emergency LED power	585
tile	433	industrial & commercial	309	black steel	494	Emergency lighting	587
Drains		residential	10	copper	504	Emergency shower	534
area	525	Drywall taper, wage,		CPVC	507	rough-in	531
fiberglass	634	residential	10	CPVC and brass	508	Emissions reduction	579, 581
floor	516, 525	Duct		PVC	506	Employer labor taxes	10
foundation footing	126	cable tray	557	Electric service		industrial & commercial	309
gratings	387	electrical	556	industrial & commercial	570	EMT	544
piping	126	fiberglass	177	residential	127	conduit	544
precast	127, 634	flex	177	temporary	310, 318	conduit circuits	547
rain	127	painting	437	Electrical		fittings	545
roof	525	sheet metal	177	alarm systems	128, 264	Enamel gloss, floor and porch	235
rough-in	532	underfloor	557	boxes	542	Encapsulated insulation	181
systems	127	underground	541	boxes, outlet	561	Enclosures	246, 272, 442
trench	634	Ductile iron pipe	628	building wire	558	bus stop	479
Draperies	127, 471	Ducting	253	cable tray	557	cubicles	442, 443
Drawers	29	Ductwork, painting	437	circuit breakers	567	panel	563
kitchen work table	454	Dumbwaiters	133, 488	conduit	543	sauna	263
stainless steel	454	Dummy knobs	421	cover plate	565	swimming pool	481
Drawings		Dump fees	332	cutouts	577	temporary	331
architectural	20	Dump trucks		device boxes	556	tennis court	481
as-built	126	debris hauling	337, 600	distribution	577	End cap	260
reproduction of	25	general hauling	137	duct, concrete	541	Endwall flashing	268
Drench showers	531, 534	rental	139, 324	duct, surface	556	Energy, solar	280
Dressing cubicles	442	Dumpsters, trash	332	fence, charging unit	144	Engineer, overhead	310
Drill rental	320, 326	Duplex nails	231	fuses	575	Engineering fees	134, 313
Drilled caissons	608	Duplex receptacles	129, 563	generators	131, 280, 578	tilt-up construction	362
Drilling		Dupont wood flooring	157	generators, rental	326	Enkebolt molding, cabinets	31
concrete	370	Durock backer board	290	ground wire	558	Entrance	
post holes	617	Dur-O-Wal	219	grounding	566	cap, threaded	544
rock	595	Dursban T-C	280	handy box	562	hoods	270
soil testing	279	Dust control	337	heater	175	mats	220, 474
steel	388	DWV pipe		heating	536	thresholds	285
well	295	ABS	512, 513	junction boxes	563	Entrances	
Drinking fountain	534	copper	512	lighting	128	colonial	134
handicapped	477	E		loadcenters	573	wood	134
rough-in	531	Earthwork	594	metallic tubing	543, 544	Entry doors	107, 111, 112
Drip cap	267, 268	compacting	603	motors	566	fiberglass	112, 113
door	287	Easings		multi-outlet raceway	557	Envalex ceiling domes	79
molding, wood	224, 276	stair	56, 284	outlet boxes	556	Environmental noise survey	134
Drip edge	267, 268	stair rail	284	outlets	129, 563	EPA	
Drive shoe	295	Eave closure	262	overhead	577	standards	581
Driveway gates	143, 165, 618	Eave louver vents	291	panels	572	Tier IV pollution control rating	579
Driveways		Eaves, painting	240	poles	577	EPDM	402
apron	615	Ecclesiastical		power, temporary	319	Epoxy	
asphalt	243	equipment	460	raceway	556	bed	382
coating	237	glass	470	raceway fittings	556	painting	437, 438
concrete	84, 94, 244, 615	Eco-Block	86	receptacle boxes	556	Epoxy-coated rebar	346
demolition	101, 332	Economics division	307	receptacles	129, 563	Epoxy-coated wire mesh	349
forms	88, 94	Edge forms, concrete	88, 340	sensor cable	589	Epoxy-tie adhesive	17
paint removal	234	Edge pulls	171	service	127	EPS forms	87
Drop		Edgers, rental	327	sprinkler controls	189	Equipment	449
ceiling	79	Edging		subcontract	127	checkroom	453
poles, electrical	318	redwood	187, 615, 625	switches	564	educational	458
Drop cloths	285	roof	267	switchgear	571	food service	453
painting	439	sill	286	systems, solar	280, 582	foundations	366
Dry pack grout	361	strip	154	temporary power	319	loading docks	451
Dry pipe sprinklers	492	Educational		transformers	572	mobilization	314
Dryers, clothes		networks	459	tubing	543	overhead	310
circuits	543	Educational equipment	458	underfloor duct	557	pads	352
receptacles	563	Efflorescence, testing	316	unit heater	535	paint sprayer	239
vent sets	291	Egg knob locksets	170	valves	189	painting	436
wiring	128	Eggcrate louvers	80	water heaters	130	parking control	450
Dryers, hand	446	Egress		wireway	556	service station	449
wiring	447	barrier	487	Electrician, wage		Equipment rental	320
Dryvit finish, exterior	400	portal	487	industrial & commercial	309	Erickson couplings	543
Drywall		window	305	residential	10	Erosion control	
adhesive	17	EIFS exterior wall system	400	Elascoteric		fabric	604
demolition	102, 335	Ejectors, sewage	528	flashing	373	fence	604
expansion joints	412	Elastomeric		latex sealant	78	landscaping	624
finish	168	flashing	373	membrane	294	silt fence	150
gypsum	168, 293, 423	latent sealant	78	painting	437, 438	soil covers, stabilization	603
insulation board	398	membrane	294	pipe insulation	523	Escalators	490
nails	229	painting	437, 438	Embankment grading	597	Escape window	305
painting	238, 241	pipe insulation	523	Eternit	261	Estimating, accuracy	5
primer	234			Etch, acid	466		
screws	229			Etching concrete	357		
specialties	424			Eternit	261		
texture	169						

Ethylene Propylene Diene Monomer	402	lath	188	estimating	313	adhesive	18
Euro pavers	215	masonry	219	overhead	310	paneling	243
European ISO standards	579, 581	preformed	412	recycling	332	Fibermesh screen	264
Evaporative coolers	177	sealants	412	scheduling	134, 311	FICA	285
Evaporator coil	179	Expansion tank	249	sewer connection	311	Field offices, temporary,	
Excavation		boiler	173	specification	314	rental	330
air hammer	138	Explosives, loading	595	testing	317	Fields, playing	465
backfilling	136	Exposed aggregate finish	95, 356	valuation	18	Fill	
backhoes	138	Extension cords, rental	327	water meter	312	caulking	79
blasting	595	Exterior doors	106	excavation	135, 339, 597		
brushing	138, 594	flush	106	rock	339, 604		
bulldozer	138	hollow metal	412	sand	339		
caissons	608	jams	108	slab base	339		
clearing	138	prehung	110				
compaction	136, 597	steel	414	Fill investigation			
concrete	86	Exterior house paint	234, 235	compacted	317		
dozer	601	Exterior Improvements	609	soil testing	279		
dragline	599	Exterior wall assemblies	35	Filler			
drilling	595, 608, 609	Exterior wall system (EIFS)	400	block	237		
embankment	597	Extinguishers, fire	434, 493	panels, cabinet	31		
equipment rental	138, 322	cabinets	493	wood filler	238		
erosion control	603, 604	Extruded polymer molding	226	Filler strip			
fine grading	135	Eye wash shower	531	cabinet	55		
footings	135			chain link fence	142		
foundation	338			Film, polyethylene	253		
grading	135, 339, 596			Filter sock	126, 631		
hand	602			Filter, air, central	176		
hand work	135, 339			Filters			
hauling	600			exhaust hood	455		
loaders	136, 597			screen	295		
loading trucks	138, 600			water	529		
manual	602			Financing, project	311		
pneumatic	138			Fine grading			
post holes	144			embankment	597		
ripping	596			hand	135		
riprap	604			landscaping	623		
rock	135			pavement	243, 609		
scraper-hauler	601			slabs	339, 596		
shovels	135			Finish carpentry	51		
slope protection	604			backing	51		
spreading	597			blocking	51		
spreading material by hand	136			cabinet installation	55		
sprinkling	138			cased openings	52		
tamping	339, 597, 599			closet poles	55		
tamping, by hand	136			closet shelves	55		
topsoil, by hand	136			countertops	96		
tractors	138			door accessories	105, 420		
tree removal	594			door casing	52		
trenching	136, 597			door trim	52		
trucks	138			doors	52		
wheel loaders	598			entrances	134		
Exhaust				fireplace mantels	55		
fume system	450			fireplace surrounds	55		
hoods, food service	455			flooring	197		
range hoods	253			flooring, wood	55		
vents, dryer	291			folding stairs	284		
Exhaust fan				furring	52		
bath	139, 140			hardware	420		
bath, with heater	141			job-built stairways	283		
food service	455			lockssets	53		
QuieTTest	140			lumber	226		
roof vent	407			mantels	208		
switch	141			medicine cabinets	220		
timer switch	141			molding	54, 226		
utility	139			paneling	54		
ValueTest	140			railings, stair	56		
wiring	128			running molding	55		
with infrared heater	140			sauna rooms	263		
Exhaust stack	581			shutters	272		
Existing conditions	332			siding	276		
Exit door hardware	421			skylights	277		
touch bar	171			softs	279		
Exit signs	586			stair balusters	56		
Expanded polystyrene board	399			stairs	56, 281		
Expansion				thresholds	285		
shields	373, 555			wall paneling	54		
strips	217			wallboard	293		
Expansion joints	426			weatherstripping	294		
composition	219			window sills	296		
concrete	85, 355			window trim	53		
covers	412			Finish grading	135, 187, 243		
glass block	381			Finish, drywall	168		
				Finishes	423		
				decks	98		
				flooring	431		
				gypsum wallboard	423		

plaster	244	Flanged pipe, cast iron	626	access	434	sandwich preparation units	454
wallpaper	293, 435	Flanges		anti-fatigue	432	service equipment	453
Finishing		ABS closet	515	artificial turf	465	stations	453
concrete	94, 95, 356	black steel	494	bamboo	157	toasters	456
flooring	156	Flash cone	268, 269	brick	220	warmers	454
nails	230	Flashing		carpet	76, 433	work tables	454
Fink truss	49, 72, 395	aluminum	267	carpet tile	434	Foot grille	474
Finned tube radiation	537	aluminum siding	276	ceramic tile	289	Football goal posts	465
Fir		building paper	27	crossband parquet	158	Footings	
flooring	156, 194, 196, 197	compound	257	demolition	101, 336	bell	609
Fire		copper	267	Douglas fir	156, 194, 196	bollard	616
alarm breaker	570	demolition	336	finishing	56	caissons	608
alarm systems	434, 591	galvanized	268, 404	fir	156, 194, 196, 197	column	94
alarms	128	lead	269, 404	flagstone	216, 220	concrete	84, 86, 93, 94, 351
boxes	151	masonry	373	floating hardwood	157	continuous	93
brick	212	paper	27	gymnasium	430, 464	demolition	100, 335
dampers	151	ridge	260	installation	431	drains	126
detectors	591	roof jack	526	marble	208, 381	estimating	93
doors	109, 415	roofing	260, 403	masonry	220, 382	excavation	135
escapes	387	sealant	78	non-slip tile	432	forms	86, 339
extinguishers	434, 493	sheet metal	267	parquet	430	keyway	93
hose cabinets	493	skylight	279	pedestal	434	spread	377
hydrants	627	stainless steel	404	Pergo	157	ties	86
hydrants, demolition	334	vinyl	270	pine	155, 156	tilt-up	361
pole tower, playground	469	Flexible conduit	553	plank	155	Forced air furnaces	177
protection	455	Flexible strip doors	418	quarry tile	381, 429	Forged steel valves	519
protection equipment	491, 492	Flexure test	315	raised, installation	434	Forklift, rental	324
pumper connection	493	Flexwood	434	resilient	431	Form stakes	205
sprinkler systems	150, 491	Flight, photography	313	rubber	432	Formboard, fiber deck	369
suppression	491	Float finish		safety tiles	432	Formica countertops	96
wall hydrants	493	concrete	95, 356	sheet vinyl	153, 431	Forming	
Fire retardant treatment	207	Float finished		softwood	156, 430	architectural	341
Fireblocks	45	glass	422	Tarkett	153	landing	346
Firebrick	212	Float glass	166, 422	terrazzo	382, 433	soffits	346
Fireclay	212	Float traps	540	tile	431, 434	Forms	
Fireplaces	151	Floating backing, steel	69	tile, vinyl	154	beam	345
brick	212	Floating hardwood flooring	157	tongue and groove	157	board	88
electric	152	Flood lights, LED	585	vinyl plank	432	breaker	355
finish carpentry	55	Floodlights	587	vinyl sheet	431	clamps	355
gas-burning	152	rental	327	vinyl tile	153, 431	column	340
mantels	208	Floor		wood	156, 430	concrete	86, 87, 93, 339
masonry	220, 374	adhesive	18, 154, 159	FlowGuard Gold pipe	507	concrete insulated	86, 87
prefabricated	374	assemblies, wood framed	33	Flue		curb	88
surrounds	55	cleaning	331	fireplace	152	footing	88
wood-burning	152	decking, steel	384	lining	216, 374	foundation	88
Fireproof caulking	78	decking, subflooring	42, 61, 392	Fluorescent (CFL)	192	keyway	88
Fireproofing		drains	516, 525	Fluorescent dimmer switches	564	liner, architectural	365
columns	409	drains, ABS	516	Fluorescent lighting	190, 582	liners	341
concrete	407	drains, plumbing	525, 532, 535	Flush bushing, ABS	516	oil, concrete	355
spray-on	409	enamel	235	Flush doors	124, 415	plastic	86, 87
testing	316	equipment rental	326	bi-fold closet	124	plywood	88, 339, 342, 369
wood	207	flange	515	birch interior	115, 116	release	355
Fire-rated		framing	34	fire-rated	109	shoring	605
doors	109	furring	50	hardboard	106	slab	340
Fire-rated doors	415, 416	grating	387	hardboard interior	115, 116, 118	snap ties	86
First aid, overhead	310	joists	34, 40, 41, 390	hardwood exterior	110	spreader	355
Fishtape, rental	329	joists, piecework	38	lauan exterior	106	stakes	86
Fittings		joists, steel	58, 73	lauan interior	116, 118	stripping	89
ABS bungalow	514	joists, steel blocking	61	oak interior	116	ties	86, 355
black steel	494	leveling compound	154	steel exterior	110	tilt-up	362
copper	503	mats	220, 473	steel utility	110	wall	88, 341
CPVC	507	painting	238, 437, 438	Flush interior doors		Formwork	
CPVC and brass	508	piecework rates	38	lauan	116	column	342, 344
drain pipe	126	plank, precast	358	Foam insulation	182	concrete	339
electrical	563	plate, steel	385	Foam panel adhesive	18	steel-framed plywood	342
PEX	509	polishing	238	Foamglass insulation	400	steps	346
PEX-AL	511	radiant heat	174	Foil-backed gypsum	424	stripping	89
Polyethylene pipe	629	safes	262, 452	Foil-faced insulation	398	Fortiber products	27
PVC	506	sheathing	34, 392	Folding beds	25	Foundation	
PVC water pipe	628	shellacking	238	Folding doors	122, 443	forms	88, 339
Fixtures		sinks, plumbing	535	locks	122	forms, reinforcing	88, 346
electrical	129, 190	slab, concrete	94	Folding fire partitions	444	formwork	339
lamps	588	slab, precast	358	Folding stairs	284	insulation	182
lighting	190, 588	staining	238	Food		investigation, soil testing	280
plumbing	535	steel, piecework	73	beverage dispenser	458	layout	189
rough-in	251, 252	varnishing	238	deep fat fryers	455	placing	351
Flagpoles	448	waxing	238	freezers	457	poisoning	280
aluminum	448	Floor layer, wage		meat and deli cases	454	soil calculations	279
foundations	449	industrial & commercial	309	mixers	457	stakes	205
Flagstone		residential	10	pizza preparation units	454	trenching	597
floors	216, 220	Flooring		pot and pan racks	456	vents	291
pavers	613					waterproofing	294
Flameproofed draperies	471					Foundations	

