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2018 66th Edition

NATIONAL CONSTRUCTION ESTIMATOR

Edited by Richard Pray

SAMPLE

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This Book Is an Encyclopedia of 2018 Building Costs

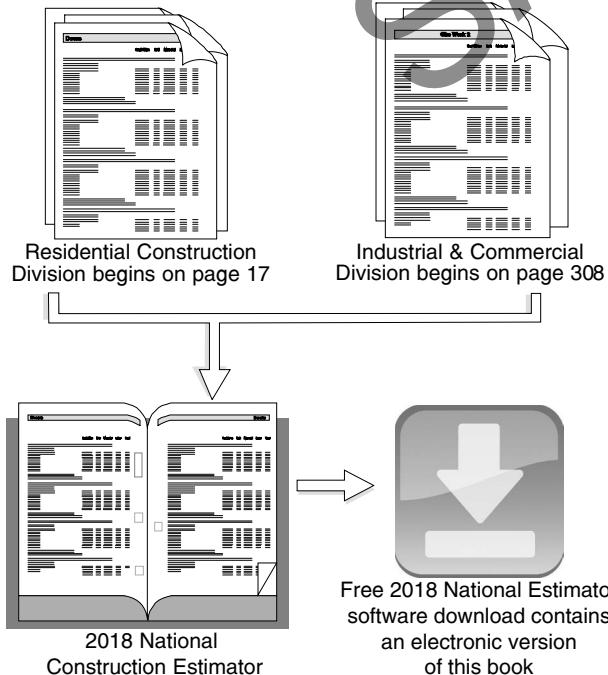
The 2018 National Construction Estimator lists estimated construction costs to general contractors performing the work with their own crews, as of mid-2018. Overhead & profit are not included.

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.

National Estimator software will run on PCs using Windows XP, Vista, 7, 8, or 10 operating systems.

When the National Estimator program has been installed, click Help on the menu bar to see a list of topics that will get you up and running. Or go online to www.craftsman-book.com, click on "Support", then 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-2018. Discounts may be available for purchases in larger volume.

Quarterly prices updates on the Web are free and automatic all during 2018. 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 2017 and projected to mid-2018 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	liquefied propane	STC	quality glass
CSF	100 square feet	LS	lump sum	Std	sound transmission class
CSY	100 square yards	M	one thousand	SY	standard
CY	cubic yard	Mb	million bytes (characters)	T	square yard
d	penny	MBF	1,000 board feet	T&G	thick
D	depth	MBtu	1,000 British thermal units	TV	tongue & groove edge
DC	direct current	MCM	1,000 circular mils	UBC	television
dia	diameter	MDO	medium density overlaid	UL	Uniform Building Code
DSB	double strength B quality glass	MH	manhour	USDA	Underwriter's Laboratory
DWV	drain, waste, vent piping	Mi	mile	VLF	United States Dept.
Ea	each	MLF	1,000 linear feet	W	of Agriculture
EMT	electric metallic tube	MPH	miles per hour	Wk	vertical linear foot
EPDM	ethylene propylene diene monomer	mm	millimeter(s)	W/	width
equip.	equipment	Mo	month	x	week
exp.	exposure	MSF	1,000 square feet		with
F	Fahrenheit	NEMA	National Electrical Manufacturer's Association		by or times
		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 \$33.44. That's the average for a residential laborer (listed at \$29.93 per hour on page 10) and a residential carpenter (listed at \$36.94 per hour): \$29.93 plus \$36.94 is \$66.87. Divide by 2 to get \$33.435, (rounded up to \$33.44), 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 \$33.44, 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	\$33.44	1 laborer and 1 carpenter	BR	\$35.45	1 lather
B2	\$34.60	1 laborer, 2 carpenters	BS	\$32.78	1 marble setter
B3	\$32.27	2 laborers, 1 carpenter	CF	\$35.03	1 cement mason
B4	\$36.96	1 laborer 1 operating engineer 1 reinforcing iron worker	CT	\$34.83	1 mosaic & terrazzo worker
B5	\$36.57	1 laborer, 1 carpenter 1 cement mason 1 operating engineer 1 reinforcing iron worker	D1	\$35.92	1 drywall installer 1 drywall taper
B6	\$32.48	1 laborer, 1 cement mason	DI	\$35.95	1 drywall installer
B7	\$30.32	1 laborer, 1 truck driver	DT	\$35.89	1 drywall taper
B8	\$36.03	1 laborer 1 operating engineer	HC	\$29.01	1 plasterer helper
B9	\$32.62	1 bricklayer 1 bricklayer's helper	OE	\$42.13	1 operating engineer
BB	\$37.47	1 bricklayer	P1	\$36.39	1 laborer, 1 plumber
BC	\$36.94	1 carpenter	PM	\$42.85	1 plumber
BE	\$40.04	1 electrician	PP	\$33.82	1 painter, 1 laborer
BF	\$33.79	1 floor layer	PR	\$36.99	1 plasterer
BG	\$35.68	1 glazier	PT	\$37.70	1 painter
BH	\$27.76	1 bricklayer's helper	R1	\$35.60	1 roofer, 1 laborer
BL	\$29.93	1 laborer	RI	\$38.83	1 reinforcing iron worker
			RR	\$41.27	1 roofer
			SW	\$41.59	1 sheet metal worker
			T1	\$32.55	1 tile layer, 1 laborer
			TL	\$35.17	1 tile layer
			TR	\$30.71	1 truck driver

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
A1	\$50.41	1 asbestos worker 1 laborer	F6	\$48.46	2 carpenters, 2 laborers 1 tractor operator
AT	\$43.50	1 air tool operator	F7	\$50.42	2 carpenters, 1 laborer 1 tractor operator
AW	\$60.17	1 asbestos worker	F8	\$51.02	2 plasterers 1 plasterer's helper
BM	\$60.87	1 boilermaker	F9	\$45.66	1 laborer, 1 floor layer
BT	\$40.82	1 bricklayer tender	FL	\$50.67	1 floor layer
C1	\$41.58	4 laborers, 1 truck driver	G1	\$47.69	1 glazier, 1 laborer
C2	\$48.86	1 laborer, 2 truck drivers 2 tractor operators	H1	\$53.72	1 carpenter, 1 laborer 1 iron worker (structural) 1 tractor operator
C3	\$47.49	1 laborer, 1 truck driver 1 tractor operator	H2	\$51.03	1 crane operator 1 truck driver
C4	\$42.20	2 laborers, 1 truck driver	H3	\$46.04	1 carpenter, 3 laborers 1 crane operator 1 truck driver
C5	\$45.78	2 laborers, 1 truck driver 1 tractor operator	H4	\$61.85	1 crane operator 6 iron workers (structural) 1 truck driver
C6	\$44.75	6 laborers, 2 truck drivers 2 tractor operators	H5	\$53.79	1 crane operator 2 iron workers (structural) 2 laborers
C7	\$47.21	2 laborers , 3 truck drivers 1 crane operator 1 tractor operator	H6	\$53.06	1 iron worker (structural) 1 laborer
C8	\$46.45	1 laborer, 1 carpenter	H7	\$62.56	1 crane operator 2 iron workers (structural)
C9	\$48.70	1 laborer, 1 crane operator	H8	\$60.65	1 crane operator 4 iron workers (structural) 1 truck driver
CB	\$53.32	1 bricklayer	H9	\$59.64	1 electrician 1 sheet metal worker
CC	\$52.25	1 carpenter	IW	\$65.46	1 iron worker (structural)
CD	\$51.53	1 drywall Installer	LA	\$47.27	1 lather
CE	\$59.50	1 electrician	M1	\$47.07	1 bricklayer 1 bricklayer's tender
CG	\$54.73	1 glazier	M2	\$44.52	1 carpenter, 2 laborers
CL	\$40.65	1 laborer	M3	\$49.44	1 plasterer 1 plasterer's helper
CM	\$50.64	1 cement mason	M4	\$47.03	1 laborer, 1 marble setter
CO	\$56.75	1 crane operator	M5	\$51.08	1 pipefitter, 1 laborer,
CV	\$56.35	1 elevator constructor	M6	\$54.11	1 asbestos worker 1 laborer, 1 pipefitter
D2	\$46.09	1 drywall installer 1 laborer	M8	\$56.30	3 pipefitters, 1 laborer
D3	\$53.06	1 laborer, 1 iron worker (structural), 1 millwright	M9	\$60.51	1 electrician, 1 pipefitter
D4	\$46.87	1 laborer, 1 millwright	MI	\$54.56	2 pipefitters, 1 laborer
D5	\$50.76	1 boilermaker, 1 laborer	MS	\$53.41	marble setter
D6	\$54.22	2 millwrights 1 tractor operator	MT	\$50.38	mosaic & terrazzo worker
D7	\$46.56	1 painter, 1 laborer	MW	\$53.08	millwright
D9	\$48.94	2 millwrights, 1 laborer			
E1	\$51.36	2 electricians, 2 laborers 1 tractor operator			
E2	\$50.08	2 electricians, 2 laborers			
E3	\$50.80	2 electricians, 2 laborers 2 carpenters			
E4	\$50.08	1 electrician, 1 laborer			
F5	\$47.61	3 carpenters, 2 laborers			

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
P5	\$44.75	3 laborers 1 tractor operator 1 truck driver	S8	\$50.32	2 pile drivers, 2 laborers 1 truck driver 1 crane operator 1 tractor operator
P6	\$51.62	1 laborer, 1 plumber	S9	\$47.86	1 pile driver, 2 laborers 1 tractor operator 1 truck driver
P8	\$45.65	1 laborer, 1 cement mason			
P9	\$47.85	1 carpenter, 1 laborer 1 cement mason			
PA	\$52.46	1 painter	SM	\$59.77	1 sheet metal worker
PD	\$56.17	1 pile driver	SP	\$63.82	1 sprinkler fitter
PF	\$61.51	1 pipefitter	SS	\$51.22	1 laborer 2 tractor operators
PH	\$44.70	1 plasterer's helper	T2	\$52.47	3 laborers, 3 carpenters 3 iron workers (structural)
PL	\$62.59	1 plumber			1 crane operator 1 truck driver
PS	\$54.18	1 plasterer	T3	\$52.52	1 laborer 1 reinforcing iron worker
R3	\$46.13	2 roofers, 1 laborer	T4	\$45.52	1 laborer, 1 mosaic worker
RB	\$64.38	1 reinforcing iron worker	T5	\$50.21	1 sheet metal worker 1 laborer
RF	\$48.87	1 roofer	T6	\$53.40	2 sheet metal workers 1 laborer
S1	\$48.58	1 laborer 1 tractor operator	TD	\$45.31	1 truck driver
S3	\$50.91	1 truck driver 1 tractor operator	TO	\$56.51	1 tractor operator
S4	\$40.65	3 laborers	U1	\$50.10	1 plumber, 2 laborers 1 tractor operator
S5	\$43.62	5 laborers 1 crane operator 1 truck driver	U2	\$47.96	1 plumber, 2 laborers
S6	\$45.94	2 laborers 1 tractor operator			
S7	\$48.58	3 laborers 3 tractor operators			

Residential Division

Craft	1 Base wage per hour	2 Taxable fringe benefits (@5.50% of base wage)	3 Insurance and employer taxes (%)	4 Insurance and employer taxes (\$)	5 Non-taxable fringe benefits (@4.86% of base wage)	6 Total hourly cost used in this book
Bricklayer	\$27.34	\$1.50	25.30%	\$7.30	\$1.33	\$37.47
Bricklayer's Helper	20.26	1.11	25.30	5.41	0.98	27.76
Building Laborer	20.67	1.14	32.66	7.12	1.00	29.93
Carpenter	25.72	1.41	31.56	8.56	1.25	36.94
Cement Mason	26.00	1.43	23.12	6.34	1.26	35.03
Drywall installer	26.60	1.46	23.53	6.60	1.29	35.95
Drywall Taper	26.55	1.46	23.53	6.59	1.29	35.89
Electrician	30.50	1.68	19.82	6.38	1.48	40.04
Floor Layer	24.95	1.37	23.79	6.26	1.21	33.79
Glazier	25.95	1.43	25.73	7.04	1.26	35.68
Lather	26.69	1.47	21.26	5.99	1.30	35.45
Marble Setter	24.67	1.36	21.34	5.55	1.20	32.78
Millwright	26.16	1.44	21.22	5.86	1.27	34.73
Mosaic & Terrazzo Worker	26.22	1.44	21.34	5.90	1.27	34.83
Operating Engineer	30.77	1.69	25.18	8.17	1.50	42.13
Painter	27.60	1.52	24.85	7.24	1.34	37.70
Plasterer	26.33	1.45	28.53	7.93	1.28	36.99
Plasterer Helper	20.65	1.14	28.53	6.22	1.00	29.01
Plumber	31.53	1.73	24.24	8.06	1.53	42.85
Reinforcing Ironworker	27.64	1.52	28.56	8.33	1.34	38.83
Roofer	26.32	1.45	44.02	12.22	1.28	41.27
Sheet Metal Worker	30.19	1.66	25.97	8.27	1.47	41.59
Sprinkler Fitter	30.98	1.70	25.05	8.19	1.51	42.38
Tile Layer	26.46	1.46	21.34	5.96	1.29	35.17
Truck Driver	22.26	1.22	26.18	6.15	1.08	30.71

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 2018.

Column 2, taxable fringe benefits, includes vacation pay, sick leave and other taxable benefits. These fringe benefits average 5.50% 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 4.86% 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:

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

Then add the regular work hours for the year:

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

Multiply these hours by the base wage per hour. If you pay carpenters \$10.00 per hour, the calculation would be:

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

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 31.56%, the rate for carpenters in column 3 on page 10. To increase the annual taxable wage by 31.56%, we'll multiply by 1.3156:

$$\begin{array}{r} \$20,800 \text{ per year} \\ \times 1.3156 \text{ tax & insurance rate} \\ \hline \$27,364 \text{ annual cost} \end{array}$$

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.

$$\begin{array}{r} \$4,124 \text{ medical plan} \\ + 27,364 \text{ annual cost} \\ \hline \$31,488 \text{ total annual cost} \end{array}$$

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:

$$\frac{\$31,488}{2,000} = \$15.74 \text{ per hour}$$

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 \$36.94.

$$\frac{\$15.74}{\$36.94} = .426$$

Your modification factor is 42.6%. Multiply any building carpenter (Craft Code BC) labor costs in the Residential Division of this book by .426 to find your estimated cost. For example, on page 24 the labor cost for installing an 18" long towel bar is \$10.30 per each bar. If installed by your carpenter working at \$10.00 per hour, your estimated cost would be 42.6% of \$10.30 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.

Alabama Average						District of Columbia Average						Florida Average					
Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
Anniston	362	-3	-13	-1	-8%	Long Beach	907-908	3	17	1	9%	Washington	200-205	3	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	-7	0	-3%	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	0	-13	0	-6%	Mojave	935	0	11	0	5%	Daytona Beach	321	-2	-18	-1	-9%
Evergreen	364	-1	-20	0	-10%	Novato	949	3	21	1	11%	Fort Lauderdale	333	3	1	1	2%
Gadsden	359	-4	-15	-1	-9%	Oakland	945-947	3	33	1	17%	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	-2	-23	-1	-12%
Alaska Average	14	32	5	22%	Salinas	939	3	-1	1	1%	Orlando	328	0	2	0	1%	
Anchorage	995	17	38	6	27%	San Bernardino	923-924	0	4	0	2%	Panama City	324	-2	-21	-1	-11%
Fairbanks	997	16	40	5	27%	San Diego	919-921	3	13	1	8%	Pensacola	325	0	-17	0	-8%
Juneau	998	18	22	6	20%	San Francisco	941	3	55	1	27%	Saint Augustine	320	-1	-4	0	-2%
Ketchikan	999	3	29	1	15%	San Jose	950-951	3	33	1	17%	Saint Cloud	347	0	-5	0	-2%
King Salmon	996	16	32	5	23%	San Mateo	943-944	4	40	1	21%	St Petersburg	337	0	-12	0	-6%
Arizona Average	1	-9	0	-4%	Santa Barbara	931	3	11	1	7%	Tallahassee	323	0	-13	0	-6%	
Chambers	865	1	-18	0	-8%	Santa Rosa	954	3	7	1	5%	Tampa	335-336	-1	-1	0	-1%
Douglas	855	0	-15	0	-7%	Stockton	952	2	7	1	4%	West Palm Beach	334	1	-5	0	-2%
Flagstaff	860	2	-18	1	-7%	Sunnyvale	940	3	39	1	20%						
Kingman	864	1	-11	0	-5%	Van Nuys	913-916	3	14	1	8%						
Mesa	852	1	5	0	3%	Whittier	906	3	14	1	8%						
Phoenix	850	1	6	0	3%	Colorado Average	2	1	1	1%							
Prescott	863	3	-16	1	-6%	Aurora	800-801	3	11	1	7%						
Show Low	859	1	-18	0	-8%	Boulder	803-804	3	5	1	4%						
Tucson	856-857	0	-10	0	-5%	Colorado Springs	808-809	2	-3	1	0%						
Yuma	853	0	5	0	2%	Denver	802	3	13	1	8%						
Arkansas Average	-2	-13	0	-7%	Durango	813	1	-3	0	-1%							
Batesville	725	0	-20	0	-9%	Fort Morgan	807	2	-6	1	-2%						
Camden	717	-3	1	-1	-1%	Glenwood Springs	816	2	6	1	4%						
Fayetteville	727	0	-8	0	-4%	Grand Junction	814-815	1	-1	0	0%						
Fort Smith	729	-1	-14	0	-7%	Greeley	806	3	8	1	5%						
Harrison	726	-1	-25	0	-12%	Longmont	805	3	2	1	3%						
Hope	718	-3	-15	-1	-8%	Pagosa Springs	811	0	-9	0	-4%						
Hot Springs	719	-2	-25	-1	-13%	Pueblo	810	-1	2	0	0%						
Jonesboro	724	-1	-18	0	-9%	Salida	812	2	-15	1	-6%						
Little Rock	720-722	-1	-6	0	-3%	Connecticut Average	1	16	0	8%							
Pine Bluff	716	-4	-19	-1	-11%	Bridgeport	066	0	13	0	6%						
Russellville	728	0	-9	0	-4%	Bristol	060	1	24	0	12%						
West Memphis	723	-3	-1	-1	-2%	Fairfield	064	2	17	1	9%						
California Average	2	12	1	7%	Hartford	061	0	23	0	11%							
Alhambra	917-918	3	15	1	8%	New Haven	065	1	15	0	7%						
Bakersfield	932-933	1	4	0	2%	Norwich	063	0	7	0	3%						
El Centro	922	1	-1	0	0%	Stamford	068-069	4	21	1	12%						
Eureka	955	1	-12	0	-5%	Waterbury	067	1	12	0	6%						
Fresno	936-938	0	-5	0	-2%	West Hartford	062	1	9	0	5%						
Herlong	961	2	-8	1	-3%	Delaware Average	1	3	0	2%							
Inglewood	902-905	3	16	1	9%	Dover	199	1	-9	0	-4%						
Irvine	926-927	3	24	1	13%	Newark	197	2	10	1	6%						
Lompoc	934	3	2	1	3%	Wilmington	198	0	9	0	4%						
Hawaii Average	17	25	6	20%													
Aliamanu	968	17	29	6	22%												
Ewa	967	17	23	6	20%												
Halawa Heights	967	17	23	6	20%												
Hilo	967	17	23	6	20%												
Honolulu	968	17	29	6	22%												
Kailua	968	17	29	6	22%												
Lualualei	967	17	23	6	20%												
Millanilani 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%												

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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.

	Unit	Bead diameter	1/8"	1/4"	3/8"	1/2"
Subfloor adhesive, on floors						
12" OC members	CSF	2.27	9.09	20.50	36.40	
16" OC members	CSF	1.70	6.82	15.30	27.30	
20" OC members	CSF	1.36	5.45	12.30	21.80	
24" OC members	CSF	1.14	4.55	10.20	18.20	
Wall sheathing or shear panel adhesive, on walls						
16" OC members	CSF	2.52	10.10	22.70	40.37	
20" OC members	CSF	2.01	8.05	18.10	32.20	
24" OC members	CSF	1.68	6.71	15.10	26.90	
Polystyrene or polyurethane foam panel adhesive, on walls						
12" OC members	CSF	3.46	13.90	31.20	55.40	
16" OC members	CSF	2.60	10.40	23.40	41.60	
20" OC members	CSF	2.08	8.31	18.70	33.30	
24" OC members	CSF	1.73	6.93	15.60	27.70	
Gypsum drywall adhesive						
12" OC members	CSF	1.27	5.07	11.40	20.30	
16" OC members	CSF	.95	3.80	8.55	15.20	
20" OC members	CSF	.76	3.04	6.84	12.20	
24" OC members	CSF	.63	2.53	5.70	10.10	
Hardboard or plastic panel adhesive, on walls						
12" OC members	CSF	3.36	13.40	30.20	53.70	
16" OC members	CSF	2.52	10.10	22.70	40.30	
20" OC members	CSF	2.01	8.05	18.10	32.20	
24" OC members	CSF	1.68	6.71	15.10	26.90	

Craft@Hrs	Unit	Material	Labor	Total
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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	—	2.77
16" OC members	BC@.056	CSF	—	2.07
20" OC members	BC@.052	CSF	—	1.92
24" OC members	BC@.042	CSF	—	1.55
Interior and exterior wall members				
12" OC members	BC@.100	CSF	—	3.69
16" OC members	BC@.090	CSF	—	3.32
20" OC members	BC@.084	CSF	—	3.10
24" OC members	BC@.084	CSF	—	3.10

Special purpose adhesives

Construction adhesive, for counters, cabinets, paneling,

brick veneer, ceramic fixtures, shelving,
sets in 10 minutes, 10.5 oz. cartridge

— Ea 1.62 — 1.62

Epoxy-tie adhesive, bonds concrete, fills cracks to 3/4",
seals doors and windows, anchor grouting,

non-shrink, 22 oz. cartridge

— Ea 26.30 — 26.30

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

— Ea 4.29 — 4.29

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	16.00	—	16.00
Project adhesive, rubber-based, bonds plywood, hardboard fiberglass, drywall, foam board, shelving, ceramic fixtures, 10 minute work time, 10.5 oz. cartridge	—	Ea	3.60	—	3.60

General purpose adhesives

	Unit	1 quart can	1 gallon can
Acoustic tile adhesive, solvent base, waterproof, sound deadening type	Ea	—	16.50
Aliphatic resin woodworking glue	Ea	11.50	26.00
Carpet cement, outdoor	Ea	16.80	—
Professional carpenter's glue, multi-purpose	Ea	10.00	30.00
Contact cement, rubber based, waterproof, bonds veneers to plywood, particleboard, wallboard	Ea	16.00	35.00
Gel contact cement	Ea	14.50	—
Resilient flooring adhesive, latex base, adheres to concrete, plywood, felt, sheet flooring	Ea	7.00	17.50
Tile cement, solvent base, ceramic/stone, interior	Ea	11.00	24.00

	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	27.30	—	27.30
3/4" (Number 3)	—	Ton	26.00	—	26.00
1-1/2" (Number 2)	—	Ton	27.30	—	27.30
Crushed slag, typical prices where available					
3/4" slag	—	Ton	17.50	—	17.50
1-1/2"	—	Ton	17.90	—	17.90
Washed gravel (1.4 tons per CY)					
3/4" gravel	—	Ton	27.30	—	27.30
1-1/2"	—	Ton	27.40	—	27.40
Fill sand (1.35 tons per CY)	—	Ton	12.70	—	12.70
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	—	—	375.00
Over 2,500 SF to 3,500 SF	—	LS	—	—	425.00
Over 3,500 SF to 5,000 SF	—	LS	—	—	525.00
Over 5,000 SF	—	LS	—	—	775.00
Small residential income properties (duplex, triplex, quadplex)					
2 to 4 units	—	LS	—	—	675.00
Apartment houses, commercial and industrial buildings					
To \$300,000 valuation	—	LS	—	—	3,250.00
Over \$300,000 to \$1,000,000 valuation	—	LS	—	—	4,250.00
Over \$1,000,000 to \$3,000,000 valuation	—	LS	—	—	4,750.00
Over \$3,000,000 to \$5,000,000 valuation	—	LS	—	—	6,000.00
Other services					
Additional photograph (each)	—	LS	—	—	27.50
Outlying area fee	—	LS	—	—	55.00
Satisfactory Completion (old Form 442 / new Form 1004d)	—	LS	—	—	150.00
Appraisal Update same comps (Form 1004d)	—	LS	—	—	300.00
Operating Income Statement (FNMA 216)	—	LS	—	—	80.00
SFR Rental Survey (FNMA 1007)	—	LS	—	—	80.00
Appraisal review (desk)	—	LS	—	—	175.00
Appraisal review (field)	—	LS	—	—	375.00
Drive-by appraisal (Form 2055) starting at	—	LS	—	—	275.00
Drive-by appraisal (Form 2070/2075)	—	LS	—	—	225.00
Machinery (Fee is based on total value of equipment appraised) Additional charges for travel and lodging may be required					
To \$30,000 valuation	—	LS	—	—	620.00
Over \$30,000 to \$100,000 valuation	—	LS	—	—	830.00
Over \$100,000 to \$500,000 valuation	—	LS	—	—	1,400.00
Over \$500,000 to \$1,000,000 valuation	—	LS	—	—	1,900.00
Over \$1,000,000 to \$5,000,000 valuation	—	LS	—	—	3,250.00
Court testimony (excluding preparation)	—	Day	—	—	1,500.00
Consulting fees are billed at an hourly rate	—	Hour	—	—	190.00
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.

Basement Doors

	Craft@Hrs	Unit	Material	Labor	Total
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	—	4.79	4.79
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

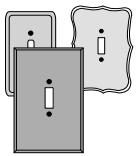
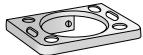
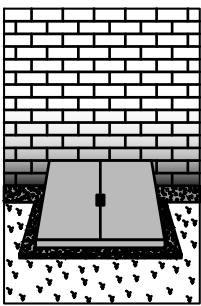
Basement Doors Good quality 12 gauge primed steel, center opening basement doors. Costs include assembly and installation hardware. No concrete, masonry, anchor placement or finish painting included.

Doors (overall dimensions)

Classic Series standard, all sizes	BC@3.41	Ea	633.00	126.00	759.00
SLW Series standard, all sizes	BC@3.41	Ea	656.00	126.00	782.00
Ultra Series, polyethylene, all sizes	BC@3.41	Ea	904.00	126.00	1,030.00
Add for keyed lock	BC@.160	Ea	72.80	5.91	78.71
Door extensions (available for 19-1/2"H, 55"W, 72"L door only)					
6" deep	BC@1.71	Ea	164.00	63.20	227.20
12" deep	BC@1.71	Ea	198.00	63.20	261.20
18" deep	BC@1.71	Ea	223.00	63.20	286.20
Stair stringers, steel, pre-cut for 2" x 10" wood treads (without treads)					
32" to 39" stair height	BC@1.71	Ea	102.00	63.20	165.20
48" to 55" stair height	BC@1.71	Ea	130.00	63.20	193.20
56" to 64" stair height	BC@1.71	Ea	143.00	63.20	206.20
65" to 72" stair height	BC@1.71	Ea	161.00	63.20	224.20
73" to 79" stair height	BC@1.71	Ea	223.00	63.20	286.20
81" to 88" stair height	BC@1.71	Ea	241.00	63.20	304.20
89" to 97" stair height	BC@1.71	Ea	258.00	63.20	321.20

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	12.40	9.53	21.93
Cup holder, porcelain, surface mounted	BC@.258	Ea	8.69	9.53	18.22
Cup, toothbrush & soap holder, recessed	BC@.258	Ea	32.90	9.53	42.43
Cup, toothbrush holder, polished brass	BC@.258	Ea	17.60	9.53	27.13
Electrical plates, chrome plated					
Switch plate, single	BE@.154	Ea	4.61	6.17	10.78
Switch plate, double	BE@.154	Ea	6.08	6.17	12.25
Duplex receptacle plate	BE@.154	Ea	4.61	6.17	10.78
Duplex receptacle and switch	BE@.154	Ea	6.06	6.17	12.23



Engineering Fees

Craft@Hrs	Unit	Material	Labor	Total
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Engineering Fees Typical cost for consulting work.

Acoustical engineering (Based on an hourly wage of \$70.00 to \$135.00)

Environmental noise survey of a lot; includes technician with measuring equipment, data reduction and analysis, and written report with recommendations

Written report with recommendations	—	LS	—	—	1,910.00
Exterior to interior noise analysis	—	LS	—	—	628.00
Measure "Impact Insulation Class" and "Sound Transmission Class" in existing buildings, (walls, floors, and ceilings)					
Minimum cost	—	LS	—	—	1,250.00
Priced by wall, floor, or ceiling sections					
Per section, approx. 100 SF	—	Ea	—	—	627.00
Analyze office, conference room, or examining room to assure acoustical privacy					
Per room analyzed	—	LS	—	—	551.00
Prepare acoustical design for church, auditorium, or lecture hall, (fees vary greatly with complexity of acoustics desired)					
Typical cost	—	LS	—	—	2,340.00
Evaluate noise problems from proposed building					
Impact on surrounding environment	—	LS	—	—	1,250.00
Evaluate noise problems from surrounding environment					
Impact on a proposed building	—	LS	—	—	1,020.00
Front end scheduling. Coordinate architectural, engineering and other consultant services, plan check times and other approval times					
For residential and commercial projects	—	LS	—	—	7,300.00
Project scheduling using CPM (Critical Path Method). Includes consultation, review of construction documents, development of construction logic, and graphic schedule. Comprehensive schedules to meet government or owner specifications will cost more.					
Wood frame buildings, 1 or 2 stories	—	LS	—	—	4,880.00
Structural engineering plan check, typical 2-story, 8 to 10 unit apartment building					
Typical price per apartment building	—	LS	—	—	1,280.00
Add for underground parking	—	LS	—	—	1,040.00

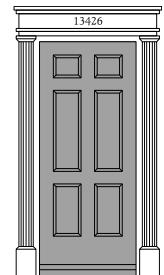
Entrances, Colonial An entrance consists of two pilasters (one at each side of the exterior opening) and a crosshead at the top of the door. A decorative pediment may rest on the crosshead. No crosshead is required if the pediment includes a breastboard. No door, frame or sill costs are included in the estimates below. Unpainted urethane.

Molded one-piece pilasters with plinth blocks, per set of two pilasters

1-1/2" wide x 86" high	BC@.800	Ea	41.20	29.60	70.80
3-1/2" wide x 81" high	BC@.800	Ea	51.70	29.60	81.30
3-1/2" wide x 108" high	BC@.800	Ea	63.70	29.60	93.30
5" wide x 108" high	BC@.800	Ea	95.50	29.60	125.10
7" wide x 90" high	BC@.800	Ea	115.00	29.60	144.60
9" wide x 90" high	BC@.800	Ea	148.00	29.60	177.60
9" wide x 108" high	BC@.800	Ea	149.00	29.60	178.60
11" wide x 144" high	BC@.800	Ea	267.00	29.60	296.60

Molded entrance crosshead, without pediment

40" wide by 6" high	BC@.400	Ea	40.90	14.80	55.70
48" wide by 6" high	BC@.400	Ea	49.10	14.80	63.90
78" wide by 6" high	BC@.400	Ea	79.70	14.80	94.50
40" wide by 10" high	BC@.400	Ea	60.90	14.80	75.70
48" wide by 10" high	BC@.400	Ea	73.10	14.80	87.90
78" wide by 10" high	BC@.400	Ea	119.00	14.80	133.80



Excavation

	Craft@Hrs	Unit	Material	Labor	Total
40" wide by 14" high	BC@.400	Ea	115.00	14.80	129.80
48" wide by 14" high	BC@.400	Ea	141.00	14.80	155.80
78" wide by 14" high	BC@.400	Ea	172.00	14.80	186.80
96" wide by 14" high	BC@.400	Ea	217.00	14.80	231.80
Molded pediment without breastboard (crosshead required)					
38" wide, 10" high peaked cap	BC@.400	Ea	90.30	14.80	105.10
48" wide, 13" high peaked cap	BC@.400	Ea	164.00	14.80	178.80
78" wide, 21" high peaked cap	BC@.400	Ea	173.00	14.80	187.80
42" wide, 12" high decorative acorn	BC@.400	Ea	84.90	14.80	99.70
56" wide, 13" high decorative acorn	BC@.400	Ea	74.10	14.80	88.90
78" wide, 16" high decorative acorn	BC@.400	Ea	161.00	14.80	175.80
49" wide, 18" high ram's head	BC@.400	Ea	148.00	14.80	162.80
61" wide, 21" high ram's head	BC@.400	Ea	139.00	14.80	153.80
91" wide, 29" high ram's head	BC@.400	Ea	204.00	14.80	218.80
Molded pediment with breastboard (no crosshead required)					
40" wide, 17" high peaked cap	BC@.400	Ea	90.30	14.80	105.10
48" wide, 19" high peaked cap	BC@.400	Ea	130.00	14.80	144.80
80" wide, 29" high peaked cap	BC@.400	Ea	187.00	14.80	201.80
50" wide, 21" high decorative acorn	BC@.400	Ea	92.60	14.80	107.40
58" wide, 22" high decorative acorn	BC@.400	Ea	117.00	14.80	131.80
80" wide, 26" high decorative acorn	BC@.400	Ea	157.00	14.80	171.80
50" wide, 24" high ram's head	BC@.400	Ea	148.00	14.80	162.80
58" wide, 25" high ram's head	BC@.400	Ea	184.00	14.80	198.80
80" wide, 36" high ram's head	BC@.400	Ea	243.00	14.80	257.80

Excavation and Backfill by Hand

Using hand tools.
General excavation, using a pick and shovel (loosening and one throw)

Light soil	BL@1.10	CY	—	32.90	32.90
Average soil	BL@1.70	CY	—	50.90	50.90
Heavy soil or loose rock	BL@2.25	CY	—	67.30	67.30

Backfilling (one shovel throw from stockpile)

Sand	BL@.367	CY	—	11.00	11.00
Average soil	BL@.467	CY	—	14.00	14.00
Rock or clay	BL@.625	CY	—	18.70	18.70
Add for compaction, average soil or sand	BL@.400	CY	—	12.00	12.00
Fine grading	BL@.008	SF	—	.24	.24

Footings, light soil, using a pick and shovel

6" deep x 12" wide (1.85 CY per CLF)	BL@.034	LF	—	1.02	1.02
8" deep x 12" wide (2.47 CY per CLF)	BL@.050	LF	—	1.50	1.50
8" deep x 16" wide (3.29 CY per CLF)	BL@.055	LF	—	1.65	1.65
8" deep x 18" wide (3.70 CY per CLF)	BL@.060	LF	—	1.80	1.80
10" deep x 12" wide (3.09 CY per CLF)	BL@.050	LF	—	1.50	1.50
10" deep x 16" wide (4.12 CY per CLF)	BL@.067	LF	—	2.01	2.01
10" deep x 18" wide (4.63 CY per CLF)	BL@.075	LF	—	2.24	2.24
12" deep x 12" wide (3.70 CY per CLF)	BL@.060	LF	—	1.80	1.80
12" deep x 16" wide (4.94 CY per CLF)	BL@.081	LF	—	2.42	2.42
12" deep x 20" wide (6.17 CY per CLF)	BL@.100	LF	—	2.99	2.99
12" deep x 24" wide (7.41 CY per CLF)	BL@.125	LF	—	3.74	3.74
16" deep x 16" wide (6.59 CY per CLF)	BL@.110	LF	—	3.29	3.29
Add for average soil - loose rock or roots	—	%	—	50.0	—

Loading trucks (shoveling, one throw)

Average soil	BL@1.45	CY	—	43.40	43.40
Rock or clay	BL@2.68	CY	—	80.20	80.20

Excavation

	Craft@Hrs	Unit	Material	Labor	Total
Pits to 5' (pits over 5' require shoring)					
Light soil	BL@1.34	CY	—	40.10	40.10
Average soil	BL@2.00	CY	—	59.90	59.90
Heavy soil	BL@2.75	CY	—	82.30	82.30
Shaping trench bottom for pipe					
To 10" pipe	BL@.024	LF	—	.72	.72
12" to 20" pipe	BL@.076	LF	—	2.27	2.27
Shaping embankment slopes					
Up to 1 in 4 slope	BL@.060	SY	—	1.80	1.80
Over 1 in 4 slope	BL@.075	SY	—	2.24	2.24
Add for top crown or toe	—	%	—	50.0	—
Add for swales	—	%	—	90.0	—
Spreading material piled on site					
Average soil	BL@.367	CY	—	11.00	11.00
Stone or clay	BL@.468	CY	—	14.00	14.00
Strip and pile top soil, depths to 6"	BL@.024	SF	—	.72	.72
Tamping, hand tamp only	BL@.612	CY	—	18.30	18.30
Trenches to 5', soil piled beside trench					
Light soil	BL@1.13	CY	—	33.80	33.80
Average soil	BL@1.84	CY	—	55.10	55.10
Heavy soil or loose rock	BL@2.86	CY	—	85.60	85.60

Craft@Hrs	Unit	Material	Labor	Equipment	Total
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Trenching and Backfill with Heavy Equipment These costs and productivity are based on utility line trenches and continuous footings where the spoil is piled adjacent to the trench. Linear feet (LF) and cubic yards (CY) per hour shown are based on a crew of two. Reduce productivity by 10% to 25% when spoil is loaded in trucks. Shoring, dewatering or unusual conditions are not included.

Wheel loader 55 HP, with integral backhoe

12" wide bucket, for 12" wide trench. Depths 3' to 5'					
Light soil (60 LF per hour)	B8@.033	LF	—	1.19	.69
Medium soil (55 LF per hour)	B8@.036	LF	—	1.30	.75
Heavy or wet soil (35 LF per hour)	B8@.057	LF	—	2.05	1.18
18" wide bucket, for 18" wide trench. Depths 3' to 5'					
Light soil (55 LF per hour)	B8@.036	LF	—	1.30	.75
Medium soil (50 LF per hour)	B8@.040	LF	—	1.44	.83
Heavy or wet soil (30 LF per hour)	B8@.067	LF	—	2.41	1.39
24" wide bucket, for 24" wide trench. Depths 3' to 5'					
Light soil (50 LF per hour)	B8@.040	LF	—	1.44	.83
Medium soil (45 LF per hour)	B8@.044	LF	—	1.59	.91
Heavy or wet soil (25 LF per hour)	B8@.080	LF	—	2.88	1.66

Backfill trenches from loose material piled adjacent to trench. No compaction included.