access door	291	Frequency meter	571	griddle	456	storefront	419																																																																																																												
anchor bolts	363	Fresnel globes	586	heating	535	tile	287																																																																																																												
anchors	58	Fresnel-type spotlight	463	log lighter	152	window	166, 422																																																																																																												
bell	609	Frieze molding	55	meters	638	wire	418																																																																																																												
bolts	159	Frieze vents	406	piping	252, 638																																																																																																														
caissons	608	Fringe benefits	309	range, commercial	456																																																																																																														
coating, asphalt	237	industrial & commercial	309	regulators	638																																																																																																														
concrete	84, 92, 339, 351, 353	residential	10	stops	522																																																																																																														
demolition	100, 335	FRP		storage tanks	541																																																																																																														
drains	126	adhesive	18	valves	152																																																																																																														
equipment	366	paneling	243	wall furnace	177																																																																																																														
excavation	338	Fryers, commercial	455	water heaters	526																																																																																																														
flagpoles	449	Fuel grates, fireplace	152	Gas station																																																																																																															
footings	93	Fuel storage tanks	540	air and water	450																																																																																																														
injected	608	Full-view storm doors	114	cash box	450																																																																																																														
masonry walls	377	Fume hoods	473	equipment	449																																																																																																														
pile	606	kitchen	455	hydraulic hoist	450																																																																																																														
pole	587	laboratory	473	pumps	449																																																																																																														
tilt-up construction	361	Fund control fees	311	Gas turbines	579																																																																																																														
Fountains		Fungus		additional costs	580																																																																																																														
decorative	486	preventer	268	generator sets	579																																																																																																														
drinking	534	treatment	207	heat recovery systems	580																																																																																																														
drinking, handicapped	477	Furnaces		Gaskets																																																																																																															
ornamental	486	direct vent gas	177	neoprene	403, 404, 412																																																																																																														
rough-in	531	electric work	128	sill plate	182																																																																																																														
wash	534	floor	177	Gasoline dispenser	449																																																																																																														
Frame seal sets	294	forced air	177	Gate valves	492, 519																																																																																																														
Frames		gas	176, 536	Gates																																																																																																															
door, painting	240, 241	gravity gas	176	automatic	165																																																																																																														
manhole	636	wall	536	barrier	450																																																																																																														
see-thru	418	Furnishings		chain link fence	143																																																																																																														
window, painting	239	church glass	470	hardware	143, 148, 618																																																																																																														
Framing		window treatment	471	ornamental	165																																																																																																														
adhesive	17	Furring	395, 425	parking control	450																																																																																																														
anchors	161	floor	50	security	115																																																																																																														
backing and nailers	47	studs	52	temporary	331																																																																																																														
beams	45	wood	50	trash enclosure	366																																																																																																														
blocking	41	Fuses	575	wood	147																																																																																																														
bracing	44	FUTA	285	wrought iron	388																																																																																																														
canopy	387	G		Gateway, electronic	131																																																																																																														
carpentry	32	Gabions	604	Gauges	524																																																																																																														
ceiling joists	46	Gable		liquid level	540																																																																																																														
clips	159	roof	36	Gel stain	237																																																																																																														
connectors	159, 161	truss	49, 73, 395	General contractor																																																																																																															
demolition	103	vents	291	crews	5																																																																																																														
door openings	43	power	142	markup	5, 209																																																																																																														
dormer studs	48	Game equipment	465	General requirements	310																																																																																																														
fascia	49	Garage doors	164	Generators	131, 578																																																																																																														
fireblocks	45	hardware	165	electric	280																																																																																																														
floor trusses	41	locks	165	exhaust stack	581																																																																																																														
furring	50	openers, wiring	128	gas turbine, pollution control																																																																																																															
grounds	51	operators	164	modules	581																																																																																																														
hardware	159	seals	294	motor-driven, pollution control																																																																																																															
ledgers and ribbons	47	steel	164	modules	579																																																																																																														
lumber	194, 201	weather seal	165	power	582																																																																																																														
nails	229	wood	164	rental	326																																																																																																														
piecework	37	Garage, carport	77	solar	280																																																																																																														
piecework rates	39, 74	Garage, epoxy floor	438	steam	285																																																																																																														
posts	45	Garbage disposers		wind turbine	132																																																																																																														
roof	47	commercial	458	Geodesic dome, playground	467																																																																																																														
roof sheathing	49, 50	electric work	128	Geographic cost adjustments	12–15																																																																																																														
roof trusses	48	fixtures	248	Geotextiles	603, 604																																																																																																														
steel	57, 67, 383	residential	248	Ginnies	205																																																																																																														
steel collar beams	72	Garden window	299	Girders																																																																																																															
steel exterior wall studs	63, 64	Garment rack	453	carpentry	40, 390																																																																																																														
steel interior wall studs	62, 63	Gas		concrete	351																																																																																																														
steel stud	62	appliance rough-in	252	forms	345																																																																																																														
subflooring	42	chlorination	629	precast	359																																																																																																														
trimmers and curbs	48	connections	252	shield flashing	268																																																																																																														
wall plates	42	distribution lines	638	steel	383																																																																																																														
wall sheathing	51	furnaces	176, 536	steel framing	60																																																																																																														
wall stud wood	389	G																																																																																																																	
walls, exterior	42	Garts																																																																																																																	
window opening	44	fireproofing	410	Framing nails, screw shank	229	steel	383	Free access flooring	434	Glass		Freezers		artwork	470	aggregate	350	food service	457	bead molding	224	aggregate concrete	85	medical	469	cleaning	83, 331	bollards	616	wiring (subcontract)	129	float	422	countertop	96	Freight elevators	490	mirrors	24, 446	curb	614	French doors	117	shelving	270	decomposed edging	625	interior, double	120	sliding doors	417	masonry	381	Frenchwood	120	furnaces	176, 536	paving	382, 614			G				Grasscloth	435	terraza	382			Grates		tile	287			fireplace	152			tree	626			Gratings, steel	387			Gravel				aggregate	18			landscaping	625			paving	244, 615			riprap	604			slab base	94			Gravel guard	268
Framing nails, screw shank	229	steel	383																																																																																																																
Free access flooring	434	Glass																																																																																																																	
Freezers		artwork	470	aggregate	350																																																																																																														
food service	457	bead molding	224	aggregate concrete	85																																																																																																														
medical	469	cleaning	83, 331	bollards	616																																																																																																														
wiring (subcontract)	129	float	422	countertop	96																																																																																																														
Freight elevators	490	mirrors	24, 446	curb	614																																																																																																														
French doors	117	shelving	270	decomposed edging	625																																																																																																														
interior, double	120	sliding doors	417	masonry	381																																																																																																														
Frenchwood	120	furnaces	176, 536	paving	382, 614																																																																																																														
		G																																																																																																																	
		Grasscloth	435	terraza	382																																																																																																														
		Grates		tile	287																																																																																																														
		fireplace	152																																																																																																																
		tree	626																																																																																																																
		Gratings, steel	387																																																																																																																
		Gravel																																																																																																																	
		aggregate	18																																																																																																																
		landscaping	625																																																																																																																
		paving	244, 615																																																																																																																
		riprap	604																																																																																																																
		slab base	94																																																																																																																
		Gravel guard	268																																																																																																																

Gravel stop.....	268, 403	equipment.....	464	doors, fire-rated	109	door.....	53, 420
demolition	336	floors	430, 464	doors, prehung	110	gate.....	148
Gray Board insulation	181	Gymnasium base.....	412	flooring	155, 430	Hip roof	36
Grease		Gypboard demolition	335	flooring demolition	101	clay tile	261
filters, exhaust hoods.....	455	Gypsum		paneling	242	fiber cement slate	261
interceptors	528	adhesive.....	17	plywood	242	rafters	48
Greenboard.....	168	ceiling panels.....	82	Hat channel.....	425	sheathing	50
panels	150	decking, poured	369	Hat racks	453	shingles.....	258, 259
Greenwaste recycling	332	demolition	102, 335	Hat shelf	55	steel rafters	70, 74
Grey iron.....	387	drywall	168, 293, 423	Hatches, roof	407	trusses.....	74
Griddles, gas.....	456	lath	187	Hauling			
Grid-WALL.....	87	paint preparation	239	debris	337	Hoists	
Grilles		plaster	244, 426	excavation	600	auto	450
foot	474	roofing	369	truck	138	construction	319
security.....	416, 485	roofing, demolition	336	Haunch forms	342	freight	490
Grills	469	Hair interceptors	528	Hazard surveys	338	rental	329
kitchen, commercial.....	456	Hammering, concrete	356	Hazards testing	26	service station	450
Grinders		Hammers		HDPE drain pipe	631	Hold down brackets	58
pneumatic, rental	320	for pile drivers, rental	322	Header hangers	161	Hold downs	161
rental	326	rental	322, 326	Header pipe	602	Hollow core doors	116, 117
stump, rental	327	Hand dryer	446	Headers		Hollow metal doors	412
Grinding concrete	356	Hand excavation	135	carpentry	45, 390	frames	414
Grits, concrete	356	Handholes, electric	542	yard	615	Hollow metal, painting	437
Ground cover	625	Handicapped		Heads		Home energy rating	184
Ground fault interrupter.....	128	access	476	sprinkler	621	Home inspection service	26
Ground rod clamps	566	door opener	479	Headwalls	638	Home networks	130
Ground wire.....	558	parking	477	Hearts, marble	208	Home office cost	310
Grounding		symbols, parking lot	616	Heat		hood filters	455
devices.....	128, 566	Handle sets, door	170	detectors	591	Hoods	
electric.....	566	Handrails		generation	535	entrance	270
locknuts	566	access flooring	434	recovery systems	580	exhaust, food service	455
Grounds, wood	51	iron	150	Heat exchanger foundations	366	laboratory	473
Grout		painting	238, 240, 438	Heat pumps	178	range	253, 254
brick pavers	613	patio deck	99	accessories	179	range, quiet	254
concrete	378	stair	56, 281, 284	Heat-A-Lamp heater and fan	141	range, vented	253
door frames	378	steel	386	Heaters		vents	260
forms, tilt-up	364	wall protection	444	baseboard	174, 175, 536	Hooks	
foundation	355	wood	224	electric	175	coat and hat	453
machine base	355	Handy box, electric	562	floor units	174, 175	robe	24, 446
manhole	637	Hanger rod	518	food	454	Hopper windows	300
masonry	209, 213, 378	Hangers		gas	535	Hopper, rental	325
mix, concrete	85	angle bracket	516	Gas wall furnace	176	Horizontal ladder, playground	467
pressure injected	357, 637	channel	555	Heating		Horns, paging	592
testing	316	clevis	517	ceilings, radiant	175	Hose	
tile	288, 289	conduit	554	central	174	air, rental	320
Grout, dry pack	361	framing	159	coil, heat pump	179	bibbs	522
Grouting		header and joist	161	ductless	178	clamps	291
concrete	96	joist	159	electric	175	fire, cabinet	493
concrete block cores	213, 378	painting	437	floor units	174	gate valves	523
pipe joints	637	pocket door	171	hot water assembly	253	reel	449
pressure	357, 637	roof	392	hybrid	174	rental	325
tilt-up	361	swivel ring	517	Heating and venting	538	Hospital	
GRS conduit	543	timber	161	radiant ceiling panels	175	cubicles	442
Grubbing	138, 594	Hanging doors	52	radiation	537	freezers, refrigerators	469
Guard		Hardboard	204	solar	528	Hot air dryers	446
corner	169, 387, 444	doors	106, 116, 118	Hot tub	246		
dog	265	doors, fire-rated	109	Hot water generators,			
gravel	268	lap siding	275	hydronic	536		
security	265	panel siding	274	Hot water heaters			
Guardrail		paneling	242, 435	commercial	526		
access flooring	434	wallcoverings	435	connections	252, 527		
construction	331	Heating and venting	538	gas, rough-in	252		
demolition	333	Hardener, concrete	356	residential	248		
highway	615	Hardi		Hot water heating	253, 537		
Gunite	357	panel	274	pipe	494		
testing	316	plank	274	Hot water storage tanks	529		
Gutters		trim	274	Hot water supply	252		
apron	268	Hardware		Hotmopping			
concrete .....	.95, 615	bath accessories	24	roofing	256		
copper	405	bi-fold door	125	waterproofing	397		
demolition	101	builder's	159	Hourly wages			
ice melting cable	561	cabinets	472	industrial & commercial	309		
inlets	637	commercial and industrial	420	residential	10		
rain	167, 404	garage door	165	House paint	235		
rain disperser	406	gate	148, 618	House street numbers	172		
sealant	78	partition	443	Housewrap	183		
stainless steel	406	pocket door	171	Tyvek	28		
wire, duct	556	rough	159	Housing, manufactured	480		
Gutting, demolition	335	rule of thumb	420	How to use this book	3		
Gym		threshold	285	Hubs, lumber	205		