Soil, previously excavated

Front-end loader 60 HP (50 CY per hour)	B8@.040	CY	—	1.44	.75	2.19
D-3 crawler dozer (25 CY per hour)	B8@.080	CY	—	2.88	2.02	4.90
3/4 CY crawler loader (33 CY per hour)	B8@.061	CY	—	2.20	1.28	3.48
D-7 crawler dozer (130 CY per hour)	B8@.015	CY	—	.54	.83	1.37
Sand or gravel bedding						
3/4 CY wheel loader (80 CY per hour)	B8@.025	CY	—	.90	.39	1.29

Excavation with Heavy Equipment

	Craft@Hrs	Unit	Material	Labor	Equipment	Total
Compaction of soil in trenches in 8" layers						
Pneumatic tampers (40 CY per hour)	BL@.050	CY	—	1.50	1.19	2.69
Vibrating rammers, gasoline powered "Jumping Jack" (20 CY per hour)	BL@.100	CY	—	2.99	1.11	4.10
	Craft@Hrs	Unit	Material	Labor		Total
Excavation with Heavy Equipment These figures assume a crew of one operator unless noted otherwise. Only labor costs are included here. See equipment rental costs at the end of this section. Use the productivity rates listed here to determine the number of hours or days that the equipment will be needed. For larger jobs and commercial work, see excavation costs under Site Work in the Commercial and Industrial division of this book.						
Excavation rule of thumb for small jobs	—	CY	—	2.85	2.85	
Backhoe, operator and one laborer, 3/4 CY bucket						
Light soil (13.2 CY per hour)	B8@.152	CY	—	5.48	5.48	
Average soil (12.5 CY per hour)	B8@.160	CY	—	5.76	5.76	
Heavy soil (10.3 CY per hour)	B8@.194	CY	—	6.99	6.99	
Sand (16 CY per hour)	B8@.125	CY	—	4.50	4.50	
Add when using 1/2 CY bucket	—	%	—	25.0	—	
Bulldozer, 65 HP unit						
Backfill (36 CY per hour)	OE@.027	CY	—	1.14	1.14	
Clearing brush (900 SF per hour)	OE@.001	SF	—	.04	.04	
Add for thick brush	—	%	—	300.0	—	
Spread dumped soil (42 CY per hour)	OE@.024	CY	—	1.01	1.01	
Strip topsoil (17 CY per hour)	OE@.059	CY	—	2.49	2.49	
Bulldozer, 90 HP unit						
Backfill (40 CY per hour)	OE@.025	CY	—	1.05	1.05	
Clearing brush (1,000 SF per hour)	OE@.001	SF	—	.04	.04	
Add for thick brush	—	%	—	300.0	—	
Spread dumped soil (45 CY per hour)	OE@.023	CY	—	.97	.97	
Strip top soil (20 CY per hour)	OE@.050	CY	—	2.11	2.11	
Bulldozer, 140 HP unit						
Backfill (53 CY per hour)	OE@.019	CY	—	.80	.80	
Clearing brush (1,250 SF per hour)	OE@.001	SF	—	.04	.04	
Add for thick brush	—	%	—	200.0	—	
Spread dumped soil (63 CY per hour)	OE@.016	CY	—	.67	.67	
Strip top soil (25 CY per hour)	OE@.040	CY	—	1.69	1.69	
Dump truck, spot, load, unload, travel						
3 CY truck						
Short haul (9 CY per hour)	B7@.222	CY	—	6.73	6.73	
2-3 mile haul (6 CY per hour)	B7@.333	CY	—	10.10	10.10	
4 mile haul (4 CY per hour)	B7@.500	CY	—	15.20	15.20	
5 mile haul (3 CY per hour)	B7@.666	CY	—	20.20	20.20	
4 CY truck						
Short haul (11 CY per hour)	B7@.182	CY	—	5.52	5.52	
2-3 mile haul (7 CY per hour)	B7@.286	CY	—	8.67	8.67	
4 mile haul (5.5 CY per hour)	B7@.364	CY	—	11.00	11.00	
5 mile haul (4.5 CY per hour)	B7@.444	CY	—	13.50	13.50	
5 CY truck						
Short haul (14 CY per hour)	B7@.143	CY	—	4.34	4.34	
2-3 mile haul (9.5 CY per hour)	B7@.211	CY	—	6.40	6.40	
4 mile haul (6.5 CY per hour)	B7@.308	CY	—	9.34	9.34	
5 mile haul (5.5 CY per hour)	B7@.364	CY	—	11.00	11.00	

Excavation Equipment Rental

	Craft@Hrs	Unit	Material	Labor	Total
Jackhammer, one laborer (per CY of unloosened soil)					
Average soil (2-1/2 CY per hour)	BL@.400	CY	—	12.00	12.00
Heavy soil (2 CY per hour)	BL@.500	CY	—	15.00	15.00
Igneous or dense rock (.7 CY per hour)	BL@1.43	CY	—	42.80	42.80
Most weathered rock (1.2 CY per hour)	BL@.833	CY	—	24.90	24.90
Soft sedimentary rock (2 CY per hour)	BL@.500	CY	—	15.00	15.00
Air tamp (3 CY per hour)	BL@.333	CY	—	9.97	9.97
Loader (tractor shovel)					
Piling earth on premises, 1 CY bucket					
Light soil (43 CY per hour)	OE@.023	CY	—	.97	.97
Heavy soil (35 CY per hour)	OE@.029	CY	—	1.22	1.22
Loading trucks, 1 CY bucket					
Light soil (53 CY per hour)	OE@.019	CY	—	.80	.80
Average soil (43 CY per hour)	OE@.023	CY	—	.97	.97
Heavy soil (40 CY per hour)	OE@.025	CY	—	1.05	1.05
Deduct for 2-1/4 CY bucket	—	%	—	-43.0	—
Sheepsfoot roller (18.8 CSF per hour)	OE@.001	SF	—	.04	.04
Sprinkling with truck, (62.3 CSF per hour)	TR@.001	SF	—	.03	.03
Tree and brush removal, labor only (clear and grub, one operator and one laborer)					
Light brush	B8@34.8	Acre	—	1,250.00	1,250.00
Heavy brush	B8@45.2	Acre	—	1,630.00	1,630.00
Wooded	B8@48.7	Acre	—	1,750.00	1,750.00
Tree removal, cutting trees, removing branches, cutting into short lengths with chain saws and axes, by tree diameter, labor only					
8" to 12" (5 manhours per tree)	BL@5.00	Ea	—	150.00	150.00
13" to 18" (7 manhours per tree)	BL@7.00	Ea	—	210.00	210.00
19" to 24" (11 manhours per tree)	BL@11.0	Ea	—	329.00	329.00
25" to 36" (14 manhours per tree)	BL@14.0	Ea	—	419.00	419.00
Tree stump removal, using a small backhoe, by tree diameter, operator only					
6" to 10" (1.6 manhours per stump)	OE@1.60	Ea	—	67.40	67.40
11" to 14" (2.1 manhours per stump)	OE@2.10	Ea	—	88.50	88.50
15" to 18" (2.6 manhours per stump)	OE@2.60	Ea	—	110.00	110.00
19" to 24" (3.1 manhours per stump)	OE@3.10	Ea	—	131.00	131.00
25" to 30" (3.3 manhours per stump)	OE@3.30	Ea	—	139.00	139.00
Trenching machine, crawler-mounted					
Light soil (27 CY per hour)	OE@.037	CY	—	1.56	1.56
Heavy soil (21 CY per hour)	OE@.048	CY	—	2.02	2.02
Add for pneumatic-tired machine	—	%	—	15.0	—

Excavation Equipment Rental Costs Typical cost not including fuel, delivery or pickup charges. Add labor costs from the previous section. Half day minimums.

	1/2 day	Day	Week
Backhoe, wheeled mounted			
55 HP unit, 1/8 to 3/4 CY bucket	249.00	356.00	1,000.00
65 HP unit, 1/4 to 1 CY bucket	292.00	417.00	1,320.00
Add for each delivery or pickup	150.00	150.00	150.00
Bulldozer, crawler tractor			
65 HP	312.00	445.00	1,330.00
90 to 105 HP unit, D-4 or D-5	416.00	594.00	1,610.00
140 HP unit, D-6	568.00	811.00	2,310.00
Add for each delivery or pickup	150.00	150.00	150.00

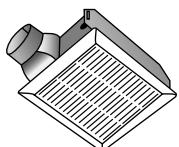
Excavation Equipment Rental

	1/2 day	Day	Week
Dump truck, on-highway type			
3 CY	245.00	350.00	954.00
5 CY	271.00	387.00	1,080.00
10 CY	563.00	804.00	2,570.00
Wheel loaders, front-end load and dump, diesel			
3/4 CY bucket, 4WD, articulated	123.00	176.00	611.00
1 CY bucket, 4WD, articulated	219.00	313.00	913.00
2 CY bucket, 4WD, articulated	324.00	463.00	1,380.00
3-1/4 CY bucket, 4WD, articulated	536.00	765.00	2,200.00
5 CY bucket, 4WD, articulated	636.00	908.00	2,750.00
Add for each delivery or pickup	150.00	150.00	150.00
Sheepsfoot roller, towed type, 40" diameter, 48" wide, double drum	126.00	180.00	550.00
Trenching machine, to 5'6" depth, 6" to 16" width capacity, crawler-mounted type	146.00	208.00	690.00
Add for each delivery or pickup	150.00	150.00	150.00
Compactor, 32" plate width, manually guided, gasoline engine, vibratory plate type	181.00	259.00	700.00
Chain saw, 18" to 23" bar, gasoline engine	102.00	145.00	334.00
Breakers, pavement, medium duty, with blade Including 50' of 1" hose	52.00	74.00	242.00
Air compressors, trailer-mounted, gas powered, silenced			
100 CFM to 150 CFM	116.00	165.00	445.00
175 CFM	193.00	275.00	770.00

Craft@Hrs	Unit	Material	Labor	Total
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Fans

Economy ceiling and wall exhaust fan. For baths, utility, and recreation rooms. For baths up to 45 square feet, other rooms up to 60 square feet. Installs in ceiling or in wall. Plastic duct collar. White polymeric grille. UL listed for use in tub and shower enclosure with GFI branch circuit wiring. Housing dimensions: 8-1/16-inch length, 7-3/16-inch width, 3-7/8-inch depth. Grille size, 8-11/16-inch x 9-1/2-inch. 3-inch duct. 0.75 amp. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.



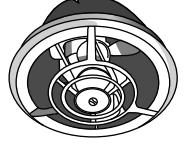
50 CFM, 2.5 sones	BE@1.00	Ea	13.20	40.00	53.20
70 CFM, 4.0 sones	BE@1.00	Ea	23.70	40.00	63.70

Vertical discharge bath fan. Galvanized steel housing, with built-in damper and spin-on white polymeric grille. Polymeric fan blade and duct connectors. Built-in double steel mounting ears with keyhole slots. Fits 8-inch ducts. UL listed. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.



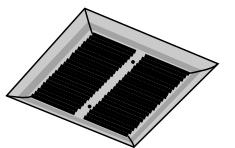
80 CFM, 1.0 sones	BE@1.00	Ea	96.70	40.00	136.70
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Vertical discharge utility fan. Mounts in ceiling. Discharges through duct to roof or wall. Pre-wired motor with plug-in receptacle. Adjustable hanger bars for 16- or 24-inch on-center joists. Silver anodized aluminum grille. Fits 7-inch round ducts. Housing dimensions: 11-inch diameter x 5-5/8-inch deep. UL listed. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.



210 CFM, 6.5 sones	BE@1.00	Ea	53.10	40.00	93.10
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Ceiling or wall bath exhaust fan. White polymeric grille. Torsion spring grille mounting requires no tools. Plug-in, permanently lubricated motor. Centrifugal blower wheel. Rugged, 26 gauge galvanized steel housing. Sturdy key holes mounting brackets for quick, accurate installation. Tapered, polymeric duct fitting with built-in backdraft damper. U.L. listed for use over bathtubs and showers when connected to a GFCI circuit. 120 volts, 0.5 amps, 2.5 sones, 80 CFM (HVI-2100 certified) and 4-inch round duct. Labor includes setting and connecting only. Add the cost of wiring and ducting.



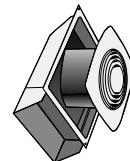
80 CFM, 2.5 sones	BE@1.00	Ea	58.30	40.00	98.30
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Fans

Craft@Hrs	Unit	Material	Labor	Total
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Bath exhaust fan. Pre-wired outlet box for plug-in receptacle, torsion spring-mounted low-profile grille. Steel housing, damper to eliminate back drafts. Labor includes setting and connecting only. Add the cost of wiring and ducting.

80 CFM, 2.5 sones, to 80 SF bath BE@1.00 Ea 80.10 40.00 120.10



Thru-the-wall utility fan. Steel housing with built-in damper and white polymeric grille. Permanently lubricated motor. Rotary on and off switch. Housing dimensions: 14-1/4-inch length, 14-1/4-inch width, 4-1/2-inch depth. UL listed. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and exterior finish.

180 CFM, 5.0 sones BE@1.00 Ea 62.20 40.00 102.20

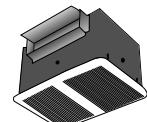


QuieTTTest® low-sound bath fan. For 105 square foot bath. Pre-wired outlet box with plug-in receptacle. Adjustable hanger brackets. Fits 4-inch round ducts. Low-profile white polymeric grille, torsion-spring mounted. Housing dimensions: 9-3/8-inch length, 11-1/4-inch width, 7-7/8-inch depth. Grille size, 14-1/4-inch x 12-1/16-inch. UL listed for use in tub and shower when used with GFI branch circuit wiring. Not recommended for kitchen use. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

110 CFM, 2.0 sones BE@1.00 Ea 102.00 40.00 142.00

QuieTTTest® low-sound ceiling blower. For 375 square foot room. Pre-wired outlet box with plug-in receptacle. Rounded, low-profile white polymeric grille with silver anodized trim at each end. Fits 3-1/4-inch x 10-inch ducts. Housing dimensions: 14-1/4-inch length, 10-inch width, 9-inch depth. Grille size, 16-1/2-inch x 12-3/32 inch. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

300 CFM, 4.5 sones BE@1.00 Ea 123.00 40.00 163.00

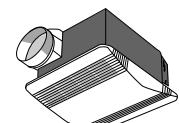


Lighted Bath Exhaust Fans

ValueTest™ economy bath fan and light, NuTone. Fan and light operate separately or together. Fits 4-inch ducts. White polymeric grille with break-resistant lens. Uses 100-watt lamp (not included). Housing dimensions: 9-inch length, 9-inch width, 5-1/2-inch depth. Grille size, 10-3/4-inch x 12-1/8-inch. UL listed for use in tub and shower when used with GFI branch circuit wiring. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

50 CFM, 2.5 sones, 45 SF bath BE@1.00 Ea 34.20 40.00 74.20

70 CFM, 4.5 sones, 65 SF bath BE@1.00 Ea 69.40 40.00 109.40

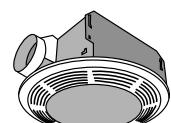


Decorative bath exhaust fan with light, Broan Manufacturing. Corrosion-resistant finish. Frosted melon glass globe. 60 watt max. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

70 CFM, 3.5 sones BE@1.00 Ea 85.20 40.00 125.20

Exhaust Air deluxe bath fan with light, NuTone. Ventilation for baths up to 95 square feet, other rooms up to 125 square feet. 100 and 7 watt ceiling and night-light or energy-saving fluorescent light (lamps not included). Snap-on grille assembly. Housing dimensions: 9-inch length, 9-inch width, 6-inch depth. Polymeric white grille, 15-inch diameter. UL listed for use in tub and shower when used with GFI branch circuit wiring. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

100 CFM, 3.5 sones BE@1.00 Ea 130.00 40.00 170.00

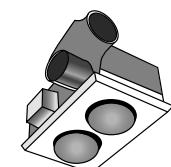


Bath Exhaust Fan with Heater

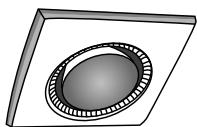
Infrared bulb heater and fan. 4-point adjustable mounting brackets span up to 24-inches. Uses 250 watt, 120 volt R-40 infrared bulbs (not included). Heater and fan units include 70 CFM, 3.5 sones ventilator fan. Damper and duct connector included. Plastic matte-white molded grille and compact housings. CFM (cubic feet of air per minute). Labor includes setting and connecting only. Add the cost of wiring and ducting.

1-bulb, 70 CFM, 3.5 sones BE@1.00 Ea 58.00 40.00 98.00

2-bulb heater, 7" duct BE@1.10 Ea 70.80 44.00 114.80



Fans



Heat-A-Lamp® bulb heater and fan, NuTone. Non-IC. Swivel-mount. Torsion spring holds plates firmly to ceiling. 250-watt radiant heat from one R-40 infrared heat lamp. Uses 4-inch duct. Adjustable socket for ceilings up to 1-inch thick. Adjustable hanger bars. Automatic reset for thermal protection. White polymeric finish. UL listed. Btu (British Thermal Unit). 6-7/8" high. Labor includes setting and connecting only. Add the cost of wiring and ducting.

2.6 amp, 1 lamp, 12-1/2" x 10"	BE@1.50	Ea	53.60	60.10	113.70
5.0 amp, 2 lamp, 15-3/8" x 11"	BE@1.50	Ea	77.60	60.10	137.70

Surface-mount ceiling bath resistance heater and fan. 1250 watt. 4266 Btu (British Thermal Unit). 120 volt. Chrome alloy wire element for instant heat. Built-in fan. Automatic overheat protection. Low-profile housing. Permanently lubricated motor. Mounts to standard 3-1/4-inch round or 4-inch octagonal ceiling electrical box. Satin-finish aluminum grille extends 2-3/4-inch from ceiling. 11" diameter x 2-3/4" deep. Labor includes setting and connecting only. Add the cost of wiring and ducting.

10.7 amp	BE@.750	Ea	60.90	30.00	90.90
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Designer Series bath heater and exhaust fan, Broan Manufacturing. 1500-watt fan-forced heater. 120-watt light capacity, 7-watt night-light (bulbs not included). Permanently lubricated motor. Polymeric damper prevents cold back drafts. 4-point adjustable mounting brackets with keyhole slots. Torsion-spring grille mounting, no tools needed. Non-glare light diffusing glass lenses. Fits single gang opening. Suitable for use with insulation. Includes 4-function control unit. CFM (cubic feet of air per minute). 100 CFM, 1.2 sones. Labor includes setting and connecting only. Add the cost of wiring and ducting.

4" duct, 100 watt lamp	BE@1.00	Ea	242.00	40.00	282.00
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Exhaust Fan Accessories

Timer switch

60-minute timer, analog	BE@.250	Ea	22.20	10.00	32.20
60-minute timer, digital	BE@.250	Ea	20.10	10.00	30.10

Exhaust fan switch

On/Off switch with humidity control, white	BE@.300	Ea	38.60	12.00	50.60
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SensAire® 4-function wall control switch. Fits single gang opening. Top switch for on-auto-off. Other switches for light and night-light. For use with SensAire® fans and lights.

White	BE@.250	Ea	20.50	10.00	30.50
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Bath vent kit, thru-wall, UL listed, 5' of 4" duct, polymeric louvered wall cap, 3" to 4" increaser and 2 clamps. Fire resistant.

Flexible duct	SW@.650	Ea	18.00	27.00	45.00
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Roof vent kit. For venting kitchen or bath exhaust fan through slanted roof. Works with both 3-inch and 4-inch ducted units.

8-foot length	SW@.650	Ea	23.10	27.00	50.10
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Ventilators

Roof turbine vent with base



12", galvanized	SW@1.00	Ea	29.20	41.60	70.80
12", weathered wood	SW@1.00	Ea	42.30	41.60	83.90
12", white aluminum	SW@1.00	Ea	67.70	41.60	109.30
Add for steep pitch base	SW@.440	Ea	9.52	18.30	27.82
Add for weather cap	—	Ea	11.00	—	11.00

Belt drive attic exhaust fan, 1/3 HP, with aluminum shutter and plenum boards

24" diameter	SW@3.00	Ea	215.00	125.00	340.00
30" diameter	SW@3.00	Ea	272.00	125.00	397.00
36" diameter	SW@3.00	Ea	276.00	125.00	401.00

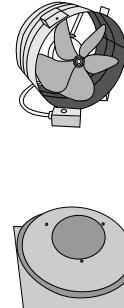
Deduct for direct drive exhaust fans

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12-hour timer switch	BE@.950	Ea	35.10	38.00	73.10
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Fans

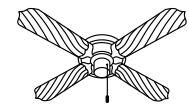
	Craft@Hrs	Unit	Material	Labor	Total
Power attic gable vent					
1,280 CFM	SW@1.65	Ea	65.40	68.60	134.00
1,540 CFM	SW@1.65	Ea	84.50	68.60	153.10
1,600 CFM	SW@1.65	Ea	85.10	68.60	153.70
Shutter for gable vent	SW@.450	Ea	44.70	18.70	63.40
Humidistat control	BE@.550	Ea	30.50	22.00	52.50
Thermostat control	BE@.550	Ea	26.60	22.00	48.60
Roof-mount power ventilator					
1,250 CFM	SW@1.65	Ea	86.00	68.60	154.60
1,600 CFM	SW@1.65	Ea	110.00	68.60	178.60



Ceiling Fans

Ceiling fans, decorative, 3-speed reversible motors, lighting kits optional (see below). Includes 10' of type NM cable, installation and connection.