Hurricane protection.....	273	Insulated service doors.....	416	Inverter system, solar.....	280
shutters.....	273	Insulated siding.....	401	Investigation, soil.....	279
ties.....	161	Insulating		Iron	
HVAC.....	535	board.....	181	cast.....	387
ducting.....	482	glass.....	166, 422	embedded.....	355
electric heaters.....	175	roof deck.....	369	wrought.....	388
furnaces.....	176	skylights.....	277	Iron worker, wage.....	309
heat pump.....	178	Insulation.....	181, 398	Ironing boards.....	186
hybrid central heating.....	174	analysis.....	184	Ironwork	
hydronic heating.....	172	asbestos, removal.....	338	ornamental.....	150, 388
mobile.....	464	board.....	398, 399, 400	railings.....	253, 386
radiant floor heating.....	174	cellular Foamglass.....	400	stairs, steel.....	387
residential.....	180	cellulose.....	183	wrought iron.....	388
stage.....	464	cold box.....	399	Irrigation systems	
Hydrants.....	493	Corbond.....	184	commercial.....	618
demolition.....	334	deck.....	369	residential.....	188, 189
meter.....	312	demolition.....	338	sprinklers.....	621
Hydrated lime		encapsulated.....	181	Island cabinets.....	31
builders'.....	218	expanded polystyrene.....	398, 399	Ivy.....	625
soil conditioner.....	623	FBX.....	183	J	
Hydraulic		fiberglass.....	181, 398	Jackhammer.....	596
door closers.....	105	foil.....	183	rental.....	139, 320
elevators.....	133	housewrap.....	183	Jackposts.....	186
excavators, rental.....	323	masonry.....	183	Jalousie window.....	299
jacks, rental.....	329	painting.....	437	Jamb	
truck cranes, rental.....	319	panel adhesive.....	18	exterior door.....	108
Hydroblasting.....	239, 263	perlite.....	399	side stripping.....	294
Hydronic		perlite board.....	400	window.....	53
controls.....	172	pipe.....	523	Jamb saws, rental.....	328
heating.....	172, 537	polyisocyanurate.....	399	Jamb sets	
heating, floor.....	174	polystyrene.....	181, 398, 399, 400	finger joint.....	118
hot water generators.....	536	pouring.....	183	interior.....	118
radiators.....	537	R-Gard.....	182	sold clear pine.....	118
Hydroseeding,		rockwool.....	183	with hinges.....	118
subcontract.....	187, 624	roof.....	399	James Hardie.....	274
I		SAFB.....	183	Jelly jar light.....	585
Ice and water shield.....	27	sill gasket.....	182	Jetting wellpoints.....	602
Ice cream dispenser.....	454	sound control.....	183	Jig cranes.....	491
Ice maker.....	457	sound control board.....	398, 423	Jig saws, rental.....	328
Ice melting cable.....	561	subcontract.....	183	Job site	
Ice plant.....	625	Super Tuff-R.....	399	costs.....	314, 318
Ice storage unit.....	457	testing.....	26	engineer.....	313
ICF.....	86	thermal.....	398	office.....	310
Identifying devices		urethane sheathing.....	182	office, temporary, rental.....	330
for handicapped.....	478	vermiculite.....	399	overhead.....	310
signs.....	441	weatherstrip.....	421	phone.....	319
I-Joist.....	41	Insurance		security service.....	265
Illumination, street.....	486	bonding.....	185	Job superintendent.....	314
Illustrations, architectural.....	20	contractor's.....	185	Joint cleaning, pavement.....	612
Impact windows.....	301	included in costs.....	3	Joint compound.....	168
Incandescent lighting.....	191	liability.....	185	Joints	
Incline lifts.....	133	overhead.....	310	brick.....	209
Indicator		Insurance, labor cost		expansion.....	85, 355
gauges.....	524	industrial & commercial.....	309	form.....	345
posts.....	627	residential.....	10	masonry.....	373
valves.....	523	Interceptors, plumbing.....	528	mortar.....	209, 613
Indirect overhead.....	310	Interest rate.....	311	paving.....	613
Induction cooktops.....	255	Interior doors.....	120	sandblasting.....	612
Industrial wage rates.....	309	birch, flush.....	115, 116	Joists	
Inertia sensors.....	589	café.....	118	bridges.....	159
Infiltration barrier		fir.....	117	bridging.....	41
house wrap.....	28	flush.....	116, 118, 119	carpentry.....	38, 390
Infrared		full louver.....	117	ceiling.....	46, 67
elevator door.....	133	half louver.....	117	ceiling, steel.....	67
heater and fan.....	140	hardboard.....	115, 116	concrete.....	353
heaters.....	175	heater closet.....	119	demolition.....	103
thermography.....	184	hemlock, prehung.....	120	floor.....	34, 41
Inlet protection.....	604	knotty alder.....	120	floor or ceiling.....	38, 73
Inlets, curb.....	637	lauan.....	117	forms.....	353
Insect screens.....	264	lauan, flush.....	116	hanger nails.....	230
Inserts, concrete.....	355	oak.....	117, 119	hangers.....	159
Inspection		oak, flush.....	116	I-joist.....	41
Baggage.....	487	pine.....	117, 120	painting.....	437
building.....	26	prehung.....	109, 119	piecework rates.....	38
pipe.....	629-631, 637	Interior paint.....	235	precast concrete.....	359
Instructions for this book.....	3	Interior wall		steel.....	384
Instrumentation, switchboard...	570	assemblies.....	34	steel floor.....	58
		Interlocking paving stones.....	382	steel framing.....	73
		Intermediate bracing,		steel, piecework.....	73
		steel framing.....	67	TJL.....	41
		Intermediate metal conduit.....	548		
		Internet connection.....	130		

Landscape	26	yard	587
irrigation wiring	189	Lighting fixtures	190, 588
lighting	191	exterior	588
site curbs	95	fluorescent	190, 582
Landscaping	624	indoor	588
Lane delineator	22	obstruction	586
Lane spikes	450	outdoor	190, 588
Lap cement	257, 258	outlets	129
Lap siding	275	Lightning	144
fiber cement	274	arrestor	144
spruce	201	protection	129
Laser level, rental	328	rods	129
Latchsets		Lights	
commercial	421	barricade	22
passage	170	canopy	587
privacy	170	solar powered, barricade	22
Latex		Lightweight concrete	85, 350, 369
block filler	237	Lime	623
deck, waterproofing	294	builders	218
house paint	235	field marker	218
masonry paint	235	landscaping	187
painting, labor	238	mason's	218
primer	234, 294	soil conditioner	187, 623
stain	236	Limestone	
stucco paint	235	masonry	381
Lath	425	paving	614
demolition	335	soil conditioner	623
gypsum	187	Letters, illuminated	441
redwood	198	Letters, signs	441
stakes	205	Levee excavation	603
steel	188	Link mats	220, 473
wood	205	Levelers, dock	451
Lather, wage		Leveling flooring	154
industrial & commercial	309	Levels, rental	327
residential	10	Lever locksets	170
Lathing	425	Lexan	482
Lattice		L-flashing	268
molding	224	Liability insurance	185
painting	240	Library	
Lauan		ladders	459
doors	106	shelving	459, 472
plywood	203	Lift slabs	353
Lauan doors		Lifting	
bi-fold closet	124	cranes, rental	322
flush interior	116	panels	364
flush prehung interior	118	Lifts	
molded face interior	117	dock	451
prehung heater closet	119	elevators	133
solid core flush interior	116	incline	133
Laundry		rental	324
clothes chutes	491	rolling platform, rental	324
clothesline units	84	wheelchair	133
sinks	248	Light bulb	
tub rough-in	252	CFL	192
Lava rock	381	LED	192
Lavatories	533	Light emitting diode	192
bases	290	Light fixture	
cabinets	290	LED	585
china	247	Light standards, demolition	334
marble	208	Light towers, rental	327
rough-in	531	Light, traffic	486
vanities	290	Light-gauge steel framing	56
Lawn		Lighting	190, 588
lighting	191	area	588
rollers, rental	327	bus stop shelters	479
seeding	187	can	191
sprinkler system	188, 189	court	466
sprinklers	619, 621	decorative	487
Lay-in ceiling	81	demolition	334
Layout	37	emergency	587
engineer	310, 313	landscape	191
foundation	189	LED wall pack	585
stakes	205	ornamental	487
survey	313, 595	panelboards	572
typical costs	314	poles	587
Leach fields	265	recessed	191
Lead		stage	463
flashing	269, 404	street	587
X-ray barriers	484	systems, solar	280
Lead mesh fabrics	471	temporary	310
Lead-based paint		tennis court	466
removal	233, 435	vandal-resistant	586
		yard	587
		Lighting fixtures	190, 588
		exterior	588
		fluorescent	190, 582
		indoor	588
		obstruction	586
		outdoor	190, 588
		outlets	129
		Lightning	144
		arrestor	144
		protection	129
		rods	129
		Lights	
		barricade	22
		canopy	587
		solar powered, barricade	22
		Lightweight concrete	85, 350, 369
		Lime	623
		builders	218
		field marker	218
		landscaping	187
		mason's	218
		soil conditioner	187, 623
		Limestone	
		masonry	381
		paving	614
		soil conditioner	623
		Letters, illuminated	441
		Letters, signs	441
		Levee excavation	603
		Link mats	220, 473
		Levelers, dock	451
		Leveling flooring	154
		Levels, rental	327
		Lever locksets	170
		Lexan	482
		L-flashing	268
		Liability insurance	185
		Library	
		ladders	459
		shelving	459, 472
		Lift slabs	353
		Lifting	
		cranes, rental	322
		panels	364
		Lifts	
		dock	451
		elevators	133
		incline	133
		rental	324
		rolling platform, rental	324
		wheelchair	133
		Light bulb	
		CFL	192
		LED	192
		Light emitting diode	192
		Light fixture	
		LED	585
		Light standards, demolition	334
		Light towers, rental	327
		Light, traffic	486
		Light-gauge steel framing	56
		Lighting	190, 588
		area	588
		bus stop shelters	479
		can	191
		court	466
		decorative	487
		demolition	334
		emergency	587
		landscape	191
		LED wall pack	585
		ornamental	487
		panelboards	572
		poles	587
		recessed	191
		stage	463
		street	587
		systems, solar	280
		temporary	310
		tennis court	466
		vandal-resistant	586
		yard	587
		Lighting fixtures	190, 588
		exterior	588
		fluorescent	190, 582
		indoor	588
		obstruction	586
		outdoor	190, 588
		outlets	129
		Lightning	144
		arrestor	144
		protection	129
		rods	129
		Lights	
		barricade	22
		canopy	587
		solar powered, barricade	22
		Lightweight concrete	85, 350, 369
		Lime	623
		builders	218
		field marker	218
		landscaping	187
		mason's	218
		soil conditioner	187, 623
		Limestone	
		masonry	381
		paving	614
		soil conditioner	623
		Letters, illuminated	441
		Letters, signs	441
		Levee excavation	603
		Link mats	220, 473
		Levelers, dock	451
		Leveling flooring	154
		Levels, rental	327
		Lever locksets	170
		Lexan	482
		L-flashing	268
		Liability insurance	185
		Library	
		ladders	459
		shelving	459, 472
		Lift slabs	353
		Lifting	
		cranes, rental	322
		panels	364
		Lifts	
		dock	451
		elevators	133
		incline	133
		rental	324
		rolling platform, rental	324
		wheelchair	133
		Light bulb	
		CFL	192
		LED	192
		Light emitting diode	192
		Light fixture	
		LED	585
		Light standards, demolition	334
		Light towers, rental	327
		Light, traffic	486
		Light-gauge steel framing	56
		Lighting	190, 588
		area	588
		bus stop shelters	479
		can	191
		court	466
		decorative	487
		demolition	334
		emergency	587
		landscape	191
		LED wall pack	585
		ornamental	487
		panelboards	572
		poles	587
		recessed	191
		stage	463
		street	587
		systems, solar	280
		temporary	310
		tennis court	466
		vandal-resistant	586
		yard	587
		Lighting fixtures	190, 588
		exterior	588
		fluorescent	190, 582
		indoor	588
		obstruction	586
		outdoor	190, 588
		outlets	129
		Lightning	144
		arrestor	144
		protection	129
		rods	129
		Lights	
		barricade	22
		canopy	587
		solar powered, barricade	22
		Lightweight concrete	85, 350, 369
		Lime	623
		builders	218
		field marker	218
		landscaping	187
		mason's	218
		soil conditioner	187, 623
		Limestone	
		masonry	381
		paving	614
		soil conditioner	623
		Letters, illuminated	441
		Letters, signs	441
		Levee excavation	603
		Link mats	220, 473
		Levelers, dock	451
		Leveling flooring	154
		Levels, rental	327
		Lever locksets	170
		Lexan	482
		L-flashing	268
		Liability insurance	185
		Library	
		ladders	459
		shelving	459, 472
		Lift slabs	353
		Lifting	
		cranes, rental	322
		panels	364
		Lifts	
		dock	451
		elevators	133
		incline	133
		rental	324
		rolling platform, rental	324
		wheelchair	133
		Light bulb	
		CFL	192
		LED	192
		Light emitting diode	192
		Light fixture	
		LED	585
		Light standards, demolition	334
		Light towers, rental	327
		Light, traffic	486
		Light-gauge steel framing	56
		Lighting	190, 588
		area	588
		bus stop shelters	479
		can	191
		court	466
		decorative	487
		demolition	334
		emergency	587
		landscape	191
		LED wall pack	585
		ornamental	487
		panelboards	572
		poles	587
		recessed	191
		stage	463
		street	587
		systems, solar	280
		temporary	310
		tennis court	466
		vandal-resistant	586
		yard	587
		Lighting fixtures	190, 588
		exterior	588
		fluorescent	190, 582
		indoor	588
		obstruction	586
		outdoor	190, 588
		outlets	129
		Lightning	144
		arrestor	144
		protection	129
		rods	129
		Lights	
		barricade	22
		canopy	587
		solar powered, barricade	22
		Lightweight concrete	85, 350, 369
		Lime	623
		builders	218
		field marker	218
		landscaping	187
		mason's	218
		soil conditioner	187, 623
		Limestone	
		masonry	381
		paving	614
		soil conditioner	623
		Letters, illuminated	441
		Letters, signs	441
		Levee excavation	603
		Link mats	220, 473
		Levelers, dock	451
		Leveling flooring	154
		Levels, rental	327
		Lever locksets	170
		Lexan	482
		L-flashing	268
		Liability insurance	185
		Library	
		ladders	459
		shelving	459, 472
		Lift slabs	353
		Lifting	
		cranes, rental	322
		panels	364
		Lifts	
		dock	451
		elevators	133
		incline	133
		rental	324
		rolling platform, rental	324
		wheelchair	133
		Light bulb	
		CFL	192
		LED	192
		Light emitting diode	192
		Light fixture	
		LED	585
		Light standards, demolition	334
	</		

Mansards, sheet metal	403	Material hoist	319	Mini-brick pavers	211 212
Mantels		Material lifts, rental	324	Mini-mat reinforcing	349
door and window	295	Mats		Mining camp barracks	480
fireplace	207, 208	entry	220, 473, 474	Miradrain	603
labor	55	erosion control	603	Mirafabrics	604
marble	208	MC cable	560	Miraflex	181
Manual excavation	602	MDF molding	226	Mirrored doors	
Manufactured housing	480	MDO plywood	203	bi-fold	125
Manure	623	Meat and deli case	454	bypass	123
Map display panel	480	Meat saw	454	Mirrors	
Maple paneling	242	Mechanical drawing, architectural	126	arches	221
Mapping, aerial	313	Mediation		bath accessories	24, 446
Marble		fees	19	beveled edge	167
bases	381	mobile	20	door	221
columns	381	Medical refrigerators	469	framed	221
flooring	208, 381	Medicare payroll taxes	285	frosted	221
masonry	381	Medicine cabinets	220, 446	medicine cabinet	220
setting	208	Medium-density plywood	203	specialties	446
sills	296	Medley sheet vinyl flooring	431	unframed	423
specialties	381	Membrane		vanity	221
thresholds	381	detaching	94	Mission	
tile	287	Ditra	94	brick	212
vanity tops	97	poly film	253	paver	212
Marble setter, wage		roofing	401	tile roofing	261
industrial & commercial	309	Mesh		Miter saws, rental	328
residential	10	reinforcing	91, 349	Mitt, painting	436
Margin, profit	208	steel	91	Mix design, concrete	315
Marine		Mesh, steel	346	Mixers, cement, rental	321
adhesive	78	Message board, traffic control	326	Mixers, food	457
plywood	203	Metal		Mixing valves, thermostatic	540
varnish	236	aluminum screens	388	Mobile home port	77
Markerboard, chalkboard	440	buildings	483	Mobile mediation	20
Markers, road	616	door frames	414	Mobilization	314
Marking		fabricated	387	piles, earthwork	606
parking lot spaces	616	facing panels	401	Mobilization cost defined	3
pavement	616	lath	425	Modification factors, cost, by area	12-15
Markup	310	ornamental	388	Modified bitumen	
contingency	208	painting	436, 437	adhesive	258
general contractor	5	painting, preparation	239	SBS roll roofing	257
project	310	pans, ceiling	82	Modular	
subcontractor	5	primer	234, 236	brick	209, 210
Masking, surface prep	439	roofing	260	cabinets	29
Masonry	220, 371	screen doors	113	carpet tile	434
acid-proof	375	siding, painting	437	Modulating valves	523
anchors	556	studs, demolition	335	Moisture protection	253, 397
block	213, 378	trim, painting	436, 437	Moisture test, soil	279
brick	373	Metal detector	487	Moisture-resistant drywall	168
cleaning	372	rental	329	Molding	
demolition	100	Metal roofing	260	door	108
fireplace	151	Metal-clad cable	560	MDF	226
furring	50	Metal-framed shaft walls	427	redwood	222
glass block	217	Meter boxes	221, 573	softwood	223
insulation	183	Meters		window apron	53
joints	371	electric	571	Molding	
materials	220, 373	fees	312	brick	108
mortar	219	gas	638	cabinet	31
nails	230	steam	524	carpentry	55
paint	235	water	312, 524	cornice or crown	54
painting	239, 438	Met-tile	260	door	53
parging	382	Microphone		fireplace	55
pointing	371	public address	592	hardwood	222
preparation	239	stage	463	stop	108
recycling	332	Microwave	456	stucco	108
reinforcing	372	cabinets	31	T-astragal	108
sandblasting	263	Midget louvers	292	vinyl	226
sawing	370	Milano awnings	471	Monitor panels	591
steam cleaning	371	Milgard	299	Monitors, alarms	264
surface prep	437	Milling, cold, asphalt	611	Mono rock, concrete	357
testing	316	Millwork, treatment	207	Monolithic topping, concrete	357
waterproofer	235	Millwright, wage		Monorail for electric hoists	490
waterproofing	294	industrial & commercial	309	Monuments, survey	313
Mass excavation	601	residential	10	Mop resilient floor	331
Mastercure	95	Mineral insulation	399	Mop sink	457, 534
Mastic		Mineral spirits	238	rough-in	531
adhesives	18	Mineral surface roll roofing	257	Moped racks	475
painting	437	Mini split	178	Morgue equipment	470
roofing	257	Mini split door	112	Mortar	
tile	288, 289	block	209	cement	82
Mat reinforcing steel	349	safety, scaffolding	329	color	218, 613
Material costs defined	3	Mats		glass block	217
Material demolition	337	entry	220, 473, 474	masonry	209, 218, 219
Material handling systems	491	erosion control	603	mix	82
		MC cable	560	paving	614
		MDF molding	226	shower bed	272
		MDO plywood	203	testing	316
		Meat and deli case	454	tile	289
		Meat saw	454	trowel-ready	219
		Mechanical drawing, architectural	126	Mortise	
		Mediation		hinges	172
		fees	19	lockset	170
		mobile	20	Mosaic and terrazzo worker, wage	
		Medical refrigerators	469	industrial & commercial	309
		Medicare payroll taxes	285	residential	10
		Medicine cabinets	220, 446	Mosaic tile	288, 428
		Medium-density plywood	203	Moss preventer	268
		Medley sheet vinyl flooring	431	Motor	
		Membrane		connection	567
		detaching	94	generator sets	578
		Mesh		starters	567
		reinforcing	91, 349	Motor graders, rental	323
		steel	91	Motorcycle racks	475
		Mesh, steel	346	Motors, electric	566
		Message board, traffic control	326	Movable partitions	443
		Metal		Moving	
		aluminum screens	388	excavated material	600
		buildings	483	stairs	490
		door frames	414	structures	338
		fabricated	387	MRI	487
		facing panels	401	Mud sills	389
		lath	425	anchors	58, 161
		ornamental	388	Mulch	187
		painting	436, 437	Mullion casing	224
		painting, preparation	239	Murphy wall beds	25

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
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

O

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.....	392
panels.....	203
roof panels.....	392, 393
roof sheathing.....	194
sheathing.....	42, 51, 62, 391, 392

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	
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
decks.....	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
Panelized	
roof system.....	392
shingle siding.....	276
Panels	
breaker.....	572
fiberglass.....	150
greenhouse.....	150
polycarbonate.....	150
radiant 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
Parallel bars.....	465
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	Pictures, job site	318	Polyethylene corrugated	634	Platform lifts	
brick	243, 612	Piecework		PVC	512	dock	451
cold milling	611	metal carpentry, floor sheathing	74	PVC Schedule 40	506, 620	rental	324
concrete	84, 94, 244, 611	metal carpentry, rafters	75	PVC Schedule 80	506	Platform, scaffold, purchase	330
demolition	102, 332	metal carpentry, roof framing	74	PVC sewer pipe	266	Playground equipment	467
equipment rental	325	metal carpentry, roof sheathing	76	railing	386	Playing fields, synthetic	465
grass	244, 615	rough carpentry	37	rolls	518	Plenum cable	593
joint treatment	613	rough carpentry, floor sheathing	38	sewer	265	Plexiglas	167, 422, 480
machine, rental	325	rough carpentry, roof sheathing	39	sewer, PVC	630	Plinth block, MDF	226
parking lots	610	Pier		sterilization	629	Plugmould	557
repair	611	blocks	39	storm	632	Plugs	
stones	382	caps	389	straps	518	cleanout	516
subcontract	243	pads	39	troubleshooting service	266	electrical	564
systems	244, 615	Pilasters	134	TV inspection	637	test	515
Turfstone paving	615	cabinets	31	valves	523	Plumber, wage	
Payment bonds	186	molding	55	vitrified clay	266	industrial & commercial	309
Payroll taxes	285	painting	240	water, PVC	628	residential	10
PCBs, removal	435	Pile caps, concrete	340	Pipefitter, wage	309	Plumber's flash cone	404
Pea gravel		Pile driver, wage	309	Piping, gas	252	Plumber's tape	518
concrete	85	Pile driving	606	Pitch pockets	404	Plumbing	494
landscaping	625	Pile driving, rental	322	Pits, excavation, dug by hand	136	access doors	253, 525
riprap	604	Pile foundations	606	Pizza preparation unit	454	area drains	525
Peat humus	623	Piles		Placing concrete	95, 349	assemblies	251, 530, 532
Pedestal flooring	434	landscaping	625	Plan check fee	28	cleanouts	525
Pedestrian bridge	487	treatment	206	Plank		copper DWV	512
Peep sights	171	Piling, sheet steel	605	flooring	56, 155	equipment rental	328
Pegboard, hardboard	435	Pine		precast concrete	358	fixtures	535
Penetrating stain	236	building poles	204	scaffold, aluminum extension		fixtures, cleaning	83
Penny nail sizes, defined	227	decks	98	purchase	330	floor drains	525
Pension costs defined	3	eastern	197	Plank flooring		for handicapped	478
Penta treated post	204	flooring	155, 156	vinyl	432	piping	532
Percolation testing	265	jamb sets	118	Plans	25	roof drains	525
Percolator, coffee	458	lumber	197	Plants, landscape	624	rough-in	251, 532
Perforated pipe	632	paneling	242	Plaques	442	systems	251
Performance bonds	186	Ponderosa	197	Plaster		water softener	250
Pergo wood flooring	157	siding	199	accessories	426	Plyclips	162
installation kit, rental	326	southern	195, 196	demolition	102, 335	Plyform	203, 339
Pergola	99	stakes	205	ground	224	Plywood	203, 391
Perimeter door seal	452	timber	202	joints	412	backboard	460
Perimeter wall insulation	182	white	196	labor	244, 426	birch	203
Perlins, steel	72	Pipe		mixer, rental	321	'board-up'	274
Perlite soil conditioner	623	ABS	126, 512	painting	241	cap molding	226
Permanent bond adhesive	258	asbestos removal	338	ring	561	cedar	203
Permits		black steel	494	soffits	244	ceiling	54
building	28	bollards	616	stucco	427	deck, waterproofing	294
well drilling	295	cast iron	626	Plasterboard		demolition	102
Pest control		clamps	518	drywall	423	exterior	202
soil treatment	280	clay	635	nails	230	fence	331
wood treatment	207	cleaning	630, 631	Plasterer, wage		forms	88, 339
Pet		columns	384	industrial & commercial	309	framing clips	162
doors	122	concrete	631, 632	residential	10	luau	203
Petroleum storage tanks	540	conveyors	491	Plasterer's helper, wage		lumber	202
Pews	460	copper	503, 512	residential	10	marine-grade	203
PEX pipe	509	corrugated metal	633, 634	industrial & commercial	309	MDO	203
PEX-AL pipe	511	corrugated polyethylene	631	Plastering	244, 426	oak	203
Pharmacy refrigerators	469	CPVC	507, 508	fireproofing	409	paneling	242, 392
Phone support	5	culvert	633	stucco	427	piecework rates	39, 74
Phones		cutters, rental	328	Plasterkraft	27	roof panels	392
temporary	310	demolition	333	Plastic		sheathing	42, 51, 61, 391
wiring	591	drainage	126, 512	countertops, laminated	473	sheathing, piecework	39, 76
Photo mapping, aerial	313	ductile iron	628	drain pipe	126	siding	203, 275
Photo micrographs	317	DWV	512	forms	86, 87	softwood	202
Photoelectric		elliptical	632	laminates	435	structural	203
sensors	589	equipment rental	328	lumber	99, 204	subfloor	42, 61
switches	565	fire protection	508	resin glue	18	subfloor, piecework	39, 76
Photographs		foundation drains	126	sewer pipe	266	treatment	207
aerial	313	gas	252, 638	shutters	272	underlayment	432
construction	318	grouting	637	siding	276	window covering	274
retouching	318	guard	365	skylights	277		
Photovoltaic		guides	518	speed bumps	617		
solar equipment	280	inspection	629, 630, 631	tarps	285		
Photovoltaic systems	582	insulation	523	tile	429		
Picket fence	148, 149	asbestos removal	338	vapor barrier	253, 352, 353		
painting	240	insulation, painting	437	Plasticized concrete	85		
Pickling stain	237	jacking	638	Plate straps	163		
Picture frame molding	224	levels, rental	328	Plates			
Picture rail	55	locating	266	carpentry	40, 57, 390		
Picture window	299	markers	318	carpentry piecework	42, 67		
		painting	437	door hardware	170, 421		
		perforated	631, 632	electrical	565		
		PEX	509	splash	255		
		PEX-AL	511	switch	23		
		piles	608				
		plastic	126				
		polyethylene	126, 618, 621, 638				