42" four-blade fan, white finish	BE@1.50	Ea	85.00	60.10	145.10
44" five blade fan with 3 spotlights	BE@1.50	Ea	92.90	60.10	153.00
44" five-blade reversible fan	BE@1.50	Ea	114.00	60.10	174.10
48" five rattan blade fan	BE@1.50	Ea	168.00	60.10	228.10
56" five-blade leaf design premium fan	BE@1.50	Ea	262.00	60.10	322.10
Optional lighting fixtures for ceiling fans					
Vaulted ceiling mount	BE@.350	Ea	20.60	14.00	34.60
Schoolhouse or round globe, brass trim	BE@.283	Ea	18.40	11.30	29.70
Add for ball pull chain	BE@.017	Ea	5.28	.68	5.96
Add for pack of four ceiling fan light bulbs	BE@.017	Pack	9.31	.68	9.99



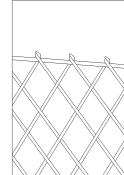
Garage exhaust fans For enclosed automotive garage space. U.S. Green Building Council, Underwriters Laboratories and CSA approved. Includes tamper-proof metal enclosure, sensor, fan actuator, weatherproof exhaust grille and cover, outlet duct and relay switch. Add for electrical connection.

Home garage exhaust fan, roof or upper sidewall mount, 110 volts.

118 CFM	SW@2.00	Ea	520.00	83.20	603.20
235 CFM	SW@2.00	Ea	580.00	83.20	663.20
416 CFM	SW@2.50	Ea	610.00	104.00	714.00

Parking garage exhaust fan, 208 volts, remote sensor controlled

400 CFM	SW@2.00	Ea	520.00	83.20	603.20
600 CFM	SW@2.00	Ea	580.00	83.20	663.20
800 CFM	SW@2.50	Ea	610.00	104.00	714.00
1,000 CFM	SW@2.75	Ea	661.00	114.00	775.00
1,500 CFM	SW@3.00	Ea	964.00	125.00	1,089.00
2,000 CFM	SW@3.50	Ea	1,220.00	146.00	1,366.00
Mount sensors	SW@.250	Ea	498.00	10.40	508.40
Apply fan frame sealant	SW@.150	LF	2.54	6.24	8.78
Install electrical wiring	BE@.150	LF	1.85	6.01	7.86
Install controls	BE@.500	Ea	—	20.00	20.00
Commission and test	P1@4.00	Ea	—	146.00	146.00



Fencing, Chain Link

Galvanized steel, 11.5 gauge 2" x 2" fence fabric, 2-3/8" terminal post with post caps, 1-5/8" line posts at 10' with loop line post caps, 1-3/8" top rail with rail ends, tension bands, tension bars and required bolts with nuts. Material includes 2/3 CF sack of concrete per post. Use 50 LF of fence as a minimum job cost.

36" high	BL@.125	LF	3.94	3.74	7.68
42" high	BL@.125	LF	4.20	3.74	7.94

Fencing, Chain Link

	Craft@Hrs	Unit	Material	Labor	Total
48" high	BL@.125	LF	4.36	3.74	8.10
60" high	BL@.125	LF	5.06	3.74	8.80
72" high	BL@.125	LF	5.95	3.74	9.69
Add for redwood filler strips	BL@.024	LF	5.30	.72	6.02
Add for aluminum filler strips	BL@.018	LF	6.28	.54	6.82
Add for PVC filler strips	BL@.018	LF	6.55	.54	7.09
Gates, driveway or walkway. Same construction as fencing shown above, assembled units ready to install. Add for gate hardware from below.					
Driveway gates, costs per linear foot (LF)					
36" high	BL@.025	LF	20.50	.75	21.25
42" high	BL@.025	LF	21.20	.75	21.95
48" high	BL@.025	LF	21.70	.75	22.45
60" high	BL@.033	LF	22.90	.99	23.89
72" high	BL@.033	LF	26.40	.99	27.39
3'6" wide walkway gate, costs per gate					
36" high	BL@.500	Ea	83.40	15.00	98.40
42" high	BL@.500	Ea	86.20	15.00	101.20
48" high	BL@.500	Ea	88.30	15.00	103.30
60" high	BL@.666	Ea	93.60	19.90	113.50
72" high	BL@.666	Ea	95.90	19.90	115.80
Add for gate hardware, per gate. Labor is included with labor shown for gate above. Includes latch, hanger brackets, bolts and hinge.					
Driveway gate hardware					
36" or 42" high	—	Ea	24.20	—	24.20
48" or 60" high	—	Ea	24.20	—	24.20
72" high	—	Ea	24.20	—	24.20
Walkway gate hardware					
36" or 42" high	—	Ea	9.79	—	9.79
48" or 60" high	—	Ea	9.79	—	9.79
72" high	—	Ea	9.79	—	9.79
Pet enclosure fencing panels. Chain link fence, galvanized steel, 11 gauge, 2" x 2" mesh fence fabric, 1-3/8" tubular steel frame, does not include any foundation costs.					
5'H x 3'W, panel	BL@.750	Ea	94.20	22.40	116.60
5'H x 4'W, panel	BL@.750	Ea	98.20	22.40	120.60
5'H x 6'W, panel	BL@.850	Ea	106.00	25.40	131.40
6'H x 3'W, panel	BL@.750	Ea	99.00	22.40	121.40
6'H x 4'W, panel	BL@.750	Ea	104.00	22.40	126.40
6'H x 6'W, panel	BL@.850	Ea	112.00	25.40	137.40
8'H x 6'W, panel	BL@1.0	Ea	136.00	29.90	165.90
5'H x 4'W, panel w/ gate	BL@1.00	Ea	198.00	29.90	227.90
5'H x 8'W, panel w/ gate	BL@1.50	Ea	214.00	44.90	258.90
6'H x 4'W, panel w/ gate	BL@1.00	Ea	207.00	29.90	236.90
6'H x 8'W, panel w/ gate	BL@1.50	Ea	225.00	44.90	269.90
8'H x 6'W, panel w/ gate	BL@4.75	Ea	259.00	142.00	401.00

Fence, Galvanized Wire Mesh With 1-5/8" galvanized steel posts, set without concrete 10' OC.

12-1/2 gauge steel, 12" vertical wire spacing

36" high, 6 horizontal wires	BL@.127	LF	2.46	3.80	6.26
48" high, 8 horizontal wires	BL@.127	LF	2.90	3.80	6.70
60" high, 8 horizontal wires	BL@.127	LF	2.82	3.80	6.62
72" high, 8 horizontal wires	BL@.127	LF	3.09	3.80	6.89



Fence Post Holes

	Craft@Hrs	Unit	Material	Labor	Total
11 gauge fence fabric, 9" vertical wire spacing					
42" high, 8 horizontal wires	BL@.127	LF	2.58	3.80	6.38
48" high, 9 horizontal wires	BL@.127	LF	2.83	3.80	6.63
14 gauge fence fabric, 6" vertical wire spacing					
36" high, 8 horizontal wires	BL@.127	LF	2.57	3.80	6.37
48" high, 9 horizontal wires	BL@.127	LF	2.34	3.80	6.14
60" high, 10 horizontal wires	BL@.127	LF	2.66	3.80	6.46
Add for components for electrified galvanized wire mesh fence					
15 gauge aluminum wire, single strand	BL@.050	LF	.25	1.50	1.75
12-1/2 gauge barbed wire, 4 barbs per LF	BL@.050	LF	.11	1.50	1.61
Charging unit for electric fence, Solar powered, 10 mile range, built in 6V battery	BL@.500	Ea	199.00	15.00	214.00
Charging unit, Solar powered, 3 mile range, indoors or out	BL@.500	Ea	137.00	15.00	152.00
Charging unit, 110V, 15 mile range, indoors or out	BL@.500	Ea	52.80	15.00	67.80
Fence stays for barbed wire, 48" high	BL@.250	Ea	.97	7.48	8.45
Add for electric fence warning sign					
Yellow with black lettering	BL@.125	Ea	.89	3.74	4.63
Add for polyethylene insulators	BL@.250	Ea	.23	7.48	7.71
Add for non-conductive gate fastener	BL@.500	Ea	4.34	15.00	19.34
Add for lightning arrestor kit	BL@.500	Ea	10.40	15.00	25.40

Fence Post Holes

Based on holes 1' diameter and 2' deep with easy access on level terrain. Adjustments for other conditions are below. Per hole dug.

Excavate post hole by hand

Light soil, sand or loam	BL@.400	Ea	—	12.00	12.00
Medium soil, gravel or light clay	BL@.600	Ea	—	18.00	18.00
Heavy soil, shale, sandstone, rocky	BL@1.00	Ea	—	29.90	29.90

Excavate post hole with power auger. Add the auger cost.

Light soil, sand or loam	BL@.200	Ea	—	5.99	5.99
Medium soil, gravel or light clay	BL@.250	Ea	—	7.48	7.48
Heavy soil, shale, sandstone, rocky	BL@.300	Ea	—	8.98	8.98

Setting Fence Posts

Posts set with concrete, including temporary 1" x 6" bracing and stakes. Heights to 6'. Concrete assumes post hole is 1' x 1' x 2' deep. Per post set, using either wood or metal post.

Set and brace wood or metal fence post

Lay in gravel for drainage	BL@.010	Ea	.02	.30	.32
Set 4" x 4" x 8' treated wood post	BL@.015	Ea	9.55	.45	10.00
Set 18 gauge 1-7/8" metal tube post with cap	BL@.015	Ea	16.30	.45	16.75
Check and adjust post alignment	BL@.010	Ea	—	.30	.30
Plumb and brace post (5 uses)	BL@.100	Ea	.50	2.99	3.49
Backfill with concrete or soil	BL@.030	Ea	—	.90	.90
Tamp soil or rod concrete	BL@.010	Ea	—	.30	.30
Trowel drainage crown	BL@.010	Ea	—	.30	.30
Strip bracing and inspect	BL@.020	Ea	—	.60	.60
Concrete for post base, 60 lb. sack, mixed	BL@.125	Ea	3.32	3.74	7.06
Total per fence post (wood)	BL@.330	Ea	13.39	9.88	23.27
Wood posts 10' OC, per LF of fence	BL@.033	LF	1.34	.99	2.33
Total per fence post (metal)	BL@.330	Ea	20.14	9.88	30.02
Metal posts 10' OC, per LF of fence	BL@.033	LF	2.01	.99	3.00

Fencing, Wood

	Craft@Hrs	Unit	Material	Labor	Total
Setting Fence Rail on Wood Posts					
Stringing 2" x 4" wood rail between fence posts, including 2" x 4" pressure treated rail at \$.62 per linear foot.					
Measure opening between posts	BL@.010	Ea	—	.30	.30
Measure and cut 10' pressure treated rail	BL@.015	Ea	7.45	.45	7.90
Measure rail position on post	BL@.010	Ea	—	.30	.30
Nail one end in place	BL@.010	Ea	.02	.30	.32
Position other end and check for level	BL@.020	Ea	—	.60	.60
Nail second end in place	BL@.010	Ea	.02	.30	.32
Recheck level and adjust as needed	BL@.015	Ea	—	.45	.45
Paint cut ends, post connections, rail side	BL@.100	Ea	—	2.99	2.99
Set one rail nailed in place, total	BL@.190	Ea	7.49	5.69	13.18
Set two rails, per LF of fence, 10' rails	BL@.038	LF	1.50	1.14	2.64
Setting Fence Rail on Metal Posts					
Stringing 2" x 4" wood fence rail between metal posts, including 2" x 4" pressure treated rail at \$.62 per linear foot and one 5" lag bolt connecting adjacent rail at each post.					
Measure opening between posts	BL@.010	Ea	—	.30	.30
Measure and cut two 10' rail	BL@.030	Ea	14.90	.90	15.80
Measure rail position on post	BL@.010	Ea	—	.30	.30
Drill 2 rail and metal tube post for lag bolt	BL@.167	Ea	—	5.00	5.00
Set two rail on tube post with lag bolt	BL@.133	Ea	1.14	3.98	5.12
Recheck level and adjust as needed	BL@.015	Ea	—	.45	.45
Paint cut ends, post connections, rail side	BL@.100	Ea	—	2.99	2.99
Set two rails, bolted in place, total	BL@.465	Ea	16.04	13.92	29.96
Set two rails, bolted in place, per LF of fence	BL@.047	LF	1.60	1.40	3.00
Installing Fence Face Board					
Hand nailing or stapling face board (pickets) to existing rail. Deduct 50% from labor costs for power nailing or power stapling. Includes measuring and cutting each picket, nailing or stapling to the top rail, plumbing with a level and nailing or stapling to the bottom rail. Two nails or staples at each rail. Cost per LF of fence. Based on 1" x 4" x 6', 1" x 6" x 6' and 1" x 8" x 6' face boards. Face board costs vary widely.					
Nailing 4" wide pressure treated southern pine fence face board (3.4 per LF of fence)					
French gothic, 1" x 4" x 3-1/2"	BL@.102	LF	2.77	3.05	5.82
French gothic, 5/8" x 4" x 4"	BL@.102	LF	4.69	3.05	7.74
Dog-eared, 7/16" x 4" x 6"	BL@.136	LF	3.90	4.07	7.97
Dog-eared, 1" x 4", 6'	BL@.136	LF	5.87	4.07	9.94
Nailing 5-1/2" wide pressure treated southern pine fence face board (2.4 per LF of fence)					
Dog-eared, 5/8" x 5-1/2" x 6"	BL@.120	LF	3.79	3.59	7.38
Nailing 6" wide pressure treated southern pine fence face board (2.2 per LF of fence)					
Dog-eared, 1" x 6" x 6'	BL@.110	LF	4.60	3.29	7.89
Dog-eared premium S4S, 1" x 6" x 6"	BL@.110	LF	5.26	3.29	8.55
Full cut premium, 1" x 6" x 6"	BL@.110	LF	4.95	3.29	8.24
Dog-eared, 5/8" x 5-1/2" x 8"	BL@.110	LF	5.83	3.29	9.12
Nailing 4" wide white wood fence face board (3.4 per LF of fence)					
Gothic, 3/4" x 4" x 6'	BL@.136	LF	5.90	4.07	9.97
Flat top, 1" x 4" x 6"	BL@.136	LF	6.02	4.07	10.09
Dog-eared, 1" x 4" x 6'	BL@.136	LF	6.43	4.07	10.50
Dog-eared, 1" x 4" x 8'	BL@.136	LF	6.36	4.07	10.43

Fencing, Wood

	Craft@Hrs	Unit	Material	Labor	Total
Nailing 4" wide cedar fence face board (3.4 per LF of fence)					
Dog-eared, No. 2, 3/4" x 4" x 8'	BL@.136	LF	8.77	4.07	12.84
Gothic, 3/4" x 4" x 6'	BL@.136	LF	6.73	4.07	10.80
Dog-eared, 9/16" x 4" x 6'	BL@.136	LF	6.15	4.07	10.22
Flat top, full-cut, 1" x 4" x 6'	BL@.136	LF	9.59	4.07	13.66
No. 1 flat top, full-cut, 1" x 4" x 8'	BL@.136	LF	11.70	4.07	15.77
Nailing 6" wide cedar fence face board (2.2 per LF of fence)					
Dog-eared, No. 2, 9/16" x 6" x 6'	BL@.110	LF	5.78	3.29	9.07
Dog-eared, No. 2, 9/16" x 6" x 8'	BL@.110	LF	10.10	3.29	13.39
Dog-eared, clear, 1" x 6" x 6'	BL@.110	LF	7.47	3.29	10.76
Flat top, full-cut, 1" x 6" x 6'	BL@.110	LF	7.53	3.29	10.82
Nailing 4" wide dog-eared common redwood fence face board (3.4 per LF of fence)					
3/4" x 4" x 6'	BL@.136	LF	6.53	4.07	10.60
Nailing 6" wide dog-eared common redwood fence face board (2.2 per LF of fence)					
3/4" x 6" x 5'	BL@.110	LF	4.10	3.29	7.39
3/4" x 6" x 6'	BL@.110	LF	6.71	3.29	10.00
3/4" x 6" x 6'	BL@.110	LF	7.91	3.29	11.20
Nailing 8" wide dog-eared common redwood fence face board (1.6 per LF of fence)					
3/4" x 8" x 6'	BL@.088	LF	8.30	2.63	10.93
3/4" x 8" x 6' Premium Const. Heart	BL@.088	LF	11.30	2.63	13.93
1" x 8" x 8'	BL@.088	LF	15.20	2.63	17.83
Nailing 10" wide dog-eared common redwood fence face board (1.3 per LF of fence)					
3/4" x 10" x 5'	BL@.072	LF	8.13	2.15	10.28
3/4" x 10" x 6'	BL@.072	LF	8.61	2.15	10.76
Nailing 12" wide dog-eared common redwood fence face board (1.05 per LF of fence)					
3/4" x 12" x 5' Rough	BL@.063	LF	8.56	1.89	10.45
3/4" x 12" x 6'	BL@.063	LF	9.61	1.89	11.50
Nailing 6" wide flat top redwood fence face board (2.2 per LF of fence)					
3/4" x 6" x 6' Const. Heart	BL@.110	LF	8.52	3.29	11.81
3/4" x 6" x 6' Merch. and Better	BL@.110	LF	8.28	3.29	11.57
3/4" x 6" x 6' Ridge Valley Redwood	BL@.110	LF	12.50	3.29	15.79
3/4" x 6" x 8' Ridge Valley Redwood	BL@.110	LF	20.90	3.29	24.19
Nailing 8" wide flat top redwood fence face board (1.6 per LF of fence)					
3/4" x 8" x 5'	BL@.088	LF	6.29	2.63	8.92
3/4" x 8" x 5' T&G	BL@.088	LF	8.34	2.63	10.97
3/4" x 8" x 6'	BL@.088	LF	7.21	2.63	9.84
3/4" x 8" x 6' Construction Heart	BL@.088	LF	12.50	2.63	15.13
1" x 8" x 8' Construction Heart	BL@.088	LF	15.20	2.63	17.83
Nailing 10" and 12" wide flat top redwood fence face board (1.3 per LF of fence for 10", 1.0 for 12")					
3/4" x 10" x 8' Redwood	BL@.072	LF	11.00	2.15	13.15
3/4" x 12" x 6' Dog-eared	BL@.072	LF	9.15	2.15	11.30
Deduct for power stapling or power nailing	—	%	—	-50.0	—

Building a Fence on a Hillside

Post hole excavation, post setting and fence erection will take longer when the site is obstructed or on a hillside. Adjust manhours as follows for sloping terrain.

Add for slope to 4 in 12	—	%	—	20.0	—
Add for slope over 4 in 12 to 8 in 12	—	%	—	50.0	—
Add for slope over 8 in 12 to 12 in 12	—	%	—	100.0	—

Fencing, Wood

	Craft@Hrs	Unit	Material	Labor	Total
Build and Hang a Wood Fence Gate 5' high by 3' wide wood gate, 2" x 4" frame . Add the cost of fence posts from above. Add fence face boards from above. Units are for each gate.					
Measure, design and lay out gate	BL@.200	Ea	—	5.99	5.99
Measure and cut frame (11' x 2" x 4")	BL@.050	Ea	6.83	1.50	8.33
Nail frame together	BL@.100	Ea	.10	2.99	3.09
Square up and measure 4' diagonal brace	BL@.050	Ea	2.48	1.50	3.98
Cut cross brace and nail in place	BL@.083	Ea	.08	2.48	2.56
Square up and add metal corner brackets	BL@.333	Ea	1.25	9.97	11.22
Mark top pattern on face boards	BL@.133	Ea	—	3.98	3.98
Cut top pattern on face boards	BL@.089	Ea	—	2.66	2.66
Set hinges on gate and fence post	BL@.250	Ea	7.85	7.48	15.33
Set latch on gate and strike on fence post	BL@.100	Ea	6.94	2.99	9.93
Check and adjust as needed	BL@.125	Ea	—	3.74	3.74
Build and hang wood fence gate, total	BL@1.51	Ea	25.53	45.28	70.81

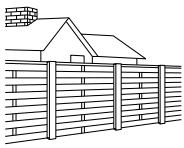
Fence Assemblies, Wood Costs shown include excavation of post holes, concrete and labor to set posts, attaching rails with nails or lag bolts, and hand nailing of face boards where applicable. See additional costs at the end of this section.