Poles	121
building	204
closets	55
concrete	360
cross arms	577
demolition	334
flag	448
foundations	587
job sign	318
lighting	587
lumber	204
playground	467, 469
power distribution	577
pressure-treated	205
removal	334
temporary utility power	318
treatment	206
Polishing	
floors	238
woodwork	241
Pollution control	579, 581, 604
Poly E Pipe	621
Polybutene tape	412
Polycarbonate	
glazing	482
sheets	166, 423
skylights	277
Polyester fabric	257
Polyethylene	
corrugated pipe	634
film	253
gas pipe	638
membrane, slab	94, 339, 352, 353
pipe	126, 618
tarps	285
tilt-up	362
Poly-faced insulation	181
Polyisobutylene	412
Polyisocyanurate	
insulation	182, 399
Polypropylene mesh reinforcing	85
Polystyrene	
board	398
insulation	181, 182, 398, 400
insulation board	398
roof deck	400
Polyurethane	
floor finish	56
insulation	184
paint	236
painting	438
sealant	410
Ponderosa pine	
boards	197
lumber	197
mantels	208
Pool, swimming	
coating	237
complete installation	475
cover	476
deck	369
enclosures	481
fences	150
gunite	357
heaters	250
painting	237, 438
resurfacing	369
Popcorn	
ceiling, removal	169
Popcorn ceiling	169
Poplar flooring	155
Pop-up sprinklers	189
Porcelain tile	287
Porch	
columns	84
enamel	235
enclosed	167
lifts	133
painting	240, 438
posts	84
rail	253
Porous paving	244
Portable structures	480
Portable toilet (Port-a-Potty)	310
Portland cement	82
Post	
anchors	163
bases	162
caps	163
column forms	340
indicators	627
painting	438
Post holes	144
fences	617
footings	617
Postal specialties	447
Posts	
athletic equipment	465
barrier	452
bollards	616
building	204
cabinet	31
carpentry	39, 45
deck	99
fence	144
guardrail	615
jackposts	186
newel	56
porch	84
pressure-treated	205
redwood	204
sawn	204
treatment, lumber preservation	206
yellow pine	204
Pot hooks	454, 456
Pot racks	456
Pot wash sink	457
Pour strip, tilt-up	362
Pouring	
concrete	95, 351
insulation	183, 399
Pour-stop forms	340, 342
Powder-driven fasteners	231
Power	
cable	560
conduit	543
distribution	577
EMT	547
generation	131, 582
generation, solar	280
panels	572
solar	582
temporary, pole rental	310, 318
underground	541
Power factor meter	571
Power generator exhaust	
stack	581
Power ventilators	
attic gable	142
roof-mount	142
Precast	
beams	359
columns	359
concrete	357, 633
culvert	633
double tees	360
drains	634
floor plank	358
floor slab	358
girders	359
joists	359
manholes	636
panels	357
stairs	360
Precipitators	455
Pre-engineered buildings	483
Preformed siding	401
Prehung doors	52, 118-120, 415
double	119
exterior	109, 110, 111
fire-rated	109
French	120
heater closet	119
oak	119
patio, steel	121
steel	111, 112, 414
Preliminary soil investigation	279
Prepare surface,	
painting	239, 437, 439
Presentation	
board	440
Preservation, lumber	207
Preservative, wood	237
Pressure	
controls	524
gauge	524
grouting	357
mats	264
regulators, gas	638
regulators, hydronic heating	539
treatment, lumber	207
vacuum breaker	312
Pressure washer, rental	328
Pressure washing	239, 436
Pressure-reducing valves	522, 539
Pressure-treated lumber	201
Prestressed concrete	360
Prime coat, pavement	611
Primer	
asphalt	466
clean metal	236
linseed	234
metal	236
painting	239
sealer, oil-based	234
Prints, plans	25
Privacy latchset	170
Processed lime	218
Profit markup	208, 310
Project	
cost adjustments	12-15
financing	311
manager cost	310
scheduling	311
Propane	
furnaces	176
tanks	541
water heaters	249
Property boundaries	313
Provisa range hood	254
P-traps, ABS	516
Public address systems	464, 592
Pull box, electrical	542, 562
Pull plates	170, 421
Pulls, edge, pocket door	171
Pulpits	460
Pump mix concrete	85
Pumper firehouse connection	493
Pumping	
concrete	350, 351
dewatering	602
well	295
Pumps	
electrical connections	129
foundation	366
gasoline	449
rental	324
sewer	265
sump	528
sump, wiring	129
wiring	130
Punch down, network cable	460
Punch-down blocks	593
Purlins	
anchors	161
carpentry	48, 390
fireproofing	410
hangers	161
steel	383
steel framing	72
Purse shelf	442
Push plates	170, 421
Putty, glass	239
PV (photovoltaic) solar	239
equipment	280
PVC	
clamp	551
conduit	548
conduit body	550
conduit box adapter	549
conduit with wire	551
end bell	549
flashing	270
jacketed copper tubing	505
pipe	265, 506
pipe, Schedule 40	620
reducer bushing	549
sewer pipe	266, 630
water pipe	628
Q	
Quality control engineer	313
Quantities defined	3
Quarry tile	
flooring	381, 429
masonry	220, 381
wall tile	381
Quarry work	596
Quarter round mold	225
Quarter round molding	222
Quartz heaters	175
Quick coupling valves	622
QuiETTest exhaust fan	140
Quietzone	183
Quonset huts	483
R	
Raceway, electric	556
Racks	
coat and hat	453
garment	453
kitchen	456
ladle	454
pots and pans	456
towel	24
Racks, security	
bicycle	475
motorcycle	475
Radial wall forms	342
Radiant heat, floor	174
Radiant heating	175, 479
Radiation protection	484
Radiators, heating	537
Radio studio	488
Radioactivity, removal	435
Radon gas, testing	26
Rafters	
bay vent channel	292
demolition	103
log	193
piecework rates	39
rough carpentry	47
spacing	292
steel framing	70
steel, piecework rates	74
timber	193
vents	292
Rail	
communion	461
fence	145, 148
guard	331
hand	150
molding, cabinets	31
painting	438
stair	283
Railing	
access flooring	434
aluminum	386
brass	386
for handicapped	476
highway	615
painting	240, 240
patio deck	99

porch, steel	253	saunas	264	demolition	336	vinyl	270
stair	56	siding	199	installation	431	Roll roofing	402
stair, wood	281, 397	strips, chain link	142	Resilient hat channel, drywall	169	adhesive	258
steel	253, 386	treads	99	Resorcinol glue	18	felt	257
temporary	331	Reflective signs	617	Restaurant		fiberglass	257
tubular	386	Refrigeration, insulation	399	equipment	453	mineral surface	257, 259
wrought iron	386	Refrigerators		range	456	papers	258
Railroad demolition	334	backbar	457	Restraints, water heater	527	Roller, dough	456
Rain diverter	268	food service	457	Retaining wall forms	92, 341	Rollers, rental	321
Rain gutter		medical	469	Retaining walls	375	Rolling	
stainless	406	morgue	470	ladders	459	ladders	
steel	406	Reglet		Return bends	516	Rolling platform lifts, rental	324
Rain gutters	167	copper	268	Reveal strips		Rolling towers, rental	324
Raingear, copper	405	parapet	365	formwork	342, 363	Roll-up	
Raised floors	434	Regulator valves	523	tilt-up	363	doors	415
Rammers		Regulators, pressure, hydronic		Reverse osmosis filters	529	window blinds	296
compacting	599	heating	539	Revolving doors	416	Romex cable	127, 542, 559
rental	321	Reinforcing		R-Gard insulation	182	Roof	
Ramp forms, riser	346	bar supports	340	Ribbons (ribbands), carpentry	47	apron	268
Ramps		bars	89, 346, 365	Ridge		bay window	304
access flooring	434	caissons	349	clay tile	261	built-up	256
handicapped	476	chairs	348	fiber cement	261	cant strips	50, 182, 403
rental	329	columns	349	flashing	260	coating	237, 256, 257, 401
Range circuit	543	demolition	332	sheet metal roofing	260	cold, for log home	194
Range hood	253, 254	fiber mesh	85	shingles	258, 259	deck cover	99
convertible	254	foundation	346	steel framing	72	deck, cementitious	402
custom	254	gunite	357	vents	292	deck, concrete	369
food service	455	masonry	215	Ridgeboard, steel	72	deck, steel	384
vented	253	masonry ties	159	Rigid conduit	543	deck, wood	392, 403
Range support, cabinets	31	mesh	91, 349	Rigid insulation	182	demolition	102
Ranges		mesh mini-mat	349	Ring steel reinforcing	348	drains	525
electrical work	129	pavement	244	Ripping, excavation	596, 601	edge	267, 268, 270
gas, commercial	456	rings	348	Riprap	604	edging	267
residential	255	slabs	92, 346, 349	Risers		EPDM	402
Rastral Block	87	splicing	348	concrete stair	95, 351, 360	flashing	27, 268, 269
Rates, labor	7, 8, 9	steel	89, 346	concrete stair, forming	346	framing	36, 39, 47, 74
Rattan black paper	27	steel, epoxy-coated	346	flagstone	216	framing, panelized	392
Reactivity testing	314	stirrup	347	masonry	216	framing, steel	70, 74
Ready-mix concrete	84, 350	tilt-up	362	rubber	220	ice melting cable	561
Rebar		walkways	615	sprinkler heads	189	insulation	399
chairs	348	welding	346	stair	56, 283	insulation board	399
concrete	89, 346	Reinforcing ironworker, wage		steel stairs	282	jacks	526
epoxy-coated	346	industrial & commercial	309	wood stairs	281, 397	joints	392
footings	346	residential	10	RO filters, water	529	loading	262
masonry	372	Relief valves	522, 539	Road		membrane	256
rings	348	Relocatable structures,		compaction	603	paint removal	233
slabs	346	manufactured type	480	equipment rental	325	painting	240, 438
splicing	348	Remote high gain antenna	130	grading	596	pan	268
stirrup	347	Removal		paving	610	panels	392
Receptacles, electric	129, 563	asbestos	338	repairing	611	paper	27
cover plate	565	clearing	594	rollers, rental	321	patio	99
outlet circuit	542	debris	337	striping	616	safes	404
wiring	129	demolition	334	trim and finish	603	sheathing	49, 392, 403
Receptors, shower	272	lead-based paint	233, 435	Road closed sign	22	testing	316
Recessed lighting	191	paving and curb	477	Road plate, steel	325	tile, concrete	261
Recording meters	571	PCBs	435	Robe hooks	24, 446	trusses	48, 72, 395
Recycling fees	332	radioactivity	435	Rock		trusses, piecework rates	38, 74
Red cedar		toxic chemicals	435	aggregate	18	underlay	27
beams and timbers	201	tree	138, 594	cinder	604	vent kit, bath	141
boards	198	wallpaper	293	drain rock fill	604	vent, turbine	141
fence	148	Rendings, architectural	20, 126	drilling	595	vents	292
lumber	195	Rent, overhead	310	drills, rental	320	windows	279
shakes	259	Rental		excavation	135	Roofer, wage	
shingles	259	backhoe	322	fill	604	industrial & commercial	309
siding	199	bulldozer	323	ornamental	604	residential	10
Red oak		compactor	321	recycling	332	Roofing	
boards	198	compressor	320	ripping	596, 601	algae-resistant shingles	258
closet doors	124	forklift	324	Rock fill drainage systems	126	asphalt	257, 258
doors	117	landscape equipment	327	Rockwool insulation	183	assemblies	37
Red oxide primer	234	miscellaneous equip.	329	Rod clamps	554	base sheet	256, 257, 258
Red rosin sheathing	27	plumbing equipment	328	Rod hanger	554	built-up	256, 401
Reducer strip, flooring	155	road equipment	325	Rod, threaded	161	cant strips	50, 182, 403
Reducer, drain pipe	126	scaffolding	329	Rods		cement	256, 258
Redwood		Rental, equipment	320	lightning	129	clay tile	261
benderboard	187, 625	Report		shower curtain	24	concrete tile	261
deck stairs	99	home inspection	26	Roll flashing		copper	404
decking	98	soil test	279	copper	267	corrugated	260, 401
fascia	49	Reproduction, plans	25	galvanized	268	demolition	102
fence	147, 148	Residential		lead	269	EPDM	402
headers	615, 625	rules of thumb	307	paper-backed copper	268	felt	257, 258, 401
lumber	195, 198, 201	Residential wage rates	10	ridge roll	260	fiber cement slate	261
molding	222	Resilient flooring	153	valley	268	fiberglass panels	150