Basketweave fence, redwood, "B" grade, 1" x 6" boards, 2" x 4" stringers or spreaders, 4" x 4" posts

Tight weave, 4' high, posts at 4' OC	B1@.332	LF	12.30	11.10	23.40
Tight weave, 6' high, posts at 4' OC	B1@.522	LF	9.84	17.50	27.34
Wide span, 4' high, posts at 8' OC	B1@.291	LF	5.64	9.73	15.37
Wide span, 8' high, posts at 8' OC	B1@.481	LF	7.37	16.10	23.47
4' high gate, tight weave	B1@.906	Ea	53.90	30.30	84.20
4' high gate, wide span	B1@.906	Ea	43.30	30.30	73.60
6' high gate, tight weave	B1@1.11	Ea	24.80	37.10	61.90
8' high gate, wide span	B1@1.26	Ea	32.40	42.10	74.50

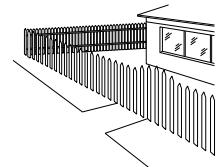
Board fence, using 4" wide boards, hand nailed, posts at 10' OC

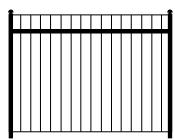
Pressure treated Southern Pine, 1" x 4" boards					
6' high, 2 rail, wood posts	B1@.267	LF	5.91	8.93	14.84
6' high, 2 rail, metal posts	B1@.276	LF	6.98	9.23	16.21
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Cedar, 1" x 4" boards					
6' high, 2 rail, wood posts	B1@.267	LF	10.90	8.93	19.83
8' high, 2 rail, wood posts	B1@.267	LF	12.80	8.93	21.73
6' high, 2 rail, metal posts	B1@.276	LF	12.00	9.23	21.23
8' high, 2 rail, metal posts	B1@.276	LF	13.80	9.23	23.03
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Redwood, 3/4" x 4" boards					
6' high, 2 rail, wood posts	B1@.267	LF	8.22	8.93	17.15
6' high, 2 rail, metal posts	B1@.276	LF	9.29	9.23	18.52
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Whitewoods, 1" x 4" boards					
6' high, 2 rail, wood posts	B1@.267	LF	7.77	8.93	16.70
8' high, 2 rail, wood posts	B1@.267	LF	8.07	8.93	17.00
6' high, 2 rail, metal posts	B1@.276	LF	8.84	9.23	18.07
8' high, 2 rail, metal posts	B1@.276	LF	9.14	9.23	18.37
Deduct for power stapling or power nailing	—	%	—	-22.0	—



Fencing, Wood

	Craft@Hrs	Unit	Material	Labor	Total
Board fence, using 6" wide boards, hand nailed, posts at 10' OC					
Pressure treated Southern Pine, 1" x 6" boards					
6' high, 2 rail, wood posts	B1@.241	LF	6.96	8.06	15.02
8' high, 2 rail, wood posts	B1@.241	LF	7.76	8.06	15.82
6' high, 2 rail, metal posts	B1@.250	LF	8.03	8.36	16.39
8' high, 2 rail, metal posts	B1@.250	LF	8.83	8.36	17.19
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Cedar, 9/16" x 6" boards					
6' high, 2 rail, wood posts	B1@.241	LF	7.72	8.06	15.78
8' high, 2 rail, wood posts	B1@.241	LF	11.60	8.06	19.66
6' high, 2 rail, metal posts	B1@.250	LF	8.79	8.36	17.15
8' high, 2 rail, metal posts	B1@.250	LF	12.70	8.36	21.06
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Redwood, 3/4" x 6" boards					
6' high, 2 rail, wood posts	B1@.241	LF	13.80	8.06	21.86
8' high, 2 rail, wood posts	B1@.241	LF	15.30	8.06	23.36
6' high, 2 rail, metal posts	B1@.250	LF	14.90	8.36	23.26
8' high, 2 rail, metal posts	B1@.250	LF	22.50	8.36	30.86
Deduct for power stapling or power nailing	—	%	—	-22.0	—
Split-rail fence, red cedar, 4" posts at 8' OC					
Split 2" x 4" rails, 3' high, 2 rail	B1@.095	LF	2.85	3.18	6.03
Split 2" x 4" rails, 4' high, 3 rail	B1@.102	LF	3.67	3.41	7.08
Rustic 4" round, 3' high, 2 rail	B1@.095	LF	3.42	3.18	6.60
Rustic 4" round, 4' high, 3 rail	B1@.102	LF	4.43	3.41	7.84
Picket fence, 1" x 2" pickets, 2" x 4" rails, 4" x 4" posts at 8' OC					
Pressure treated Southern Pine					
3' high, 2 rail	B1@.270	LF	2.09	9.03	11.12
5' high, 3 rail	B1@.385	LF	2.84	12.90	15.74
3' high gate	B1@.770	Ea	9.11	25.70	34.81
5' high gate	B1@.887	Ea	12.50	29.70	42.20
Red cedar, #3 & Better					
3' high, 2 rail	B1@.270	LF	4.33	9.03	13.36
5' high, 3 rail	B1@.385	LF	5.94	12.90	18.84
3' high gate	B1@.770	Ea	19.00	25.70	44.70
5' high gate	B1@.887	Ea	26.10	29.70	55.80
Redwood, B grade					
3' high, 2 rail	B1@.270	LF	4.65	9.03	13.68
5' high, 3 rail	B1@.385	LF	6.07	12.90	18.97
3' high gate	B1@.770	Ea	20.40	25.70	46.10
5' high gate	B1@.887	Ea	26.60	29.70	56.30
Picket fence gate hardware					
Latch, standard duty	B1@.281	Ea	4.24	9.40	13.64
Latch, heavy duty	B1@.281	Ea	14.00	9.40	23.40
Slide bolt	B1@.281	Ea	4.48	9.40	13.88
Hinges, standard, per pair	B1@.374	Pr	7.34	12.50	19.84
Hinges, heavy duty, per pair	B1@.374	Pr	9.94	12.50	22.44
No-sag cable kit	B1@.281	Ea	13.10	9.40	22.50
Self closing spring	B1@.281	Ea	13.00	9.40	22.40



Fencing, Aluminum

	Craft@Hrs	Unit	Material	Labor	Total
Fencing, Aluminum					
Decorative aluminum, 72-1/2" panel width, 2" x 2" posts, .060" wall thickness, 3-13/16" picket spacing, 1" x .055" top rail with 1-1/2" x .082" sides. Pre-routed holes in posts. Gates include hardware. Pool code compliant model has 48" space between horizontal rails					
48" high panel	BL@.170	Ea	62.00	5.09	67.09
54" pool code compliant panel	BL@.170	Ea	69.00	5.09	74.09
60" high panel	BL@.170	Ea	70.00	5.09	75.09
72" high panel	BL@.170	Ea	88.00	5.09	93.09
Fence posts					
48" high	BL@.830	Ea	23.00	24.80	47.80
54" high	BL@.830	Ea	24.00	24.80	48.80
60" high	BL@.830	Ea	25.00	24.80	49.80
72" high	BL@.830	Ea	28.00	24.80	52.80
Single swing gates, 5' wide					
48" high	BL@.175	Ea	184.00	5.24	189.24
54" high	BL@.175	Ea	196.00	5.24	201.24
60" high	BL@.175	Ea	158.00	5.24	163.24
72" high	BL@.175	Ea	179.00	5.24	184.24
Gate posts					
48" high	BL@.830	Ea	35.00	24.80	59.80
54" high	BL@.830	Ea	41.00	24.80	65.80
60" high	BL@.830	Ea	48.00	24.80	72.80
72" high	BL@.830	Ea	46.00	24.80	70.80
Add for setting post in concrete	BL@.330	Ea	3.03	9.88	12.91

Fencing, Vinyl

Costs shown include concrete and labor to set posts.

Vinyl picket fence, 1-1/2" pickets with 2" spacing, 2 rail, 2" x 4" rails, 4" x 4" posts at 8' OC, pre-assembled in 8' sections. Prices include post mounts, post top, screws and one post.

4' high	B1@.110	LF	11.60	3.68	15.28
Gate with 4" posts	B1@1.00	Ea	271.00	33.40	304.40
Add for additional fence post with top	B1@.500	Ea	20.60	16.70	37.30

Vinyl picket fence, 3-1/2" pickets with 3" spacing, 2 rail, 2" x 4" rails, 4" x 4" posts at 6' OC, pre-assembled in 6' sections. Prices include post mounts, post top, screws and one post.

4' high	B1@.110	LF	11.60	3.68	15.28
Gate with 4" posts	B1@1.00	Ea	262.00	33.40	295.40
Add for additional fence post with top	B1@.500	Ea	19.90	16.70	36.60

Vinyl shadowbox fence, 5-1/2" offset pickets, 3 rail, with galvanized steel support, posts at 71" OC. Prices include post mounts, post top, screws and one post.

4' high	B1@.130	LF	27.20	4.35	31.55
5' high	B1@.140	LF	28.90	4.68	33.58
6' high	B1@.140	LF	30.70	4.68	35.38
Gate with 4" posts	B1@1.20	Ea	476.00	40.10	516.10
Add for additional fence post with top	B1@.500	Ea	35.50	16.70	52.20

Vinyl privacy fence, 6" boards, 3 rail, posts at 6' OC. Prices include post mounts, post top, screws and one post.

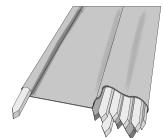
6' high	B1@.140	LF	23.80	4.68	28.48
6' x 44" high gate	B1@1.20	Ea	352.00	40.10	392.10
Add for additional fence post with top	B1@.500	Ea	24.70	16.70	41.40

Vinyl post & rail fence, 2" x 6" x 96" notched rail, posts 8' OC. Includes post mounts, post top, and one post.

42" high, 2 rail, 4" routed post	B1@.110	LF	2.48	3.68	6.16
48" high, 3 rail, 4" routed post	B1@.120	LF	3.31	4.01	7.32
54" high, 4 rail, 5" routed post	B1@.120	LF	4.41	4.01	8.42
48" gate with 4" posts	B1@1.00	Ea	250.00	33.40	283.40
60" gate with 5" posts	B1@1.00	Ea	280.00	33.40	313.40
Add for additional 4" fence post with top	B1@.500	Ea	31.60	16.70	48.30
Add for additional 5" fence post with top	B1@.500	Ea	32.60	16.70	49.30

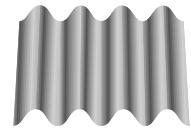
Fire Sprinkler Systems

	Craft@Hrs	Unit	Material	Labor	Total
Silt fence , black 6 mil poly with stakes 8' OC, staked and buried 9" deep 3' high, 100 LF roll	BL@.030	LF	.33	.90	1.23



Fiberglass Panels Nailed or screwed onto wood frame.
Corrugated, 8', 10', 12' panels, 2-1/2" corrugations, standard colors. Costs include 10% loss for coverage and waste.

Polycarbonate, 26" wide, gray or white	BC@.012	SF	1.33	.44	1.77
Polycarbonate, 26" wide, clear	BC@.012	SF	1.33	.44	1.77
PVC, 26" wide panels	BC@.012	SF	.92	.44	1.36
Flat panels, clear, green or white					
.06" flat sheets, 4' x 8', 10', 12'	BC@.012	SF	1.17	.44	1.61
.03" rolls, 24", 36", 48" x 50"	BC@.012	SF	1.25	.44	1.69
.037" rolls, 24", 36", 48" x 50"	BC@.012	SF	1.44	.44	1.88

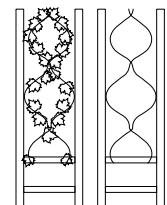


Accessories

Nails, ring shank with rubber washer, 1-3/4" (labor included with panels)					
100 per box (covers 130 SF)	—	SF	.08	—	.08
Self-tapping screws, 1-1/4", rust-proof (labor included with panels)					
100 per box (covers 130 SF)	—	SF	.30	—	.30
Horizontal closure strips, corrugated (labor included with panels)					
Redwood, 2-1/2" x 1-1/2"	—	LF	.32	—	.32
Poly-foam, 1" x 1"	—	LF	.55	—	.55
Rubber, 1" x 1"	—	LF	.46	—	.46
Vertical crown molding					
Redwood, 1-1/2" x 1" or poly-foam, 1" x 1"	—	LF	.33	—	.33
Rubber, 1" x 1"	—	LF	.85	—	.85
Ridge cap, covers the joint where panels meet at the roof peak					
Polycarbonate, 48" long	—	LF	5.52	—	5.52

Ornamental Iron, Railings and Fence, Subcontract Typical prices, fabricated, delivered and installed.

Handrail, 1-1/2" x 1" rectangular top rail tubing, 1" square bottom rail tubing, 1/2" square pickets with 5-1/2" space between					
36" high railing for single family dwelling	—	LF	—	—	38.90
42" high apartment style railing	—	LF	—	—	31.00
Add for inclined runs	—	LF	—	—	7.14
Pool fence					
5' high, 4-1/2" centers	—	LF	—	—	38.90
Add for gate, with self-closer and latch	—	LS	—	—	183.00



Fire Sprinkler Systems, Subcontract Systems installed in new residences not over four stories high in accord with NFPA 13D and 13R. Includes hydraulic design, typical permits and tap fees (\$350), connection to a domestic water line, exposed riser with shut-off and drain valves, flow switch, alarm, backflow preventer and inspection of the completed system. Using CPVC or PEX concealed pipe and residential sprinkler heads. Per SF of protected area, including closets, attached garage, attic and basement when required. For scheduling purposes, estimate that a crew of 2 can install the rough-in piping for 1,500 to 1,600 SF of protected area in an 8-hour day and about the same amount of finish work in another 8-hour day.

Fabricate, install, and test system					
Single residence, slab foundation	—	SF	—	—	1.59
Single residence, crawl space foundation	—	SF	—	—	1.83
Single residence with basement	—	SF	—	—	1.97
Tract work or multi-family residence	—	SF	—	—	1.68
Add if copper pipe is required	—	SF	—	—	1.97
Add if a booster pump is required (well water)	—	LS	—	—	3,400.00

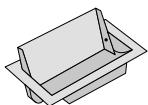
Craft@Hrs	Unit	Material	Labor	Total
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Masonry Fireplaces

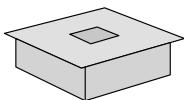
Fire box lined with refractory firebrick, backed with common brick and enclosed in a common brick wall. Includes fireplace throat and smoke chamber. Overall height of the fireplace and throat is 5'. Chimney (flue) is made from common brick and a flue liner. Including lintels, damper and 12" thick reinforced concrete foundation. For more on masonry fireplaces, see *National Concrete & Masonry Estimator*, <http://CraftsmanSiteLicense.com>.

30" wide x 29" high x 16" deep fire box	B9@39.7	LS	649.00	1,300.00	1,949.00
36" wide x 29" high x 16" deep fire box	B9@43.5	LS	684.00	1,420.00	2,104.00
42" wide x 32" high x 16" deep fire box	B9@48.3	LS	756.00	1,580.00	2,336.00
48" wide x 32" high x 18" deep fire box	B9@52.8	LS	831.00	1,720.00	2,551.00
12" x 12" chimney to 12' high	B9@9.50	LS	384.00	310.00	694.00
Add for higher chimney, per LF	B9@1.30	LF	52.40	42.40	94.80
Add for 8" x 10" ash cleanout door	B9@.500	SF	20.80	16.30	37.10
Add for combustion air inlet kit	B9@.750	SF	31.30	24.50	55.80
Add for common brick veneer interior face	B9@.451	SF	4.80	14.70	19.50
Add for rubble or cobble stone veneer face	B9@.480	SF	13.10	15.70	28.80
Add for limestone veneer face or hearth	B9@.451	SF	24.80	14.70	39.50
Add for 1-1/4" marble face or hearth	B9@.451	SF	37.30	14.70	52.00
Add for modern design 11" x 77" pine mantel	B1@3.81	Ea	735.00	127.00	862.00
Add for gas valve, log lighter and key	PM@.750	Ea	84.60	32.10	116.70

Angle iron (lintel support), lengths 25" to 96"
3" x 3" x 3/16"



Ash drops, cast iron top, galvanized container
16-3/4" x 12-1/2" x 8"

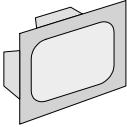


Ash dumps, cast iron
5-3/8" x 9-1/2" overall
5-3/8" x 9-1/2" overall, vented

Chimney anchors, per pair

48" x 1-1/2" x 3/16"

72" x 1-1/2" x 3/16"

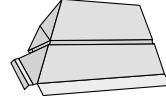


Cleanout doors, cast iron, overall dimensions

8" wide x 8" high

12" wide x 10" high

12" wide x 12" high



Dampers for single opening firebox, heavy steel with rockwool insulation

14" high, 25" to 30" wide, 10" deep, 25 lbs

14" high, 36" wide, 10" deep, 31 lbs

14" high, 42" wide, 10" deep, 38 lbs

14" high, 48" wide, 10" deep, 43 lbs

16" high, 54" wide, 13" deep, 66 lbs

16" high, 60" wide, 13" deep, 74 lbs

16" high, 72" wide, 13" deep, 87 lbs

B9@1.33 Ea 68.70 43.40 112.10

B9@1.33 Ea 74.40 43.40 117.80

B9@1.33 Ea 91.00 43.40 134.40

B9@1.75 Ea 117.00 57.10 174.10

B9@2.50 Ea 202.00 81.60 283.60

B9@2.50 Ea 243.00 81.60 324.60

B9@2.50 Ea 292.00 81.60 373.60

Dampers for multiple opening or corner opening firebox, high capacity, steel downdraft shelf support

35" wide

41" wide

47" wide

B9@1.33 Ea 282.00 43.40 325.40

B9@1.33 Ea 321.00 43.40 364.40

B9@1.75 Ea 412.00 57.10 469.10

Chimney-top dampers, with cable to the firebox and handle mount, aluminum, by flue size

8" x 8"

8" x 13"

8" x 17"

13" x 13"

13" x 17"

17" x 17"

B9@1.33 Ea 172.00 43.40 215.40

B9@1.33 Ea 175.00 43.40 218.40

B9@1.33 Ea 189.00 43.40 232.40

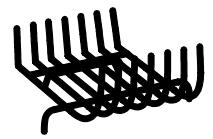
B9@1.75 Ea 180.00 57.10 237.10

B9@2.50 Ea 211.00 81.60 292.60

B9@2.50 Ea 259.00 81.60 340.60

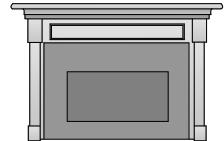
Fireplaces

	Craft@Hrs	Unit	Material	Labor	Total
Fuel grates					
21" x 16"	—	Ea	64.50	—	64.50
29" x 16"	—	Ea	82.50	—	82.50
40" x 30"	—	Ea	127.00	—	127.00



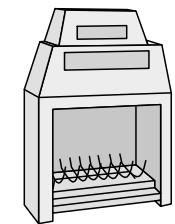
Factory-built wood-burning fireplaces Including refractory-lined firebox, fireplace front, combustion air kit and damper with control. By hearth opening width. 21" depth overall.

36" wide	B9@3.50	Ea	689.00	114.00	803.00
42" wide	B9@3.50	Ea	1,060.00	114.00	1,174.00
50" wide	B9@4.00	Ea	3,020.00	130.00	3,150.00
36" wide, 1 open end	B9@3.50	Ea	1,490.00	114.00	1,604.00
36" wide, 3 open sides	B9@4.00	Ea	2,290.00	130.00	2,420.00
36" wide, see-through	B9@4.00	Ea	2,190.00	130.00	2,320.00
25" wide, EPA Phase II compliant	B9@4.00	Ea	5,550.00	130.00	5,680.00
Add for 8" Class A vent, per vertical foot	B9@.250	LF	78.40	8.16	86.56



Gas-burning direct vent zero clearance fireplaces Vents directly through an exterior wall or the roof using sealed double chamber vent pipe. See vent pipe costs below. Waste gases exit through the vent inner chamber. Outside air enters the firebox through the vent outside chamber. Framing may be applied directly against the unit. Circulates heated air into the room. Includes brick firebox, fireplace front, bi-fold glass doors, temperature control, masonry logs and fuel grate. Electric ignition. Overall dimensions.