membrane.....	256	water closet.....	530	concrete.....	263, 356
metal.....	260	Rough-sawn siding.....	275	equipment rental.....	325
nails, coil.....	230	Round molding.....	225	joints.....	612
nails, galvanized.....	230	Router-groover, rental.....	325	masonry.....	263, 371
nails, plastic cap.....	231	Routers, rental.....	328	steel.....	263
paper.....	258	Rowing machine.....	465	tilt-up.....	365
photovoltaic.....	280	RSC conduit.....	543	Sandblastng equipment rental.....	325
red cedar.....	259	Rub carborundum.....	95, 356	Sandbox, playground.....	467
roll.....	257	concrete finish.....	95, 356	Sanders, rental.....	328
rule of thumb costs.....	255	Rubber flooring.....	432	Sanding, floor... 155, 156, 238, 431	
shake.....	259	mats.....	220	Sanding, painting.....	436, 439
sheet.....	260	studded tile.....	154	Sandstone, masonry.....	381
sheet metal.....	260, 403	tile.....	432	Sandwich preparation unit.....	454
shingles.....	259	Rubberized asphalt.....	611	Sanitary napkin dispenser.....	445
slate.....	260	Rubble, masonry.....	381	Sanitary piping, demolition.....	333
solar.....	280	Rugs, carpet.....	76, 433	Sanitary sewer cleaning.....	631
Spanish tile.....	261	Rule of thumb costs carpentry.....	32	Sanitary tees, ABS.....	514
staples.....	231	electrical work.....	127	Sash bar molding.....	225
steel panel.....	260	hardware.....	420	Sash, painting.....	241
system.....	402	residential construction.....	307	Sauna heaters, wiring.....	128, 263
tar.....	256	roofing.....	255	modular rooms.....	263
tile.....	261	steel framing.....	56	room.....	535
Roof-mount power ventilator....	142	Runners.....	220, 473	Saw, meat.....	454
Roof-to-wall flashing.....	268	mats.....	220	Saw, rental chain saw.....	139
Room dividers doors, folding.....	444	rubber.....	220	concrete.....	321
partitions.....	444	Running track.....	465	Sawing asphalt.....	371
Rope climb, playground.....	467	Runoff protection.....	604	concrete.....	362, 370
Rosin sheathing.....	27	Rust-converting metal primer... 236		masonry wall.....	370
Rotary roof ventilators....	292, 407	Rust-inhibiting primer.....	234	Sawn posts, redwood.....	204
Roto hammer, rental.....	326	Ryegrass seeding.....	624	Saws, rental.....	328
Rototilling.....	187			wood.....	328
Rough carpentry adhesive.....	18	S		SBS	
anchors.....	58	S4S molding.....	225	roll roofing.....	257
backing and nailers.....	47	Sack concrete.....	365	starter strip.....	258
beams.....	45	Sack finish.....	95	Scaffolding caster-mounted, purchase.....	330
blocking.....	41	Saddle stock.....	268	erection.....	329
bracing.....	44	Saddle threshold.....	286	jacks.....	356
cant strips.....	50	Safe deposit boxes.....	453	nails.....	231
ceiling joists.....	46	Safes floor.....	452	planks, purchase.....	330
collar beams.....	48	recessed wall and floor.....	452	rental.....	329
collar ties.....	48	residential.....	262, 263	safety equipment, purchase.....	330
columns.....	39	roof.....	404	swinging, purchase.....	330
columns, steel.....	57	Safety child seat.....	447	Scaffolding, mobile rental.....	329
curbs.....	48	floor tiles.....	432	Scales, truck.....	452
demolition.....	103, 334	glass.....	166, 422	ScapeWel window.....	305
door openings.....	43	ground, electrical receptacle.....	563	Schedule 40 PVC pipe.....	506
dormer studs.....	48	nets for scaffolding.....	329	Schedule 80 PVC pipe.....	506
fascia.....	49	overhead.....	310	Scheduling costs.....	311
fireblocks.....	45	pan, water heater.....	526	CPM.....	134, 311
floor joists.....	40	signs.....	442	fees.....	134, 311
floor trusses.....	41	switch.....	568, 569	overhead.....	310
furring.....	50	switch conduit hub.....	569	School equipment.....	458, 467
girders.....	40	Safety film, window.....	419	School network.....	459
grounds (stucco stop)....	51	Sag rods, steel.....	383	Scissor lifts.....	451
joists.....	46	Salamanders, rental.....	326	Scissor lifts, rental.....	324
ledgers and ribbons.....	47	Salaries, overhead.....	310	Scoreboards, gym.....	464
plates.....	42, 67	Sales tax excluded.....	3	Scoring concrete.....	356
posts.....	39, 45	Saltillo.....	288	Scrapers excavation.....	601
purlins.....	48	Salvage, demolition.....	337	rental.....	323
rafters.....	47	Sampling concrete.....	315	Scraping metal to prepare for painting.....	436
ribbons.....	47	Sand.....	94	Scraping, paint.....	239
roof decking.....	50	base.....	614	Scratch coat, plaster.....	244, 427
roof sheathing.....	49	base for concrete.....	94	Screed concrete.....	362
roof trusses.....	48, 49	bed, paving.....	243	concrete, rental.....	322
sill plates.....	40, 57	fill.....	94, 135, 339	lath.....	188
stucco stop (grounds)....	51	fill, drainage systems.....	126	plaster or stucco.....	51
subflooring.....	42	paving.....	614	rental.....	322
trimmers.....	48	testing.....	317	tilt-up.....	362
wall sheathing.....	51	Sandbags.....	604	Screen	
window openings.....	44	Sandblasting			
Rough hardware.....	159				
Rough hardware, plywood clips....	162				
Rough-in bathtub.....	531				
drinking fountain.....	531				
floor drain.....	532				
lavatories.....	531				
service sink.....	531				
shower.....	531				
sink.....	531				
toilet.....	530				
urinal.....	530, 531				

systems	589, 591	adhesive	18	door	52	insulated	401
Security doors	113, 115	board	42, 51	shingles	259	lap	201, 274
Sediment control	604	carpentry	62	stool	53	log cabin	200, 201
Sediment fence	604	carpentry piecework rates	76	stud	52	Nailite	277
Seeded aggregate finish	244, 615	clips	162	Shingles		nails	231
Seedling		cork	435	algae-resistant	258	OSB	275
grass	624	demolition	102, 335	asphalt	255, 258	paint preparation	239
landscaping	187, 624	Dens Glass	182	cedar	259	paint removal	233
Seekure paper	28	floor	34, 38	demolition	102, 336	painting	240, 437, 438
Seesaws	468	framing, steel	74	flashing	267, 268	pine	199, 200
See-thru frames	418	gypsum board	168	hip and ridge	258	plywood	203, 275
Seismic ties	161	insulated	182	lamine	258	redwood	199
Self-leveling compound	154	insulation board	182, 399	painting	438	resin	277
Self-storing storm doors	114	lumber	392	removal	336	sealant	78
Self-tapping screws	150	OSB	42, 51, 391	roofing	258, 259	shingle	276
SensAire wall control switch	141	paper	27	siding	276	soffit vents	292
Sensor cable, electric	589	piecework rates	39	slate	260	southern yellow pine	199
Sensors		plywood	42, 49, 51, 391	solar	280	thermoplastic	277
photoelectric	589	roof	49, 392, 403	starter strip	258	vinyl	276, 401
security	589	skip	395	wood	259	western red cedar	199
vibration	589	steel framing	61	wood, demolition	336	Sieve analysis, aggregate	314
Septic		wall	51	Shoe molding	222, 223	Sieve, filter sock	126, 631
sewer systems	265	wall, exterior	391	Shoe, door	286	Sight screen	615
tanks	265, 529	wall, interior	391	Shoring		Sign lighting	586
SER aluminum cable	557	wallboard	168, 293	beams	345	Sign numbers	172
Service doors	416	Sheds, storage, rental	331	concrete	605	Signage, freestanding	485
Service entrance	573	Sheepfoot roller	138	equipment rental	330	Signal cable	592
cable	557	rental	139, 321	forms	345	Signal crossing	486
cap	544	Sheet glass	166, 422	heavy duty, rental	330	Signs	
connection	129	Sheet metal	403	trench	605	architectural signage	441
switchboard	569	access doors	266	Shot fasteners	231, 390	Braille	478
temporary connection	318	ducts	177	Shovels, earthwork	135	directory	441
weatherproof	570	flashing	260, 267	Shower		display	441
wire	557	gutters, downspouts	167	caulk	78	elevator plates	479
Service sinks	248, 534	hoods	270	compartments	442, 533	handicapped	478
rough-in	531	roofing	260, 403	doors	271, 442	job-type	318
Service station		siding	276, 401	emergency	531, 534	reflector	617
air and water	450	vents	406	enclosures	272	road closed	22
cash box	450	Sheet metal worker, wage		grab bars	246	safety	318
equipment	449	industrial & commercial	309	handicapped access	246	street numbers	172
hydraulic hoist	450	residential	10	mortar bed	272	temporary	310
submerged turbine	449	Sheet piling	605	plumbing	533	traffic	617
turbine	449	Sheet vinyl flooring	153, 431	receptors	272, 443, 533	Silestone countertop	96
Serving fixtures	453	adhesive	154	rod	24, 446	Silicon carbide, sidewalk grits	356
Serving table, sushi	454	leveling compound	154	rough-in	531	Silicon roofing	257
Settlement testing	279	Sheetrock		seat	25	Silicone caulk	78, 410, 411
SEU copper cable	557	gypsum drywall	168, 293, 423	stalls	246, 272, 443, 533	Sill	
Sewage		painting	238, 241	stalls, cleaning	83	anchors	161
ejectors	265, 528	wallboard	168, 293, 423	Shrubs	625	blocks	378
Leaks	266	Sheets		Shunt trip	571	bolted	390
pumps	265	cork	435	Shutters		carpentry	389
Sewer		polycarbonate	423	accordion-type	273	cover, aluminum	286
connection	266	polyethylene	253	Bahama-type	273	log	193
demolition	333	roofing	260	colonial-type	273	mud	161
pipe, PVC	630	Shelf lighting	191	co-polymer	272	oak	286
pump systems, residential	265	Shelf, glass	270	exterior	273	plate gasket	182
snakes, rental	328	Shellac		hurricane	273	plates	40, 57, 192
systems	265	floor finish	56	louvered	272	sealer	182
tanks	265	thinner	238	panel-type	273	steel	387
Sewer lines	266	Shelters		plywood	274	window	296
cleaning	630	bus stop	479	roll-up	273	Sill Seal™	182
demolition	333	Shelters, prefabricated metal	480	Siamese connection	493	Silt fence	150
Shacks, storage, rental	330	Shelves		Sidelites		Simco walk top	243
Shades, window	296	bathroom	446	steel door	111	Simpson hangers	159
Shaft drilling, caisson		carpentry	55	Sidewalks		Single-family home costs	306
foundations	608	closets	270	asphalt	615	Single-hung windows	
Shaft walls	427	industrial	448	concrete	84, 94, 244, 611	aluminum	301
Shake felt	259	library	448, 472	cover	331	vinyl	297
Shakertown siding	276	linen cabinet	270	demolition	100, 101, 332	Sinkers, nails	228
Shakes, roofing	259	storage	270	moving	490	Sinks	
Shale, excavation	596, 601	toilet	442	Siding		bar	247
Shaping slopes by hand	136	utility	270	aluminum	276, 401	bases	290
She bolts	355	wire	270	cedar	199	bathroom	247, 533
Shear gate	627	Shelving		corrugated	276, 401	cabinets	29, 290, 473
Shear panels		convenience store	485	demolition	102	cabinets, cutout	31
piecework rates	38	display	485	exterior trim	275	caulk	78
steel framing	74	glass	270	fascia	275	demolition	337
Sheathing		library	459	fiber cement	274	food service	457
		wire	270	galvanized steel	276	kitchen	248, 457, 531, 534
		Shims		hardboard lap	275	laundry	248
				hardboard panel	274	marble	208
				Hardi products	274	mop	457, 534

scullery	457	Snow-melting cable	476, 561	decking	198	Square molding.....	225
service	248, 534	Soap dishes	24	flooring	197	Stabilization fabric	603, 604
wash.....	531, 535	ceramic	288	lumber	195	Stack, exhaust.....	581
Siphon breaker, irrigation.....	189	commercial	445	posts	205	Stadium seating	474
Site work		installation	446	pressure-treated	202	Stage	
clearing	594	Soap dispensers	445	siding	199	HVAC.....	464
grading	596	demolition	337	timbers	202	lighting.....	463
utilities, accessories.....	638	Soccer goals	465	Spa enclosure	167	sound system	463
water meters	312	Social Security payroll taxes	285	Space frame steel	384	Stage curtains	462
Sizing	293	Sod	187, 624, 625	Spackle	238	drawing equipment	463
Skid steer loaders, rental	323	Sod cutters, rental.....	327	Spades, clay, rental	320	lift equipment	463
Skid strips, stair.....	283	Sodium lamp, high-pressure	586	Spandrel glass	419, 422	Stain	
Skip sheathing	395	Soffit		Spanish tile roofing	261	concrete	235
Skiploader, rental	323	demolition	102	Spar varnish	236	deck	98
Skirtboard, carpentry.....	56	forms	346	Spark arrestor.....	152	paint	237
Skylights		Hardie cement fiber	274	Special Construction		tinting	237
fixed.....	278	OSB	275	disabled access	476	wood finish.....	236
operable.....	278	plaster	244	Specialties	440	Stained glass.....	470
polycarbonate	277	steel	67	Specialty lumber	205	Staining	240, 241
roof windows.....	279	systems	279	Specific gravity	314	floor	156
trimmers	48, 71	vents	292	Specifications fee	314	Stairlifts	133
Velux	277	vinyl	279	Speed bumps		Stairs	
Slab doors	107, 115, 116	wood	46	asphalt	610	aluminum	282
Slab-on-grade, concrete	94, 352	Softball, backstops	618	plastic	617	attic	284
Slabs		Softener, plumbing fixtures	250	Speed limit signs	617	baluster	56
base	94	Software, project scheduling	311	Spheres, painting	437	basement	23, 281
capillary fill	339	Softwood		Spikes	231	box	281
cast-in-place	369	flooring	156	Spiral		curved	281
concrete	84, 352	plywood	202	stairs, steel	385	disappearing	284
demolition	336	Soil		Spiral staircases	282	factory-cut	281
edge forms	89	amendments	622	Spirals, reinforcing	349	framing, piecework rates	38
finishes	95	cement treatment	603	Splash plate	255	handrails	56
floor	352	compaction	597, 599	Splices, piles	608	hardwood	281
form, concrete	88	covers	603	Splicing bars	348	log	193
forms	340	hauling	600	Split-face block	215, 379	L-shaped	283
forms, elevated	345	loading	600	Split-rail fence	148	moving	490
grading	339	moving by hand	602	Split-rib block	379	nosing, bamboo	158
membrane	94, 339	poisoning	280	Split-ring connectors	163	rail	283
rebar	90	sealant	603	Splitting rock	596	railing	281
sand fill	339	spreading	597	Split-wired outlets	129	risers	56, 283
tennis court	466	stabilization	603	Spotlight, fresnel	463	skirtboard	56
Slag		testing	26, 279	Spray heads		spiral	282
crushed	126	treatments	280	sprinkler	621	spiral, steel	385
stone	18, 126	Soil pipe adapter	516	Spray painting	238	steel	282
Slate		Solar		deck	437	straight	281
pavers	382	barricade light	22	metals	437	strips, anti-skid	283
paving	614	collector system pump	528	steel	436	treads	56, 283
roofing	260, 261	electrical systems	280	Sprayed		wood	281
tile	287	paneling	280	fireproofing	409	Stakes	
Slate roofing		power	582	polyurethane insulation	184	form	205
demolition	102	power generating	280	urethane insulation	184	foundation	205
Sleepers, carpentry	51	protection	471	Sprayers, paint	239	steel	86
Sleeves, concrete	355	screen	264	rental	328	survey	205
Slicer, bread	456	shingles	280	Spread footings	377	Stalls, shower	246, 272
Slide bolt lock	165	water heating system	528	Spreading soil	597	Stamped concrete	96
Slides, playground	468	water storage tank	528	Spreading soil by hand	136	Standard brick	209
Sliding doors		Solar Tek	291	Springig	625	Standpipe connection	493
aluminum	121	Solar window film	419	Spring bronze	294	Stands, water heater	526
closers	105	Solariums	481	Sprinkler fitter, wage	309	Staplers, rental	327
fire	415, 416	Solenoid sprinkler valve	189	Sprinkler system	188	Staples, roofing	231
glass	417	Solid core doors		control	189	Starter strip	
glass, insulated	417	entry	107	Sprinklers		aluminum siding	276
patio	121	hardboard interior	116	automatic	189	galvanized flashing	268
pet door	123	lauan exterior	106	components	492, 493	shingles	258
screen	121	prehung exterior	110	connection	493	thermoplastic siding	277
vinyl	121	steel	106	control wiring	189	vinyl siding	276
wood	121	Sonotube forms	344, 365	fire	150	Starter switches	567
Sliding windows	298, 302	Sound board	399	heads	492, 621	Starters, motor	567
Slip-formed walls	353	Sound control	183	lawn	619	State cost adjustments	12–15
Slop sink rough-in	531	Sound insulation board	182	pop-up heads	189	Stationary bicycle	465
Slope protection	604	Sound reduction paneling	464	subcontract	491	Steam	
Slopes, shaping, by hand	136	Sound survey	134	trenching by hand	188	baseboard radiation	538
Slump block	216	Sound system, stage	463	valves	189	bath generator wiring	128
Slurry seal	611	Soundness testing	314	wall hydrants	493	bath, generators	285
Small tool cost	310	Soundproofing fabric	471	Sprinkling, water for excavation	138	cleaning	436
Smart Panel siding	275	Southern pine		Spruce		cleaning, masonry	371
Smoke detectors	128, 264	fence	147, 148	condensate pipe	494	condensate pipe	494
Smoke vents	407	lumber	195, 196	generators	285	generators	285
Snakes (sewer), rental	328	pressure-treated	202	heating	538	Steam meter	524
Snap ties	86, 355	siding	203	Steamers, food service	454	Steamers, wallpaper, rental	328
Snow block	193	timber	202	Square foot costs, homes	306–7		