36" high x 33" wide x 19" deep	B9@3.50	Ea	1,980.00	114.00	2,094.00
43" high x 39" wide x 19" deep	B9@3.50	Ea	1,590.00	114.00	1,704.00
42" high x 36" wide x 23" deep	B9@3.50	Ea	2,550.00	114.00	2,664.00
41" high x 36" wide x 19" deep, 1 open end	B9@3.50	Ea	4,130.00	114.00	4,244.00
40" high x 36" wide x 19" deep, 2 open ends	B9@4.00	Ea	3,500.00	130.00	3,630.00
37" high x 44" wide x 24" deep, see-through	B9@4.00	Ea	4,050.00	130.00	4,180.00
Deduct for conventional B-vent units	—	Ea	-174.00	—	-174.00



Direct vent fireplace flue (chimney), double wall, typical cost for straight vertical installation

4" inside diameter 6-5/8" outside diameter	B9@.167	LF	12.60	5.45	18.05
5" inside diameter, 8" outside diameter	B9@.167	LF	15.60	5.45	21.05
Flue spacers, for passing through ceiling					
1" or 2" clearance	B9@.167	Ea	13.70	5.45	19.15
Typical flue offset	B9@.250	Ea	86.50	8.16	94.66
Flashing and storm collar, one required per roof penetration					
Flat to 6/12 pitch roofs	B9@3.25	Ea	55.00	106.00	161.00
6/12 to 12/12 pitch roofs	B9@3.25	Ea	80.00	106.00	186.00
Spark arrestor top	B9@.500	Ea	112.00	16.30	128.30

Blower kit for heat-circulating fireplace, requires 110 volt electrical receptacle outlet (electrical wiring not included)

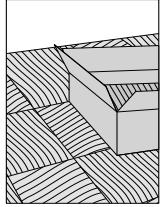
Blower unit for connection to existing outlet	B9@.500	Ea	110.00	16.30	126.30
Add variable speed and thermostatic control	B9@.100	Ea	80.20	3.26	83.46

Electric fireplaces, built-in Prefabricated, 120 volt, including grate, ember bed, interior face, thermostat, brightness control and logs.

20" wide opening, 120 volt, 1,500 watts	B9@2.50	Ea	699.00	81.60	780.60
26" wide opening, 120 volt, 1,500 watts	B9@2.50	Ea	899.00	81.60	980.60

Flooring, Vinyl Sheet

	Craft@Hrs	Unit	Material	Labor	Total
Sheet Vinyl Flooring					
Armstrong sheet vinyl flooring. By Performance Appearance Rating (PAR). Bonded with adhesive at perimeter and at seams. Including 10% waste and adhesive.					
Medley, urethane wear layer, 15 year	BF@.250	SY	21.30	8.45	29.75
Caspian, PAR 3.8, urethane wear layer, 15 year	BF@.250	SY	17.20	8.45	25.65
Themes, PAR 2.9, urethane wear layer, 10 year	BF@.250	SY	13.20	8.45	21.65
Sundial, urethane wear layer, .098", 10 year	BF@.250	SY	14.50	8.45	22.95
Metro, PAR 2.3, vinyl wear layer, 5 year	BF@.250	SY	7.57	8.45	16.02
Cambray FHA, PAR 1.7, vinyl wear layer, 5 year	BF@.250	SY	7.57	8.45	16.02
Memories, 12 year	BF@.250	SY	25.10	8.45	33.55
Successor, 10 year	BF@.250	SY	18.90	8.45	27.35
Enhancements, 6 year	BF@.250	SY	19.20	8.45	27.65
Initiator, 5 year	BF@.250	SY	13.00	8.45	21.45
Sentinel, 5 year	BF@.250	SY	10.60	8.45	19.05
Apartment One, 1 year	BF@.250	SY	10.40	8.45	18.85
Royelle, PAR 1.3, vinyl wear layer, 1 year	BF@.250	SY	5.26	8.45	13.71
Tarkett sheet vinyl, bonded with adhesive at perimeter and at seams. Including 10% waste and adhesive.					
Simply Brite	BF@.250	SY	31.10	8.45	39.55
Signature	BF@.250	SY	26.90	8.45	35.35
Naturelle	BF@.250	SY	26.30	8.45	34.75
Presence Felt	BF@.250	SY	20.60	8.45	29.05
Style Brite Flex	BF@.250	SY	17.70	8.45	26.15
Style Brite Felt	BF@.250	SY	17.60	8.45	26.05
Simply Brite Felt	BF@.250	SY	17.40	8.45	25.85
Fiber Floor	BF@.250	SY	10.40	8.45	18.85
Sierra	BF@.250	SY	9.36	8.45	17.81
Yosemite	BF@.250	SY	8.42	8.45	16.87
Preference	BF@.250	SY	7.37	8.45	15.82
Sandran	BF@.250	SY	4.89	8.45	13.34
Sheet vinyl, no wax, Mannington. Bonded with adhesive at perimeter and at seams. Including 10% waste and adhesive.					
Gold Series	BF@.250	SY	46.20	8.45	54.65
Silver Series	BF@.250	SY	32.90	8.45	41.35
Bronze Series	BF@.250	SY	32.90	8.45	41.35
Villa Series	BF@.250	SY	23.60	8.45	32.05
Ceramica	BF@.250	SY	29.50	8.45	37.95
Silverado	BF@.250	SY	26.70	8.45	35.15
Aurora	BF@.250	SY	23.80	8.45	32.25
Lumina	BF@.250	SY	19.70	8.45	28.15
Vega II, Omni	BF@.250	SY	15.40	8.45	23.85
Vinyl 12" x 12" Tile Flooring					
Armstrong vinyl tile, 12" x 12", including 10% waste and adhesive					
Solarian Stonegate, .094"	BF@.023	SF	3.34	.78	4.12
Natural Images, .094"	BF@.023	SF	3.34	.78	4.12
Chelsea (urethane), .08"	BF@.023	SF	2.67	.78	3.45
Chesapeake (urethane), .08"	BF@.023	SF	2.17	.78	2.95
Harbour, .08"	BF@.023	SF	2.06	.78	2.84
StoneTex, 1/8"	BF@.021	SF	1.86	.71	2.57
Stylistik, .065", self-adhesive	BF@.023	SF	1.48	.78	2.26
Themes, .08" (urethane)	BF@.023	SF	1.51	.78	2.29
Vernay, Metro, .045"	BF@.023	SF	1.26	.78	2.04
MultiColor, 1/8"	BF@.021	SF	1.07	.71	1.78



Flooring, Vinyl Tile

	Craft@Hrs	Unit	Material	Labor	Total
Excelon Civic Square, 1/8"	BF@.021	SF	.80	.71	1.51
Afton, .075"	BF@.023	SF	1.37	.78	2.15
Builder urethane, .080", self-adhesive	BF@.023	SF	2.28	.78	3.06
Builder urethane, .080", dry back	BF@.023	SF	2.17	.78	2.95
Elegant Images™ Series vinyl floor tile, Armstrong. 12" x 12". ToughGuard® durability. Resists stains, scratches, scuffs and indentations. 25-year warranty. Per square foot, including adhesive and 10% waste.					
Cornwall, Burnt Almond	BF@.023	SF	2.82	.78	3.60
Modern, Rose/Green Inset	BF@.023	SF	1.90	.78	2.68
Rubber studded tile. 12" x 12". Highly resilient to reduce fatigue. 10-year wear warranty. Slip-resistant. Sound absorbent. High abrasion resistance. For kitchens and utility rooms.					
All colors	BF@.025	SF	8.25	.84	9.09

Vinyl Flooring Accessories

Resilient flooring adhesive

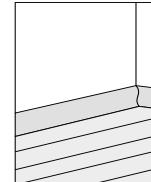
Sheet vinyl adhesive, per gallon	—	Gal	20.00	—	20.00
Sheet vinyl adhesive, 71 SF per gallon	—	SF	.31	—	.31
Vinyl tile adhesive, per gallon	—	Gal	30.50	—	30.50
Vinyl tile adhesive, 190 SF per gallon	—	SF	.18	—	.18
Vinyl seam sealer kit (100 LF)	—	LF	.12	—	.12

Resilient flooring accessories

Self-leveling compound					
1 pound per SF at .25" depth	BF@.016	SF	.77	.54	1.31
Latex primer (used over dusting, porous or below grade concrete)					
400 SF per gallon	BF@.008	SF	.03	.27	.30
Liquid underlayment (application over existing vinyl floor)					
Gallon covers 75 SF	BF@.010	SF	.40	.34	.74
Lining felt, 15 Lb. asphalt felt (used over board subfloor)					
432 SF roll covers 350 SF	BF@.004	SF	.05	.14	.19
Tempered hardboard underlayment (levels uneven subfloor)					
1/8" x 4' x 8' sheet	BF@.016	SF	.46	.54	1.00

Cove base, colors,

2-1/2" high, .08" thick	BF@.025	LF	1.14	.84	1.98
4" high, .08" thick	BF@.025	LF	.69	.84	1.53
4" high, self-adhesive	BF@.016	LF	1.04	.54	1.58



Cove base cement

105 LF of 4" base per quart	—	LF	.07	—	.07
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Accent strip, 1/8" x 24" long

1/2" wide	BF@.025	LF	.36	.84	1.20
1" wide	BF@.025	LF	.46	.84	1.30
2" wide	BF@.025	LF	.86	.84	1.70

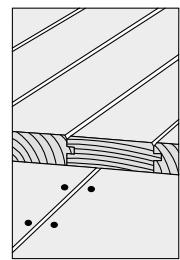
Vinyl edging strip, 1" wide

1/16" thick	—	LF	.60	—	.60
1/8" thick	—	LF	.75	—	.75

Wood Strip Flooring

Unfinished tongue and groove 3/4" x 2-1/4" strip flooring. Bundle covers 19.5 square feet. See installation, sanding and finishing cost below.

Select red oak, 19.5 SF per bundle	—	SF	3.99	—	3.99
Select white oak, 19.5 SF per bundle	—	SF	3.77	—	3.77
No. 1 common red oak, 19.5 SF per bundle	—	SF	3.69	—	3.69
No. 1 common white oak, 19.5 SF per bundle	—	SF	3.38	—	3.38
No. 2 common red oak, 19.5 SF per bundle	—	SF	3.25	—	3.25
Select ash, 19.5 SF per bundle	—	SF	3.76	—	3.76



Flooring, Wood Strip

	Craft@Hrs	Unit	Material	Labor	Total
Red oak stair nosing, 3/4"	—	LF	5.84	—	5.84
Red oak reducer strip, 3/4" x 2"	—	LF	2.68	—	2.68
Red oak quarter round, 3/4" x 3/4"	—	LF	.94	—	.94
Labor installing, sanding and finishing hardwood strip flooring on a prepared subfloor. Nailed in place.					
Install 1-1/2" width strips	BF@.066	SF	—	2.23	2.23
Install 2" or 2-1/4" width strips	BF@.062	SF	—	2.09	2.09
Install 3-1/4" width strips	BF@.060	SF	—	2.03	2.03
Install stair nose or reducer strip	BF@.040	LF	—	1.35	1.35
Sanding, 3 passes (60/80/100 grit)	BF@.023	SF	.08	.78	.86
2 coats of stain/sealer	BF@.010	SF	.12	.34	.46
2 coats of urethane	BF@.012	SF	.15	.41	.56
2 coats of lacquer	BF@.024	SF	.20	.81	1.01

Unfinished antique tongue and groove plank flooring 25/32" thick, random widths and lengths.

Includes typical cutting waste. Installed over a prepared subfloor.

Ash, select, 3" to 7" wide	BF@.057	SF	5.19	1.93	7.12
Chestnut, American, 3" to 7" wide	BF@.057	SF	10.80	1.93	12.73
Chestnut, distressed, 3" to 7" wide	BF@.057	SF	12.80	1.93	14.73
Chestnut, distressed, over 7" wide	BF@.057	SF	16.60	1.93	18.53
Cherry, #1, 3" to 7" wide	BF@.057	SF	12.10	1.93	14.03
Cherry, #1, 6" wide and up	BF@.057	SF	14.70	1.93	16.63
Hickory, #1, 3" to 7" wide	BF@.057	SF	5.03	1.93	6.96
Hemlock, 3" to 7" wide	BF@.057	SF	8.68	1.93	10.61
Hemlock, over 7" wide	BF@.057	SF	11.30	1.93	13.23
Oak, #1, red or white, 3" to 7" wide	BF@.057	SF	4.54	1.93	6.47
Oak, #1, red or white, over 7" wide	BF@.057	SF	7.16	1.93	9.09
Oak, 3" to 7" wide	BF@.057	SF	9.08	1.93	11.01
Oak, over 7" wide	BF@.057	SF	11.00	1.93	12.93
Oak, distressed, 3" to 7" wide	BF@.057	SF	10.40	1.93	12.33
Oak, distressed, over 7" wide	BF@.057	SF	13.10	1.93	15.03
Maple, FAS, 3" to 7" wide	BF@.057	SF	6.26	1.93	8.19
Poplar, 3" to 8" wide	BF@.057	SF	4.49	1.93	6.42
Poplar, over 8" wide	BF@.057	SF	6.05	1.93	7.98
Walnut, #3, 3" to 7" wide	BF@.057	SF	7.30	1.93	9.23
White pine, 3" to 7"	BF@.057	SF	6.82	1.93	8.75
White pine, distressed, 3" to 7"	BF@.057	SF	7.43	1.93	9.36
White pine, distressed, over 7" wide	BF@.057	SF	10.70	1.93	12.63
White pine, knotty grade, 12" and up wide	BF@.057	SF	11.00	1.93	12.93
Yellow pine, 3" to 5" wide	BF@.057	SF	7.94	1.93	9.87
Yellow pine, 6" to 10" wide	BF@.057	SF	10.80	1.93	12.73

Unfinished northern hard maple strip flooring

25/32" x 2-1/4" (138.3 BF per 100 SF)

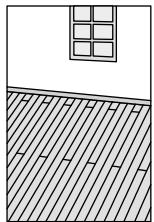
1st grade	BF@.036	SF	6.43	1.22	7.65
2nd grade	BF@.036	SF	5.75	1.22	6.97
3rd grade	BF@.036	SF	5.31	1.22	6.53

25/32" x 1-1/2" (155 BF per 100 SF)

1st grade	BF@.040	SF	7.67	1.35	9.02
2nd grade	BF@.040	SF	6.89	1.35	8.24
3rd grade	BF@.040	SF	6.36	1.35	7.71

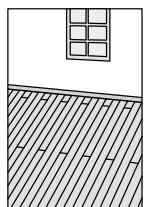
33/32" x 1-1/2" (170 BF per 100 SF)

1st grade	BF@.036	SF	7.14	1.22	8.36
2nd grade	BF@.036	SF	6.16	1.22	7.38
3rd grade	BF@.036	SF	5.79	1.22	7.01



Flooring, Wood Strip

	Craft@Hrs	Unit	Material	Labor	Total
Unfinished long plank flooring	Random 3" to 5" widths, 1' to 16' lengths, 3/4" thick.				
Select grade, ash	BF@.062	SF	6.64	2.09	8.73
Common grade, cherry	BF@.062	SF	8.78	2.09	10.87
Select grade, cherry	BF@.062	SF	11.00	2.09	13.09
Select grade, rock maple	BF@.062	SF	8.08	2.09	10.17
Select grade, figured maple	BF@.062	SF	13.90	2.09	15.99
Select grade, red oak	BF@.062	SF	9.08	2.09	11.17
Select grade, white oak	BF@.062	SF	7.48	2.09	9.57
Unfinished wide plank flooring	Random 6" to 8" widths, 1' to 16' lengths, 3/4" thick, including 8% waste, Specialty Wood Floors.				
Knotty grade, pine	BF@.074	SF	5.17	2.50	7.67
Select grade, cherry	BF@.074	SF	12.10	2.50	14.60
Select grade, maple	BF@.074	SF	10.90	2.50	13.40
Select grade, red oak	BF@.074	SF	10.10	2.50	12.60
Select grade, white oak	BF@.074	SF	9.15	2.50	11.65
Softwood flooring	Material costs include typical waste and coverage loss. Estimates for sanding and finishing appear at the end of this section.				
Unfinished Douglas fir, C Grade and better, dry, vertical grain flooring. 1.25 board feet cover 1 square foot including end cutting and typical waste.					
1" x 2", square edge	BF@.037	SF	3.75	1.25	5.00
1" x 3", square edge	BF@.037	SF	3.78	1.25	5.03
1" x 4", tongue and groove	BF@.037	SF	3.07	1.25	4.32
Deduct for D Grade	—	SF	.74	—	-.74
Add for B Grade and better	—	SF	.90	—	.90
Add for specific lengths	—	SF	.18	—	.18
Add for diagonal patterns	BF@.004	SF	—	.14	.14
Unfinished select kiln dried heart pine flooring, 97% dense heartwood, random lengths, including 5% waste. 1" to 1-1/4" thick.					
4" wide	BF@.042	SF	9.21	1.42	10.63
5" wide	BF@.042	SF	9.48	1.42	10.90
6" wide	BF@.042	SF	9.59	1.42	11.01
8" wide	BF@.046	SF	10.30	1.55	11.85
10" wide	BF@.046	SF	11.90	1.55	13.45
Add for diagonal patterns	BF@.004	SF	—	.14	.14
Unfinished plank flooring, 3/4" thick, 3" to 8" widths, 2' to 12' lengths.					
Antique white pine	BF@.100	SF	9.84	3.38	13.22
Antique yellow pine	BF@.100	SF	9.09	3.38	12.47
Milled heart pine	BF@.100	SF	10.70	3.38	14.08
Distressed oak	BF@.100	SF	11.70	3.38	15.08
Milled oak	BF@.100	SF	10.60	3.38	13.98
Distressed American chestnut	BF@.100	SF	10.80	3.38	14.18
Milled American chestnut	BF@.100	SF	11.70	3.38	15.08
Aged hemlock/fir	BF@.100	SF	10.80	3.38	14.18
Antique poplar	BF@.100	SF	4.96	3.38	8.34
Aged cypress	BF@.100	SF	5.90	3.38	9.28
Add for 9" to 15" widths	—	%	15.0	—	—
Add for sanding and finishing.					
Sanding, 3 passes (60/80/100 grit)	BF@.023	SF	.08	.78	.86
2 coats of stain/sealer	BF@.010	SF	.12	.34	.46
2 coats of urethane	BF@.012	SF	.15	.41	.56
2 coats of lacquer	BF@.024	SF	.20	.81	1.01

Flooring, Wood Strip, Prefinished**Prefinished strip flooring**

Tongue and groove, 25/32" thick, 2-1/4" wide. Includes typical cutting waste. Installed over a prepared subfloor

Honey wheat oak, case covers 18.1 SF	BF@.062	SF	3.34	2.09	5.43
Marsh oak, case covers 20 SF	BF@.062	SF	3.99	2.09	6.08
Gunstock oak, case covers 20 SF	BF@.062	SF	3.99	2.09	6.08
Autumn wheat hickory, case covers 22 SF	BF@.062	SF	5.39	2.09	7.48
Natural hickory, case covers 22 SF	BF@.062	SF	5.52	2.09	7.61
Tawny oak, case covers 18.25 SF	BF@.062	SF	5.82	2.09	7.91
Fawn oak, case covers 24 SF	BF@.062	SF	6.79	2.09	8.88
Prefinished oak strip flooring trim					
7' 10" quarter round	BF@.320	Ea	12.40	10.80	23.20
6' 6" reducer	BF@.531	Ea	32.40	17.90	50.30
6' 6" stair nose	BF@.531	Ea	37.60	17.90	55.50
6' 6" T-molding	BF@.531	Ea	39.90	17.90	57.80

Floating hardwood flooring Tongue and groove. Install over concrete or other subfloor using an underfloor membrane. Edges and ends glued. Based on 3/8" gap at walls covered with 1/2" base or quarter round molding. The labor estimates below include laying the membrane, hardwood flooring and gluing.

Poly foam membrane, 100 SF roll	—	SF	.26	—	.26
'Floor Muffler' poly foam, 100 SF roll	—	SF	.68	—	.68
Cork underlayment, 1/4", 200 SF roll	—	SF	.73	—	.73
Urethane adhesive, 150 SF per gallon	—	SF	.31	—	.31
1/2" tongue and groove hardwood flooring, various colors	FL@.051	SF	4.15	2.58	6.73

Laminate wood floor, Pergo Plastic laminate on pressed wood base, 7-7/8" x 47-1/4" x 3/8" (20 cm x 120 cm x 8 mm), loose lay with glued tongue and groove joints. Many wood finishes available. 20.67 SF (1.9 square meters) per pack. Includes 10% waste and joint glue (bottle covers 150 SF).

Pergo Presto, on floors					
Most finishes	BF@.051	SF	2.92	1.72	4.64
Glued on stairs (treads and risers)	BF@.115	SF	3.80	3.89	7.69
Add for FloorMuffler underlayment (100 SF per pack)	BF@.010	SF	.68	.34	1.02
Pergo sound block foam	BF@.002	SF	.41	.07	.48
Add for 8 mil poly vapor barrier (over concrete)	BF@.002	SF	.15	.07	.22
T mold strip (joins same level surface)	BF@.040	LF	5.19	1.35	6.54
Reducer strip (joins higher surface)	BF@.040	LF	3.95	1.35	5.30
End molding (joins lower surface)	BF@.040	LF	5.19	1.35	6.54
Wall base, 4" high	BF@.040	LF	2.63	1.35	3.98
Stair nosing	BF@.050	LF	5.71	1.69	7.40

Laminate wood floor, Dupont Plastic laminate on pressed wood base, 11-1/2" x 46-9/16" x .0462", foam back, tongue and groove joints. Pack covers 17 SF with 8% waste.

Dupont Real Touch Elite on floors					
Most finishes	BF@.051	SF	5.36	1.72	7.08
Glued on stairs (treads and risers)	BF@.115	SF	6.85	3.89	10.74
6 mil vapor barrier (over concrete)	BF@.002	SF	.15	.07	.22

Bamboo flooring

Laminated plank bamboo flooring, tongue and groove, 72" long panels. Treated and kiln dried. Installs over wood subfloor. Use 1/2" nail gun. Space fasteners 8" to 10" apart, with a minimum of two nails per board. Assorted shades and textures.

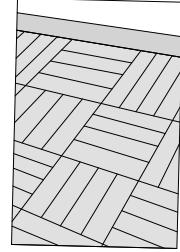
5/8" x 3-3/4" prefinished	BF@.062	SF	4.52	2.09	6.61
1/2" x 3" unfinished	BF@.062	SF	4.52	2.09	6.61
Laminated bamboo baseboard					
3" beveled edge prefinished	BC@.040	LF	4.42	1.48	5.90

Flooring, Wood, Parquet

	Craft@Hrs	Unit	Material	Labor	Total
Laminated prefinished bamboo stair nose 1/2" x 3-1/4"	BC@.040	LF	6.79	1.48	8.27
Laminated prefinished bamboo threshold 9/16" x 3-5/8" flat grain	BC@.174	LF	5.20	6.43	11.63
9/16" x 3-5/8" edge grain	BC@.174	LF	5.26	6.43	11.69
5/8" x 2"	BC@.174	LF	6.79	6.43	13.22
Add for sanding and finishing					
Sanding, 3 passes (60/80/100 grit)	BF@.023	SF	.08	.78	.86
2 coats of stain/sealer	BF@.010	SF	.12	.34	.46
2 coats of urethane	BF@.012	SF	.15	.41	.56
2 coats of lacquer	BF@.024	SF	.20	.81	1.01

Parquet block flooring Includes typical waste and coverage loss, installed over a prepared subfloor.

Unfinished parquet block flooring, 3/4" thick, 10" x 10" to 39" x 39" blocks, includes 5% waste. Cost varies by pattern with larger blocks costing more. These are material costs only. Add labor cost below.



Ash or quartered oak, select	—	SF	19.80	—	19.80
Ash or quartered oak, natural	—	SF	14.40	—	14.40
Cherry or walnut select grade	—	SF	22.60	—	22.60
Cherry or walnut natural grade	—	SF	17.00	—	17.00
Oak, select plain	—	SF	16.00	—	16.00
Oak, natural plain	—	SF	13.80	—	13.80

Prefinished parquet block flooring, 5/16" thick, select grade, specified sizes, includes 5% waste. Cost varies by pattern and size, with larger blocks costing more. These are material costs only. Add labor cost below.

Cherry or walnut 9" x 9"	—	SF	6.26	—	6.26
13" x 13"	—	SF	7.43	—	7.43
Oak 12" x 12" chestnut	—	SF	4.33	—	4.33
12" x 12" desert	—	SF	4.33	—	4.33
Teak 12" x 12"	—	SF	5.61	—	5.61
Prefinished natural hardwood, commodity grade 12" x 12"	—	SF	3.62	—	3.62

Labor and mastic for installing parquet block flooring

Parquet laid in mastic	BF@.055	SF	.30	1.86	2.16
Edge-glued over high density foam	BF@.052	SF	.50	1.76	2.26
Custom or irregular-shaped tiles, with adhesive	BF@.074	SF	.50	2.50	3.00
Add for installations under 1,000 SF	BF@.025	SF	.05	.84	.89
Add for sanding and finishing for unfinished parquet block flooring					
Sanding, 3 passes (60/80/100 grit)	BF@.023	SF	.06	.78	.84
2 coats of stain/sealer	BF@.010	SF	.11	.34	.45
2 coats of urethane	BF@.012	SF	.15	.41	.56
2 coats of lacquer	BF@.024	SF	.20	.81	1.01

Prefinished cross-band 3-ply birch parquet flooring, 6" to 12" wide by 12" to 48" blocks, Oregon Lumber.

Costs include cutting, fitting and 5% waste, but no subfloor preparation.

"Saima", 9/16" thick, typical price	BF@.050	SF	4.92	1.69	6.61
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Bonded blocks, 12" x 12", 1/8" thick, laid in mastic

Vinyl bonded cork	BF@.050	SF	4.03	1.69	5.72
Vinyl bonded domestic woods	BF@.062	SF	8.05	2.09	10.14
Vinyl bonded exotic woods	BF@.062	SF	16.30	2.09	18.39

Foundation Bolts

	Craft@Hrs	Unit	Material	Labor	Total
Acrylic (Permagrain) impregnated wood flooring. 12" x 12" x 5/16" thick block laid in mastic					
Oak block	BF@.057	SF	11.00	1.93	12.93
Ash block	BF@.057	SF	11.70	1.93	13.63
Cherry block	BF@.057	SF	12.20	1.93	14.13
Maple block	BF@.057	SF	12.30	1.93	14.23
Acrylic (Permagrain) impregnated 2-7/8" x random length plank laid in mastic					
Oak plank	BF@.057	SF	9.06	1.93	10.99
Maple plank	BF@.057	SF	12.10	1.93	14.03
Tupelo plank	BF@.057	SF	11.20	1.93	13.13
Lindenwood plank	BF@.057	SF	12.40	1.93	14.33
Cherry plank	BF@.057	SF	12.20	1.93	14.13
Wood flooring adhesive. For laminated wood plank and wood parquet flooring. Covers 150 square feet per gallon when applied with a 1/8" x 1/8" x 1/8" square-notch trowel for parquet or a 1/4" x 1/4" x 1/4" V-notch trowel for laminated plank.					
Quart	—	Ea	11.50	—	11.50
4 gallons	—	Ea	177.00	—	177.00

Foundation Bolts Galvanized, with nut and washer attached. Costs per bolt or bag.

1/2" x 6", pack of 1	B1@.107	Ea	1.69	3.58	5.27
1/2" x 6", pack of 25	B1@5.35	Ea	28.00	179.00	207.00
1/2" x 8", pack of 1	B1@.107	Ea	2.00	3.58	5.58
1/2" x 8", pack of 25	B1@5.35	Ea	35.10	179.00	214.10
1/2" x 10", pack of 1	B1@.107	Ea	2.31	3.58	5.89
1/2" x 10", pack of 25	B1@5.35	Ea	41.30	179.00	220.30
1/2" x 12", pack of 1	B1@.107	Ea	2.84	3.58	6.42
1/2" x 12", pack of 25	B1@5.35	Ea	50.40	179.00	229.40
1/2" x 18", pack of 1	B1@.107	Ea	4.00	3.58	7.58
1/2" x 18", pack of 25	B1@5.35	Ea	71.50	179.00	250.50
5/8" x 8", pack of 1	B1@.107	Ea	3.93	3.58	7.51
5/8" x 8", pack of 10	B1@2.68	Ea	30.40	89.60	120.00
5/8" x 10", pack of 1	B1@.107	Ea	4.40	3.58	7.98
5/8" x 10", pack of 10	B1@2.68	Ea	32.90	89.60	122.50

Framing Connectors All bolted connectors include nuts, bolts, and washers as needed. Costs are based on bulk purchases. Add 20% for smaller quantities.

Equivalent Simpson Strong-Tie Co. model numbers are shown in parentheses.

Angle clips (A34 and A35), 18 gauge, galvanized, no nails included

3" x 5" connector (A35 or A35F)	BC@.030	Ea	.48	1.11	1.59
3" x 4" connector (A34)	BC@.030	Ea	.43	1.11	1.54

Angle clips ("L") for general utility use, 16 gauge, galvanized, no nails included

3" (L30)	BC@.027	Ea	.98	1.00	1.98
5" (L50)	BC@.027	Ea	1.77	1.00	2.77
7" (L70)	BC@.027	Ea	1.78	1.00	2.78
9" (L90)	BC@.027	Ea	2.20	1.00	3.20

Brick wall ties (BTR), 22 gauge, per 1,000

7/8" x 6", corrugated	—	M	160.00	—	160.00
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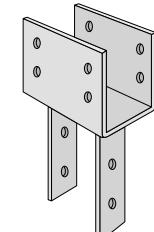
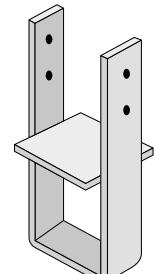
Bridging. See also Carpentry.

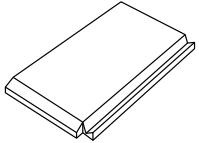
Cross or Tension bridging for solid sawn lumber (NCA & TB), steel, per pair, no nails required

12" joist spacing on center					
2" x 8" joists (NCA2X8-12)	BC@.022	Pr	1.39	.81	2.20
2" x 10" joists (NCA2X10-12)	BC@.022	Pr	.99	.81	1.80
2" x 12" joists (NCA2X12-12)	BC@.022	Pr	.99	.81	1.80
2" x 14" joists (NCA2X8-16)	BC@.022	Pr	1.10	.81	1.91
2" x 16" joists (NCA2X10-16)	BC@.022	Pr	1.05	.81	1.86

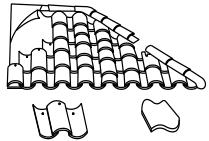
Framing Connectors

	Craft@Hrs	Unit	Material	Labor	Total
16" joist spacing on center					
2" x 8" joists (NCA2X8-16)	BC@.022	Pr	1.08	.81	1.89
2" x 10" joists (NCA2X10-16)	BC@.022	Pr	1.05	.81	1.86
2" x 12" joists (NCA2X12-16)	BC@.022	Pr	1.08	.81	1.89
2" x 14" to 2" x 16" joists (TB27)	BC@.022	Pr	1.98	.81	2.79
24" joist spacing on center					
2" x 10" to 2" x 16" joists (TB36)	BC@.022	Pr	2.70	.81	3.51
Cross or Tension bridging for I-Joists (TB), steel, per pair, no nails required					
12" joist spacing on center					
Joist heights 9-1/2" to 12" (TB20)	BC@.022	Pr	2.00	.81	2.81
Joist heights 14" to 18" (TB27)	BC@.022	Pr	1.98	.81	2.79
Joist heights 20" to 22" (TB30)	BC@.022	Pr	2.50	.81	3.31
Joist heights 24" to 30" (TB36)	BC@.022	Pr	2.58	.81	3.39
Joist height 32" (TB42)	BC@.022	Pr	4.78	.81	5.59
16" joist spacing on center					
Joist heights 9-1/2" to 16" (TB27)	BC@.022	Pr	1.98	.81	2.79
Joist heights 18" to 20" (TB30)	BC@.022	Pr	2.50	.81	3.31
Joist heights 22" to 28" (TB36)	BC@.022	Pr	2.58	.81	3.39
Joist heights 30" to 32" (TB42)	BC@.022	Pr	4.78	.81	5.59
24" joist spacing on center					
Joist heights 9-1/2" to 12" (TB30)	BC@.022	Pr	2.50	.81	3.31
Joist heights 14" to 22" (TB36)	BC@.022	Pr	2.58	.81	3.39
Joist heights 24" to 32" (TB42)	BC@.022	Pr	4.78	.81	5.59
Column bases, heavy duty (CB). Includes nuts and bolts. Labor shown is for placing column base before pouring concrete					
4" x 4" (CB44)	BC@.121	Ea	14.50	4.47	18.97
4" x 6" (CB46)	BC@.121	Ea	17.00	4.47	21.47
4" x 8" (CB48)	BC@.121	Ea	24.00	4.47	28.47
6" x 6" (CB66)	BC@.121	Ea	20.00	4.47	24.47
6" x 8" (CB68)	BC@.121	Ea	44.60	4.47	49.07
6" x 10" (CB610)	BC@.131	Ea	31.30	4.84	36.14
6" x 12" (CB612)	BC@.131	Ea	33.90	4.84	38.74
8" x 8" (CB88)	BC@.131	Ea	50.60	4.84	55.44
8" x 10" (CB810)	BC@.131	Ea	68.50	4.84	73.34
8" x 12" (CB812)	BC@.150	Ea	74.40	5.54	79.94
10" x 10" (CB1010)	BC@.150	Ea	88.90	5.54	94.44
10" x 12" (CB1012)	BC@.150	Ea	87.30	5.54	92.84
12" x 12" (CB1212)	BC@.150	Ea	113.00	5.54	118.54
Column caps or end column caps, heavy duty (CC) or (ECC). Includes nuts and bolts					
Column caps for solid lumber					
Beam size x post size					
4" x 4" (CC44)	BC@.260	Ea	40.40	9.60	50.00
4" x 6" (CC46)	BC@.300	Ea	65.80	11.10	76.90
6" x 4" (CC64)	BC@.300	Ea	92.10	11.10	103.20
6" x 6" (CC66)	BC@.400	Ea	72.00	14.80	86.80
6" x 8" (CC68)	BC@.600	Ea	92.10	22.20	114.30
8" x 6" (CC86)	BC@.600	Ea	102.00	22.20	124.20
8" x 8" (CC88)	BC@.750	Ea	102.00	27.70	129.70
10" x 6" (CC10X)	BC@.750	Ea	151.00	27.70	178.70
Column caps for glu-lam beams					
Beam size x post size					
3-1/4" x 4" (CC3-14-4)	BC@.260	Ea	78.70	9.60	88.30
3-1/4" x 6" (CC3-1/4-6)	BC@.300	Ea	76.70	11.10	87.80
5-1/4" x 6" (CC5-1/4-6)	BC@.400	Ea	98.30	14.80	113.10
5-1/4" x 8" (CC5-1/4-8)	BC@.600	Ea	95.80	22.20	118.00
7" x 6" (CC76)	BC@.600	Ea	96.00	22.20	118.20



Roofing, Tile

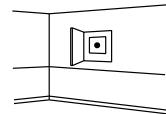
	Craft@Hrs	Unit	Material	Labor	Total
Fiber Cement Slate Roofing Eternit™, Stonit™, or Thrutone™, various colors. Non-asbestos formulation. Laid over 1/2" sheathing. Includes 30 lb. felt and one copper storm anchor per slate. Add for sheathing, flashing, hip, ridge and valley units.					
23-5/8" x 11-7/8", English (420 lb, 30 year)					
2" head lap (113 pieces per Sq)	R1@5.50	Sq	510.00	196.00	706.00
3" head lap (119 pieces per Sq)	R1@5.75	Sq	535.00	205.00	740.00
4" head lap (124 pieces per Sq)	R1@6.00	Sq	554.00	214.00	768.00
Add for hip and ridge units, in mastic	R1@0.10	LF	10.40	3.56	13.96
15-3/4" x 10-5/8", Continental (420 lb, 30 year)					
2" head lap (197 pieces per Sq)	R1@6.50	Sq	526.00	231.00	757.00
3" head lap (214 pieces per Sq)	R1@6.75	Sq	573.00	240.00	813.00
4" head lap (231 pieces per Sq)	R1@7.00	Sq	621.00	249.00	870.00
Add for hip and ridge units, in mastic	R1@0.10	LF	9.55	3.56	13.11
Copper storm anchors, box of 1,000 (\$44.00)	—	Ea	.04	—	.04
Stainless steel slate hooks	—	Ea	.42	—	.42
Add for extra felt under 5-in-12 pitch	R1@0.20	Sq	11.40	7.12	18.52
Roofing Tile, Clay Material costs include felt and flashing. No freight or waste included. Costs will be higher where clay tile is not manufactured locally. U.S. Tile Co.					
Spanish tile, "S"-shaped, 88 pieces per square, (800 lbs per square at 11" centers and 15" exposure)					
Natural red clay tile	R1@4.50	Sq	312.00	160.00	472.00
Add for coloring ("flashed")	—	Sq	14.50	—	14.50
Red hip and ridge units	R1@.047	LF	1.10	1.67	2.77
Color hip and ridge units	R1@.047	LF	1.56	1.67	3.23
Red rake units	R1@.047	LF	2.09	1.67	3.76
Color rake units	R1@.047	LF	2.30	1.67	3.97
Red clay mission tile 2-piece, 86 pans and 86 tops per square, 7-1/2" x 18" x 8-1/2" tiles at 11" centers and 15" exposure					
Natural red clay tile	R1@5.84	Sq	363.00	208.00	571.00
Add for coloring (costs vary widely)	—	Sq	55.20	—	55.20
Red hip and ridge units	R1@.047	LF	1.15	1.67	2.82
Color hip and ridge units	R1@.047	LF	1.56	1.67	3.23
Red rake units	R1@.047	LF	2.09	1.67	3.76
Color rake units	R1@.047	LF	2.30	1.67	3.97
Concrete Roof Tile Material includes felt, nails and flashing. Approximately 90 pieces per square. Monier Lifetile					
Shake, slurry color	R1@4.25	Sq	161.00	151.00	312.00
Slate, thru color	R1@4.25	Sq	196.00	151.00	347.00
Espana, slurry coated	R1@4.25	Sq	196.00	151.00	347.00
Monier 2000	R1@4.25	Sq	208.00	151.00	359.00
Vignette	R1@4.25	Sq	183.00	151.00	334.00
Collage	R1@4.25	Sq	183.00	151.00	334.00
Tapestry	R1@4.25	Sq	200.00	151.00	351.00
Split shake	R1@4.25	Sq	221.00	151.00	372.00
Villa, slurry coat	R1@4.25	Sq	182.00	151.00	333.00
Villa, Roma, thru color	R1@4.25	Sq	187.00	151.00	338.00
Trim tile					
Mansard "V"-ridge or rake, slurry coated	—	Ea	2.57	—	2.57
Mansard, ridge or rake, thru color	—	Ea	2.68	—	2.68
Hipstarters, slurry coated	—	Ea	22.10	—	22.10
Hipstarters, thru color	—	Ea	28.10	—	28.10



Safes

	Craft@Hrs	Unit	Material	Labor	Total
Accessories					
Eave closure or birdstop	R1@.030	LF	1.53	1.07	2.60
Hurricane or wind clips	R1@.030	Ea	.55	1.07	1.62
Underlayment or felt	R1@.050	Sq	11.40	1.78	13.18
Metal flashing and nails	R1@.306	Sq	11.50	10.90	22.40
Pre-formed plastic flashings					
Hip (13" long)	R1@.020	Ea	40.00	.71	40.71
Ridge (39" long)	R1@.030	Ea	41.00	1.07	42.07
Anti-ponding foam	R1@.030	LF	.35	1.07	1.42
Batten extenders	R1@.030	Ea	1.38	1.07	2.45
Roof loading					
Add to load tile and accessories on roof	R1@.822	Sq	—	29.30	29.30

Wall Safes, Residential UL approved combination lock, flush combination dial, 1/2" thick door. Fits between 16" on center studs. Installed during new construction.