Steel	
blocking	61
buildings	483
conduit, flexible	552
conduit, rigid	543
cutting and drilling	388
doors	106
exterior walls	63
floor joists	58
flooring	434
framing	56
framing, rule of thumb	57
landings	385
lath	188
lintels	387
masonry	215
mesh	91, 349
mesh reinforcing	349
mini-mat reinforcing	349
ornamental	388
painted	388
painting	436
panel roofing	260
piles	608
pipe, black	494
pipe, carbon	494
plate cutting	334
railing	253, 386
reinforcing	89, 346
reinforcing, epoxy	346
reinforcing, foundation	346
reinforcing, masonry	372
rod	161
roof deck	384
roof framing	74
sag rods	383
sandblasting	263
security gratings	388
shoring	605
stairs	282
stairs, spiral	385
stringers	385
structural, fabrication	383
testing	317
threaded rod	161
tilt-up	364
welded wire	346
welding	389
Steel doors	
entry	112
exterior	110, 111
fire-rated	109
garage	164
patio	121
prehung	414
screen	113
fire-rated	109
Steel framing	
anchors	58
backing for drywall	69
beams	60
blocking	61
bracing	67
ceilings	67
collar beams	72
door opening	65
dormer studs	71
fascia, piecwork	76
floor joists	58
girders	60
joists, ceiling	67
joists, piecwork	73
lally columns	57
layout, piecwork	73
piecwork	73
purlins	72
rafters	70
rafters, piecwork	74
ridgeboard	72
rule of thumb	56, 57
sheathing, piecwork	74, 76
square foot costs	57
studs	62
subflooring	61
trimmers	71
trusses	72, 73
trusses, piecwork	74
wall plates	67
walls, piecwork	73
window opening	66
Steel road plate, rental	325
Steeple	485
Stem wall	93
forms	340
Stenographer	310
Step flashing	267, 268
Step lights	585
Stepping stones	187, 625
Steps	
brick	382
concrete	95, 351, 354, 360
flagstone	216
manhole	636
masonry	216
painting	241
Steps-on-grade, concrete	95, 354
Sterilization, pipe	629
Sterilizers, water	529
Stick nails	229
Stile & rail doors	117
Stirrup steel reinforcing	347
Stock room door	418
Stolons, grass	625
Stone	
aggregate	18
aggregate base	609
artificial	381
base	94
cleaning	371
countertop	96
crushed	94, 126
cut	381
masonry	216
paving	382
riprap	604
roofing	260
slag	126
slate	260
stepping	187, 625
vanity tops	97
veneer	381
veneer, manufactured	381
work	381
Stone tracking pad	604
Stool	
carpentry	226
marble	381
window	53
Stop signs	617
Stops	
door	171, 225, 420
gas	522
gravel	403
molding	108, 225
Storage	
bins	310
cabinets	473
ice	457
overhead	310
safes	262, 263
sheds	310
sheds, rental	331
shelving	448
Storefront windows	419
Store-in-Door	114
Storm doors	114, 115
full-view	114
security	115
self-storing	114
Storm drain demolition	333
Storm sewer	
cleaning	631
Storm water control	604
Storm window	304
Storm, plywood cover	274
StormGuard	27
Stoves, ovens, ranges	
electrical work	129
residential	255
Strainers	
bronze	539
hydronic	173, 539
wye-pattern	539
Strand board	203
Straps	
channel	555
conduit hanger	555
connectors	566
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
Stud grade lumber	194
Studios, radio and television	488
Studs	
carpentry	389
demolition	104
dormer	48
exterior walls	35
gable	37
interior walls	34
rule of thumb, steel framing	57
steel	62, 73
steel exterior	63
straightening	52
straps	163
wall assemblies	34
wall framing	37
walls, commercial	389
Study carrels	459
Stump grinders, rental	327
Stump removal	138, 594
Stundi-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
surface preparation	239
well drilling	295
Subcontract costs defined	5
Subcontractor markup	5
Subflooring	
2-4-1	203
adhesive	18
board	61
engineered	42
floating	42
installation	42, 61
log homes	192
OSB	42, 62
piececwork rates	42
plywood	42, 61
Stundi-Floor	203
underlayment	203
Sub-panel connections	129
Subsurface exploration	279
Subway platform	487
Sump pumps	129, 528
Sumps, roof	406
Sun control blinds	296
Sun porch	167
Sun screens	388
Sunlamps, wiring	128
Sunrooms	481
Super Jumbo Tex	27
Super Tuff-R	399
Superintendent	310, 314
Supervision costs	314
Supervision costs excluded	4
Supply valve	522
Supports	
conduit	554
fabricated metal	387
PVC	551
Surface duct, electric	556
Surface preparation	
....	233, 234, 239, 435, 437, 439
Surgeons' scrub sink	535
rough-in	531
Surveillance	
camera	453
park	486
Survey	
building layout	595
Survey stakes	205
Surveying	313
aerial	313
periodic	318
Sushi serving table	454
Suspended ceiling	79, 429
demolition	100, 336
grid systems	79, 429
light fixtures	80
panels	81, 430
T-bar grid	429
tile	430
Suspension grid, ceiling	79
Sweep pavement	612
Sweep, door bottom	287
Sweeper, rental	325
Swimming pool	
complete installation	475
cover	476
enclosures	481
fences	150

gunite	357	Taxable fringe benefits	26
heaters, solar	250	industrial & commercial	309
paint	237, 438	residential	10
resurfacing	369	Taxes and insurance	285, 310
Swing check valves	521	Taxes included	4
Swing gates, aluminum	165	Taxes, labor cost	309
Swinging stage scaffold, purchase	330	industrial & commercial	309
Swings, playground	468	residential	10
Switch box, electric	562	Teak parquet	158
circuits	575	Tear-off roofing, demolition	402
plates	23	Tech support	5
Switch cover plate	565	Technical services	317
Switchboards	570	Techwall wall cladding	400
accessories	571	Tectum	402
instrumentation	571	Tees	
meters	571	ABS cleanout	515
transformers	571	ABS sanitary	514
weatherproof	570	black steel	494
Switches		copper	504
dimmer	564	copper DWV	512
dimmer, fluorescent	564	CPVC	507
disconnect	577	PVC	506
electric	129	test	515
electrical	564	Wisconsin	514
exhaust fan	141	Telephone	
fan control	141	outlets	591
motor	567	wiring	591
power distribution	570	Telephone assistance	5
safety	568, 569	Telescoping doors	417
security	589	Television	
starter	568	closed circuit	592
timer, exhaust fan	141	educational	458
wiring	129	equipment	458
Swivel ring hangers, pipe	517	outlets	592
Symbols		pipe inspection	637
lettering	467	studio	488
Synthetic surface playing fields	465	systems	592
wiring	129	Teller	
		automatic	452
		counter	452
		window	453
		Temperature gauge	524
		Tempering valves	540
		Temporary	
		enclosures	331
		fence	331
		jackposts	186
		services	310
		structures	480
		structures, rental	330
		utilities	318
		wall bracing	44, 67
		Tennis courts	
		enclosures	481
		installation	466
		striping	466
		windbreak panels	466
		Tension	
		bridging	159
		Termite shield	268
		Termite treatment	207, 280
		Terra cotta, demolition	335
		Terrazzo	
		demolition	336
		pavers	382
		tile	382, 433
		Test caps, plugs, and tees, ABS	515
		Testing	
		acoustical	134
		aggregate	314
		asbestos	26
		asphalt	315
		brick	316
		building stone	316
		cable	130
		concrete	315
		fees	317
		gunite	316
		hazards	26
		home	26
		masonry	316
		network cable	460
		noise	134
		percolation	265
		piles	606
		soil	26, 265, 279, 314
		sound transmission	134
		steel	317
		thermal	184
		water	26
		Tetherball post	468
		Textolite countertops	96
		Texture	
		popcorn ceiling	169
		Texture 1-11	203
		Texture, drywall	169
		Textured wallboard	424
		Theater	
		curtains	462
		seating	474
		Thermal	
		analysis	184
		expansion tank	249
		insulation	398
		mitigation	471
		Thermal and Moisture Protection	397
		Thermoflow indicator	524
		Thermography	184
		Thermometer, steam	524
		Thermoplastic	
		siding	277
		tape	467
		Thermostat	176
		Thermostatic	
		mixing valves	540
		traps	540
		water heaters	527
		THHN wire	558
		Thinline glass block	218
		Thinner	238
		Thompson's WaterSeal	236
		Threaded	
		black steel pipe	494
		carbon steel pipe	494
		Threaded rod	161
		Thresholds	
		aluminum	285
		bamboo	158
		high boy	108
		inserts	286
		marble	381
		wood	222
		Thrust blocks, concrete	627
		Thru-the-wall utility fan	140
		THWN wire	558
		Ticket boxes	452
		Ticket dispenser	450
		Tie straps	163
		Tie wire	219
		Tier IV EPA pollution control rating	581
		Ties	
		brick wall	219
		collar	48
		concrete	355
		concrete form	86, 355
		form	86, 339
		hurricane	161
		seismic	161
		wall, brick	159
		wall, masonry	210, 372
		Tile	
		acoustical facing	374
		backer board	290
		ceiling	82, 430
		ceramic	374, 427
		clay	374
		concrete roof	261
		decorative	288
		demolition	101, 102, 336
		epoxy bed	382
		floor	287
		glazed	374
		installation	288, 289
		marble	208
		masonry	220
		porcelain	287
		quarry	381, 429
		resilient	432
		roller, rental	326
		roofing	261
		rubber	432
		rubber studded	154
		saws, rental	328
		security, glazed	374
		shock-absorbing	432
		simulated roofing	260
		structural facing	374
		vinyl floor	153, 154
		wall	287
		Tile layer, wage	
		industrial & commercial	309
		residential	10
		Tillers, rental	327
		Tilt double-hung window	303
		Tilt-up concrete	360
		Tilt-up construction	362
		panels, sandblasting	263
		pillars	362
		Tilt-up painting	437
		Timbers	
		Douglas fir	201
		hardwood	396
		laminated	396
		lumber	197, 201
		pine	202
		rafter	193
		redwood	201
		treatments	206
		wood	396
		Timekeeper costs	314
		Timer switches	141, 564
		15 minute	564
		Tin	
		ceilings	82
		shingles	268
		Tint	
		paint	237
		wood finish	236
		Tint, window	419
		Tire changer	450
		Tissue holder	24, 445
		TJI truss joists	41, 395
		Toaster, conveyor type	456
		Toggle switch	565, 568
		Toilets	247, 532
		accessories	24, 445
		augers, rental	328
		compartments	442
		flush valves	532
		jobsite	310
		partition, handicapped	478
		partitions, demolition	337
		rough-in	530
		temporary	310, 319
		trailer-mounted	319
		Tongue and groove	
		flooring	155
		insulation board	181
		sheathing	51
		siding	199
		Tool sheds, rental	331
		Tools available	4
		Tools, rental	320
		Toothbrush holders	
		ceramic tile	288
		residential	23
		Topping, concrete	95, 356

Topsoil	.....	588
excavation, by hand.....	136	
placement.....	187	
strip.....	595	
Torch cutting.....	334	
Total column defined.....	5	
Total expense, overhead.....	310	
Towel	.....	312
bars.....	445	
dispensers.....	445	
racks.....	24	
Towers	.....	30
fire pole, playground.....	469	
lifting.....	319	
Toxic chemicals, removal.....	435	
Track	.....	139
railroad, demolition.....	334	
rolling ladder.....	459	
stage curtain.....	462	
Tracking pad, stone.....	604	
Tractor	.....	270
demolition.....	335	
excavation.....	596, 601	
finish shaping.....	597	
ripping rock.....	596	
rock fill.....	604	
site clearing.....	594	
site grading.....	596	
Tractor operator, wage	.....	141
industrial & commercial.....	309	
Traffic	.....	22
cones.....	22	
control equipment rental.....	326	
control signage.....	318	
light.....	486	
paint.....	237	
pavement marking.....	616	
signs.....	617	
stripes.....	616	
symbols.....	616	
Trampoline.....	465	
Transaction	.....	173
window.....	453	
Transformers.....	538	
indoor.....	572	
pole mount.....	572	
potential, switchboard.....	571	
switchboard.....	571	
Transit levels, rental.....	327	
Transit mix concrete.....	84	
Transom lite.....	414	
Trap adapter	.....	180
ABS.....	516	
copper.....	512	
Traps	.....	181
float.....	540	
thermostatic.....	540	
Trash	.....	182
bins.....	332	
chutes.....	337, 491	
enclosure, tilt-up.....	366	
removal.....	310	
Trash compactor wiring.....	130	
Trash pumps, rental.....	324	
Travertine tile.....	287	
Treadmill.....	465	
Treads.....	220	
carpentry.....	56	
concrete, finishing.....	356	
flagstone.....	216	
marble.....	381	
rubber.....	220	
stair.....	283	
wood.....	281, 397	
Treated lumber.....	201	
Treating	.....	202
lumber.....	207	
poles.....	204	
soil.....	280	
wood.....	207	
Treatment	.....	207
fire retardant.....	207	
soil poisoning.....	280	
Tree clearing.....	138, 594	
Tree grates.....	626	
Trees	.....	505
costs.....	625	
planting.....	624	
Trench	.....	266
braces, rental.....	323	
covers.....	385	
frame.....	637	
inlets.....	637	
shaping.....	597, 602	
sheeting.....	605	
shields, rental.....	323	
shoring.....	605	
sprinkler pipe.....	619	
Trench plate, steel.....	325	
Trenchers, rental.....	139, 323	
Trenching.....	597	
backhoe.....	597	
concrete.....	338	
excavation.....	136, 597	
hand.....	136, 602	
hand work.....	339	
rock.....	597	
sprinkler systems.....	188	
Tri-Flex 30.....	27	
Trim	.....	455
carpentry.....	226	
door.....	53, 222	
fireplace.....	55	
hardwood.....	222	
molding.....	226	
OSB siding.....	275	
painting.....	238, 240	
pine.....	226	
redwood.....	222	
softwood.....	223	
stair.....	56	
steel panel roofing.....	260	
wallboard.....	169	
window.....	53	
Trim coil.....	267	
Trimmers	.....	590
carpentry.....	48	
steel (framing).....	71	
Trimming, trench bottom.....	136	
Triple-track storm doors.....	114	
Troffer lighting fixtures.....	80, 190, 583	
Trowel finishing, concrete.....	95, 356	
Troweling machine, rental.....	321	
Trowel-ready mortar.....	219	
Trowels, rental.....	321	
Truck	.....	557
bumpers.....	365	
concrete.....	350	
cranes, rental.....	319	
excavation.....	138	
hauling.....	600	
loading by hand.....	135	
rental.....	139, 324	
scales.....	452	
superintendent's.....	310	
water, rental.....	325	
Truck driver, wage	.....	203, 262, 432
industrial & commercial.....	309	
residential.....	10	
Trusses	.....	465
fink.....	49, 72	
gable.....	49, 73	
joists.....	395	
log.....	193	
roof.....	48, 72, 395	
roof, piecework.....	38	
roof, piecework rates.....	74	
steel.....	383	
Truss-type reinforcing.....	372	
Tub	.....	473
sealant.....	79	
whirlpool bath.....	245	
Tube	.....	588
columns, steel.....	384	
nosing.....	387	
pneumatic.....	491	
Tubing	.....	268
copper.....	505	
electric metallic.....	544	
strap, CPVC.....	508	
Tubs	.....	628
access doors.....	266	
caulk strips.....	79	
caulking.....	78	
enclosures.....	272	
plumbing.....	245, 531, 533	
Tuck pointing.....	371	
Tuff-R insulation.....	182	
Tung oil wood finish.....	236	
Turbines.....	579	
additional costs.....	580	
fans.....	407	
service station.....	449	
vents.....	292	
vents, roof.....	141	
Turf	.....	290
artificial grass.....	465	
playing fields, grass and	465	
synthetic.....	465	
replacing.....	619, 624	
Turfstone	.....	270
grass paving.....	615	
Turnstiles.....	452, 487	
Turpentine.....	238	
Twinaxial cable.....	593	
Twist straps.....	164	
Type K copper pipe.....	503, 504	
Type L copper pipe.....	503	
Tyvek.....	28, 183	
U	.....	184
U bolts.....	518	
Ultra Touch.....	183	
Ultrasonic sensors and	590	
transceivers.....	590	
Ultraviolet sterilizers, water.....	529	
Underfloor duct.....	557	
Underground	.....	558
communication.....	541	
duct.....	541	
power.....	541	
Underlayment.....	203, 262, 432	
floor.....	34	
particleboard.....	395	
piecework rates.....	38, 74	
roof.....	27	
tile backer board.....	290	
Underpinning, shoring.....	605	
Unions	.....	559
black steel.....	494	
CPVC.....	507	
particleboard.....	395	
piecework rates.....	38, 74	
roof.....	27	
tile backer board.....	290	
Unistrut inserts.....	355	
Unit heaters.....	535, 538	
Uniturf.....	465	
Unusual labor productivity.....	4	
URD wire.....	558	
Urethane	.....	560
exterior finish.....	236	
floor finish.....	56	
insulation.....	184	
sealer.....	155	
sheathing.....	182	
Urinal	.....	561
bar.....	446	
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	.....	626
overhead.....	310	
sewer connections.....	266	
sitework piping.....	628	
temporary.....	318	
water.....	312	
Utility	.....	627
cabinets.....	30	
fan.....	139, 140	
piping, sitework.....	628	
shelving, wood.....	270	
sinks, food service.....	457	
V	.....	628
Vacation costs included.....	3	
Vac-jet pipe cleaning.....	631	
Vac-jetter	.....	631
cleaning.....	631	
Vacuum breaker	.....	631
anti-siphon.....	173	
atmospheric.....	538	
controllers.....	618	
valves.....	618	
Vacuum systems.....	290	
wiring.....	130	
Vacuum, wet/dry, rental.....	326	
Valance	.....	326
cabinet.....	31	
lighting.....	190	
Valley flashing.....	403	
Valuation fees.....	18	
Valuation, buildings.....	18	
ValueTest bath fan.....	140	
Valve box.....	221, 619	
Valves	.....	619
angle.....	522	
backflow.....	312, 522	
ball.....	522	
check.....	627	
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	
stop.....	522	
supply.....	522	
tapping.....	627	
tempering.....	540	
thermostatic mixing.....	173	
water control.....	523	
Vanity	.....	620
bases.....	290	
mirrors.....	221	
Vanity tops	.....	620
Corian.....	97	
cultured stone.....	97	
marble.....	97	
Vapor barriers	.....	620
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
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
Ventlite 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
softit	292
turbine	292
Vermiculite	
insulation	183, 399
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
softit 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
jalouse	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
W	
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
assemblies, interior	34
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	62, 63, 73
jointing	357
painting	238, 437
panel systems	394
piecework rates, framing	73
plates	42, 67
protection systems	444
reinforcing	372
safes	262, 452
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	
commercial	532
demolition	478
installation	478
residential	247
rough-in	530
Water heater	
accessories	526
leak detection	527
tankless	249
Water heaters	
assemblies	527
commercial	526
connections	527
earthquake restraints	527
electric	249, 527
gas	248
instantaneous	527
overflow pans	526
propane	249
residential	249
safety pans	526
solar	249, 528
stands	526
wiring	130
Water meter	524
Water table	
flashing	268
molding	222, 224
Water-based stain	236
Waterblasting	239, 371
Watering	
embankment grading	597
landscaping	621
sprinkler systems	621
trenching	619
Waterproof adhesive	18
Waterproofing	294
acrylic	184
asphalt	397
building	382
concrete	294, 339
insulation	184
masonry	218, 235, 294
membrane	397
multi-surface	237
paper	27
slab	339
walkways	294
wood finish	236
WaterSeal wood sealer	236
Waterstop, concrete	91, 349
Watthmeter	571
Waxing	
concrete	356
floors	238, 431
woodwork	241
Weather vanes	97
Weatherproof	
service entrance	570
switchboards	570
Weatherproofing	27
wood finish	236
Weatherstripping	294, 421
Wedge tie, concrete form	355
Wedges	205
Weed eaters, rental	327
Weight room	465

Welded	
black steel pipe	494
carbon steel pipe	494
mesh	91
wire mesh	349
Welding	
grounding	565
machines, rental	329
rebar	348
steel	389
tilt-up	364
Weld-o-lets	499
Welfare costs included	3
Well drilling, subcontract	295
Wellpoint dewatering	602
Wenge cabinets	472
West coast fir lumber	194, 196
Western red cedar siding	199
Wet paint barricade	23
Wet patch roof cement	256, 257
Wet sandblasting	263
Wheel corner guards	387
Wheel loaders	598
rental	138, 139
Wheelbarrow	
hauling debris	337
hauling soil	602
Wheelbarrows, rental	327
Wheelchair	
lifts	133
ramp	476
swing platform	468
Whirlpool bathtubs	245
wiring	128
White board	440
White cement	82, 427, 433
White roof coating	257
Whiteboard (chalkboard)	440
Whitewash stain	237
Whole house fans	141
Wilsonart countertops	96
Wind clips	262
Wind turbines	132
Windbreak, tennis	466
Window	
plywood cover	274
removal	103
teller	453
transaction	453
Window air conditioners	177
Window wells	305
Window, safety film	419
Window, tint film	419
Windows	
aluminum single-hung	301
aluminum sliding	302
apron	53
architectural	419
awning	21, 300
awning, aluminum	302
Wingwall	638
bank	452
basement	301
bay	299
blinds	272
bow, wood	304
casement	299, 300, 301
casing	54
caulking	78
circular, vinyl	299
cleaning	83, 331
coverings	273
double-hung	303
fixed	299
frames, paint removal	233
framing	44
framing, steel	66
garden	299
glass	166
grating	388
impact	301
jalousie	299
mantels	295
octagonal	303
paint preparation	239
painting	238, 239, 241
partition	443
picture	299
reglazing	239
removal	337
roof	279, 304
screen	300
seals	294
security grill	485
shades	296
sills	296
skylights	277
steel	419
stool, marble	381
stool, MDF	226
stool, wood	226
storm	304
teller	452
treatment	296
trim	53, 226
vinyl	297, 298, 299, 300
vinyl bay	299
vinyl casement	299
vinyl double-hung	297, 298
vinyl garden	299
vinyl hopper	300
vinyl jalousie	299
vinyl picture	299
vinyl single-hung	297
vinyl sliding	298
vinyl-clad awning	300
vinyl-clad basement	301
vinyl-clad casement	300, 301
vinyl-clad wood	300, 301
wall	422
weatherstripping	294
wood	419
Wiping stain	237
Wire	
aluminum SER	557
building	127
copper	558
copper SEU	557
electric	127
ground	558
lath	188
partitions	444
Romex	559
screen	264
service entrance	129, 557
shelving	270
sprinkler	620
THHN, copper	558
URD	558
USE	558
XHHW, copper	559
Wire brush	
finish	95
painting	439
Wire glass	418
Wire mesh	91
fence	143
gunite	357
reinforcing	191
Wireless access points	130, 460
Wiremold raceway	556
Wireway, electrical	556
Wiring	
alarms	264
campus network	459
computer	130, 459
control wiring	189
controllers	189
doorbell	105
educational network	459
electric	127
fence, electric	144
irrigation controls	189
landscape sprinklers	189
phones	591
systems	591
telephone	591
twisted pair	591
Wisconsin tee	514
Wolmanized lumber	207
Wonderboard tile backer	290
Wood	
fences	148
filler	238
finishes	236
floor finishing	56, 430
flooring	55, 155, 430
flooring adhesive	159
lumber	207
paint preparation	239
piles	606
preservative	207, 237
roofing	259
sealer	236
shingles	259
stain	236
treatment, lumber	207
waterproofing	236
Wood and composites	389
Wood chip mulch	187
Wood doors	
patio	121
screen	113
Woodcore storm doors	115
Woodwork	
paint preparation	239
painting	241
staining	241
waxing	241
Woodworking glue	18
Work tables	
food service	454
kitchen	454
Workers' comp insurance	185
Working conditions	4
Woven wire partitions	444
Wrecking, demolition	104
Wrenches, rental	328
Wrought iron	150
railing	386
W-valley flashing	267, 268
Wye pattern strainers	173, 539
Wyes	
ABS	514
drain pipe	126
X	
Xerographic prints	25
XHHW wire	559
X-ray	
barriers	484
lead mesh fabric	471
mobile barriers	484
protection	484
viewing panels	484
Y	
Yard	
deck	100
lighting	587
Yardarm, nautical	449
Yellow pine lumber	195
Yield signs	617
Z	
Z-bar flashing	267, 268
Z-brick	243
Zinc primers	234
Zone	
heating and cooling	178
Zone valves	492

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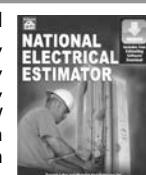
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120 pages, 6½ x 8½, \$44.95. Published by NAHB Remodelers Council

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8½ x 11, 232 pages, \$32.50

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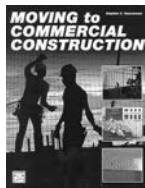
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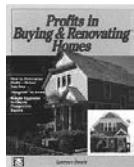


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