For 2 x 4 wall thickness, outside dimensions 13.5" x 14" x 3.75"					
Capacity 400 cu. inches	BC@.788	Ea	599.00	29.10	628.10
For 2 x 6 wall thickness, outside dimensions 13.5" x 14" x 5.75"					
Capacity 750 cu. inches	BC@.788	Ea	627.00	29.10	656.10
For 2 x 12 wall thickness, outside dimensions 13.5" x 14" x 10.25"					
Capacity 1,350 cu. inches	BC@.950	Ea	663.00	35.10	698.10
For 2 x 12 wall thickness, outside dimensions 14" x 14" x 10.25"					
Capacity 1,550 cu. inches	BC@.950	Ea	863.00	35.10	898.10
Optional equipment					
Jewelry interior	—	Ea	75.00	—	75.00
Installation kit	—	Ea	20.00	—	20.00

Floor Safes, Residential 1/2" thick spring counter-balanced square door (13" x 13"), UL approved Group Two combination lock, metal cover plate – creates flush floor surface. Installed during new construction.

Outside dimensions 14.5" x 16" x 10.25"					
Capacity 1,100 cu. inches	BC@1.10	Ea	540.00	40.60	580.60
Outside dimensions 14.5" x 16" x 16.25"					
Capacity 2,325 cu. inches	BC@1.25	Ea	640.00	46.20	686.20
Outside dimensions 14.5" x 16" x 21.75"					
Capacity 3,545 cu. inches	BC@1.35	Ea	744.00	49.90	793.90
Outside dimensions 14.5" x 25" x 16.25"					
Capacity 3,970 cu. inches	BC@1.42	Ea	906.00	52.50	958.50
Outside dimensions 25" x 25" x 16.75"					
Capacity 7,050 cu. inches	BC@1.55	Ea	1,050.00	57.30	1,107.30
Outside dimensions 14.5" x 48" x 16.25"					
Capacity 7,775 cu. inches	BC@1.60	Ea	1,260.00	59.10	1,319.10
Upgrade to CB-Rating, 1" thick steel door, 1/4" body	—	%	15.0	—	—
Optional equipment					
Electronic push button lock	—	Ea	195.00	—	195.00
Dual key lock – in place of combination lock	—	Ea	35.00	—	35.00
Slotted doors (Deposit slot)	—	Ea	75.00	—	75.00
Combination change kit	—	Ea	10.00	—	10.00

Sandblasting

	Craft@Hrs	Unit	Material	Labor	Total
Man Safes, Residential					
Pry resistant door design, reinforced door jambs, 1" locking bolts, UL approved Group Two combination lock, basic drawer configuration. Installed during new construction.					
Outside dimensions 15" x 19" x 17"					
Capacity 2 cu. feet	BC@1.75	Ea	5,980.00	64.60	6,044.60
Outside dimensions 21" x 19" x 22"					
Capacity 4 cu. feet	BC@2.00	Ea	6,480.00	73.90	6,553.90
Outside dimensions 41" x 19" x 42"					
Capacity 7 cu. feet	BC@2.25	Ea	7,480.00	83.10	7,563.10

Sandblasting, Waterblasting, Subcontract The minimum charge for on-site (truck-mounted) sandblasting and waterblasting will usually be about \$500.00. Add the cost of extra liability insurance and physical barriers to protect adjacent swimming pools, residences, process plants, etc. No scaffolding included. Based on sandblasting with 375 CFM, 125 PSI compressor. Portable hydroblast and sandblast equipment for worksites beyond 30 miles from base will incur a \$50 transit time fee. Typical fuel surcharge is \$100 per 8-hour shift.

Sandblasting most surfaces					
Water soluble paints	—	SF	—	—	2.68
Oil paints	—	SF	—	—	3.06
Heavy mastic	—	SF	—	—	3.39
Sandblasting masonry					
Brick	—	SF	—	—	2.95
Block walls, most work	—	SF	—	—	2.95
Remove heavy surface grime	—	SF	—	—	3.55
Heavy, exposing aggregate	—	SF	—	—	3.88
Sandblasting concrete tilt-up panels					
Light blast	—	SF	—	—	3.12
Medium, exposing aggregate	—	SF	—	—	3.98
Heavy, exposing aggregate	—	SF	—	—	4.48
Sandblasting steel					
New, uncoated (commercial grade)	—	SF	—	—	3.49
New, uncoated (near white grade)	—	SF	—	—	4.34
Epoxy coated (near white grade)	—	SF	—	—	5.01
Sandblasting wood					
Medium blast, clean and texture	—	SF	—	—	3.30
Waterblast (hydroblast) with mild detergent					
To 5,000 PSI blast (4 hour minimum)	—	Hr	—	—	392.00
5,000 to 10,000 PSI blast (8 hour min.)	—	Hr	—	—	406.00
Over 10,000 PSI blast (8 hour minimum)	—	Hr	—	—	648.00
Wet sandblasting					
(4 hour minimum)	—	Hr	—	—	545.00

Sauna Rooms Costs listed are for labor and materials to install sauna rooms as described. Units are shipped as a disassembled kit complete with kiln dried softwood paneling boards, sauna heater, temperature and humidity controls and monitors, pre-assembled benches, prehung door, water bucket and dipper, and interior light. No electrical work included.

Western red cedar panel built sauna room package with heater, controls, duckboard floor and accessories. Glass front. Furniture grade interior. Ready for nailing to existing framed and insulated walls with exterior finish. Ceiling height 7'.

4' x 4' room	B1@6.68	Ea	5,990.00	223.00	6,213.00
4' x 6' room	B1@6.68	Ea	8,100.00	223.00	8,323.00
6' x 6' room	B1@8.00	Ea	8,670.00	268.00	8,938.00
6' x 8' room	B1@8.00	Ea	10,100.00	268.00	10,368.00
8' x 8' room	B1@10.7	Ea	13,400.00	358.00	13,758.00
8' x 10' room	B1@10.7	Ea	14,600.00	358.00	14,958.00
Add for electrical connection wiring	—	LS	—	—	335.00

Saunas

Craft@Hrs	Unit	Material	Labor	Total
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Custom-cut 100% vertical grain redwood or clear western red cedar sauna room package with heater, controls and accessories (including non-skid removable rubberized flooring). Ready for nailing to existing framed and insulated walls with exterior 7' ceiling height.

4' x 4' room	B1@8.00	Ea	4,580.00	268.00	4,848.00
4' x 6' room	B1@8.00	Ea	5,180.00	268.00	5,448.00
5' x 6' room	B1@8.00	Ea	5,470.00	268.00	5,738.00
6' x 6' room	B1@10.0	Ea	5,940.00	334.00	6,274.00
6' x 8' room	B1@12.0	Ea	6,830.00	401.00	7,231.00
8' x 8' room	B1@14.0	Ea	9,470.00	468.00	9,938.00
8' x 10' room	B1@15.0	Ea	10,200.00	502.00	10,702.00
10' x 10' room	B1@16.0	Ea	10,900.00	535.00	11,435.00
10' x 12' room	B1@16.0	Ea	11,800.00	535.00	12,335.00
Add for electrical connection wiring	—	LS	—	—	335.00

7-foot roll	10-foot roll	25-foot roll	100-foot roll
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Screen Wire Vinyl-coated fiberglass, noncombustible

Charcoal or gray, cost per roll

36" wide roll	8.98	—	15.20	53.00
48" wide roll	9.67	—	18.80	58.40
60" wide roll	—	14.00	23.00	105.00
72" wide roll	—	16.00	51.90	117.00
84" wide roll	—	17.00	29.50	130.00
96" wide roll	—	19.00	32.00	147.00

7-foot roll	25-foot roll	50-foot roll	100-foot roll
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Screen Wire, solar Blocks 90% of the sun's heat and glare. Protect interior surfaces from fading.

Black, cost per roll

36" wide roll	16.00	53.00	160.00	270.00
48" wide roll	21.00	64.00	184.00	359.00
60" wide roll	31.50	112.00	250.00	417.00
84" wide roll	—	—	350.00	562.00

Craft@Hrs	Unit	Material	Labor	Total
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Labor to install screen wire

Includes measure, lay out, cut and attach screen wire to an existing metal or wood frame.

Per linear foot of perimeter of frame	BC@.040	LF	—	1.48	1.48
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Security Alarms, Subcontract Costs are for securing building perimeter and all accessible openings with electronic alarm system, including all labor and materials. Costs assume that no interior wall, floor, or ceiling finishes are in place. All equipment is good to better quality.

Alarm control panel	—	Ea	—	—	544.00
Wiring, detectors per opening, with switch	—	Ea	—	—	94.30
Monthly monitoring charge	—	Mo	—	—	38.70
Alarm options (installed)	—	—	—	—	—
Audio detectors	—	Ea	—	—	136.00
Communicator (central station service)	—	Ea	—	—	303.00
Digital touch pad control	—	Ea	—	—	167.00
Entry/exit delay	—	Ea	—	—	118.00
Fire/smoke detectors	—	Ea	—	—	202.00
Interior/exterior sirens	—	Ea	—	—	90.20
Motion detector	—	Ea	—	—	274.00
Panic button	—	Ea	—	—	67.20
Passive infrared detector	—	Ea	—	—	377.00
Pressure mat	—	LF	—	—	109.00
Security light control	—	Ea	—	—	661.00

Add for wiring detectors and controls in existing buildings

With wall and ceiling finishes already in place	—	%	—	—	25.0
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Security Guards

	Craft@Hrs	Unit	Material	Labor	Total
Security Guards, Subcontract					
Construction site security guards, unarmed, in uniform with two-way radio, backup patrol car, bond, and liability insurance. Per manhour.					
Short term (1 night to 1 week)	—	Hr	—	—	44.00
Medium duration (1 week to 1 month)	—	Hr	—	—	42.80
Long term (1 to 6 months)	—	Hr	—	—	29.00
Add for licensed armed guard	—	Hr	—	—	6.60
Add for holidays	—	%	—	—	55.0
Construction site guard dog service for sites with totally enclosed perimeter, 24 hour per day, 7 day per week service. Local business codes may restrict or prohibit unattended guard dogs. Includes dog handling training session, liability insurance, on-site kennel. Cost per month.					
Contractor feeding and tending dog	—	Mo	—	—	750.00
Daily delivery of guard dog at quitting time and pickup at starting time by guard dog service (special hours require advance notice)					
Service feeding and tending dog	—	Mo	—	—	785.00
Construction site man and dog guard team, includes two-way radio communication with guard service office, backup patrol car, and liability insurance. Guard service may require that a telephone and guard shack be provided by the contractor. Cost for man and dog per hour.					
Short term (1 week to 1 month)	—	Hr	—	—	47.60
Long term (1 to 6 months)	—	Hr	—	—	34.10
Septic Sewer Systems, Subcontract					
Soils testing (percolation test) by qualified engineer (required by some communities when applying for septic system permit). Does not include application fee.					
Minimum cost	—	Ea	—	—	2,300.00
Residential septic sewer tanks. Costs include excavation for tank with good site conditions, placing of tank, inlet and outlet fittings, and backfill after hookup.					
Steel reinforced concrete tanks					
1,250 gallons (3 or 4 bedroom house)	—	Ea	—	—	2,510.00
1,500 gallons (5 or 6 bedroom house)	—	Ea	—	—	2,660.00
Fiberglass tanks					
1,000 gallons (3 bedroom house)	—	Ea	—	—	2,300.00
1,250 gallons (4 bedroom house)	—	Ea	—	—	2,350.00
1,500 gallons (5 or 6 bedroom house)	—	Ea	—	—	2,550.00
Polyethylene tanks					
500 gallons	—	Ea	—	—	726.00
750 gallons	—	Ea	—	—	1,200.00
1,000 gallons	—	Ea	—	—	1,310.00
1,250 gallons	—	Ea	—	—	2,100.00
1,500 gallons	—	Ea	—	—	2,340.00
Residential septic sewer drain fields (leach lines). Costs include labor, unsaturated paper, piping, gravel, excavation with good site conditions, backfill, and disposal of excess soil. 4" PVC pipe (ASTM D2729) laid in 3' deep by 1' wide trench.					
With 12" gravel base	—	LF	—	—	9.33
With 24" gravel base	—	LF	—	—	11.00
With 36" gravel base	—	LF	—	—	12.30
Add for pipe laid 6' deep	—	LF	—	—	3.17
Add for piping from house to septic tank, and from septic tank to remote drain fields					
4" PVC Schedule 40	—	LF	—	—	6.63
Basic pumping systems for residential waste , including fiberglass basin, pump, installation from septic tank or sewer line, 40' pipe run, and automatic float switch (no electric work or pipe included).					
To 15' head	—	LS	—	—	3,280.00
To 25' head	—	LS	—	—	3,880.00

Sewer, Pipes

	Craft@Hrs	Unit	Material	Labor	Total
To 30' head	—	LS	—	—	5,040.00
Add for high water or pump failure alarm	—	LS	—	—	717.00
Better quality pump system with two alternating pumps, 700 to 800 gallon concrete or fiberglass basin, automatic float switch, indoor control panel, high water or pump failure alarm, explosion proof electrical system but no electric work or pipe.	—	LS	—	—	9,550.00
Per pump system	—	LS	—	—	9,550.00

Pipe locating service to detect sewage and water leaks, breaks, and stoppages in pipes with diameter of 2" or more. Equipment can't be used where pipe has 90 degree turns. Maximum depth is 18" for cast iron and 30" for vitreous clay.

Residential 1/2 day rate	—	LS	—	—	480.00
Commercial 1/2 day rate	—	LS	—	—	641.00
Add for each additional pipe entered	—	LS	—	—	75.90
Plus per LF of pipe length	—	LF	—	—	2.77
Add for travel over 15 miles, per mile	—	Ea	—	—	1.03

Sewer Connections, Subcontract Including typical excavation and backfill.

4" vitrified clay pipeline, house to property line	—	LF	—	—	25.30
Long runs	—	LF	—	—	26.80
Short runs	—	LF	—	—	—
6" vitrified clay pipeline	—	LF	—	—	28.20
Long runs	—	LF	—	—	33.10
Short runs	—	LF	—	—	—
Street work	—	LF	—	—	67.30
4" PVC sewer pipe, city installed, property line to main line	—	LS	—	—	2,200.00
Up to 40 feet (connect in street)	—	LS	—	—	1,590.00
Up to 40 feet (connect in alley)	—	LS	—	—	—
Each foot over 40 feet	—	LF	—	—	49.50
6" PVC sewer pipe, city installed, property line to main line	—	LS	—	—	3,530.00
Up to 40 feet (connect in street)	—	LS	—	—	2,530.00
Up to 40 feet (connect in alley)	—	LS	—	—	—
Each foot over 40 feet	—	LF	—	—	78.90
8" PVC sewer pipe, city installed, property line to main line	—	LS	—	—	4,920.00
Up to 40 feet (connect in street)	—	LS	—	—	3,830.00
Up to 40 feet (connect in alley)	—	LS	—	—	—
Each foot over 40 feet	—	LF	—	—	102.00

Access Doors

Metal access doors, concealed metal hinge	SW@.363	Ea	22.30	15.10	37.40
8" x 8"	SW@.363	Ea	25.20	15.10	40.30
14" x 14"	SW@.363	Ea	41.70	15.10	56.80
24" x 24"	SW@.363	Ea	57.20	15.10	72.30
ABS access doors, paintable	SW@.363	Ea	9.83	15.10	24.93
6" x 9"	SW@.363	Ea	14.80	15.10	29.90
14" x 14"	SW@.363	Ea	59.10	15.10	74.20
24" x 18"	SW@.363	Ea	69.50	15.10	84.60
24" x 24"	SW@.363	Ea	19.10	—	19.10
24" x 18", screen only	—	Ea	21.90	—	21.90
Tub access doors	SW@.363	Ea	9.83	15.10	24.93
6" x 9", white ABS	SW@.363	Ea	14.60	15.10	29.70
14" x 14", white ABS	SW@.363	Ea	14.90	15.10	30.00
14" x 14", galvanized steel	SW@.363	Ea	—	—	—

Sheet Metal

	Craft@Hrs	Unit	Material	Labor	Total
Sheet Metal Area Walls Provides light well for basement windows, galvanized, corrugated.					
12" deep, 6" projection, 37" wide	SW@.410	Ea	33.90	17.10	51.00
18" deep, 6" projection, 37" wide	SW@.410	Ea	44.70	17.10	61.80
24" deep, 6" projection, 37" wide	SW@.410	Ea	58.30	17.10	75.40
30" deep, 6" projection, 37" wide	SW@.410	Ea	69.40	17.10	86.50
Add for steel grille cover	—	Ea	79.00	—	79.00

Sheet Metal Flashing

Aluminum flashing .0175" thickness is commercial grade. Mill finish except as noted.

Chimney flash kit (base, cricket & step flash)	SW@.900	Ea	37.00	37.40	74.40
Drip cap, 1-5/8" x 10' x .0175", white	SW@.350	Ea	6.07	14.60	20.67
Drip edge, 2-1/2" x 1" x .0145", 10' long	SW@.350	Ea	4.25	14.60	18.85
Drip edge, 6-1/2" x 1", 10' long	SW@.350	Ea	13.60	14.60	28.20
Flex corner, 2" x 2" x 3-1/2" radius	SW@.050	Ea	3.74	2.08	5.82
Gravel stop, 10' x 5-1/2", "C"-shape	SW@.350	Ea	6.11	14.60	20.71
Roll 6" x 10' x .011"	SW@.400	Ea	6.32	16.60	22.92
Roll 6" x 25' x .0175"	SW@.400	Ea	15.80	16.60	32.40
Roll 8" x 10' x .011"	SW@.400	Ea	7.91	16.60	24.51
Roll 8" x 25' x .0175"	SW@.400	Ea	20.10	16.60	36.70
Roll 10" x 10' x .011"	SW@.400	Ea	9.57	16.60	26.17
Roll 10" x 10' x .0175"	SW@.400	Ea	14.00	16.60	30.60
Roll 14" x 10' x .011"	SW@.400	Ea	12.00	16.60	28.60
Roll 14" x 25' x .0175"	SW@.400	Ea	34.70	16.60	51.30
Roll 20" x 10' x .011"	SW@.400	Ea	15.10	16.60	31.70
Roll 20" x 25' x .0175"	SW@.400	Ea	40.90	16.60	57.50
Roof edge, 2-1/2" x 1-1/2" x 10'	SW@.350	Ea	5.74	14.60	20.34
Roof edge, 4-1/2" x 1-1/2" x 10'	SW@.350	Ea	15.20	14.60	29.80
Sheet, 1' x 1', black	SW@.250	Ea	11.50	10.40	21.90
Sheet, 1' x 1', mill finish	SW@.250	Ea	8.79	10.40	19.19
Sheet, 1' x 2', black	SW@.250	Ea	20.30	10.40	30.70
Sheet, 1' x 2' x .020", lincaine perforated	SW@.250	Ea	21.50	10.40	31.90
Sheet, 2' x 3', mill finish	SW@.500	Ea	13.70	20.80	34.50
Sheet, 3' x 3', mill finish	SW@.500	Ea	22.80	20.80	43.60
Sheet, 3' x 3', lincaine perforated	SW@.500	Ea	37.70	20.80	58.50
Step flashing bent, 2-1/2" x 2-1/2" x 7"	SW@.040	Ea	.60	1.66	2.26
Step flashing, bent, 4" x 4" x 8"	SW@.040	Ea	.65	1.66	2.31
Step flashing, bent, 5" x 7", pack of 10	SW@.400	Ea	3.03	16.60	19.63
Trim coil 24" x 50', white and black	SW@2.50	Ea	105.00	104.00	209.00
Trim coil nails, box of 800	—	Ea	9.59	—	9.59

Copper flashing 16 ounce per square foot, .021 gauge, bright.

Roll 8" x 20'	SW@.750	Ea	40.90	31.20	72.10
Roll 12" x 20'	SW@.500	Ea	58.90	20.80	79.70
Roll 12" x 20', 3 ounce	SW@1.00	Ea	62.10	41.60	103.70
Roof edging, 1-1/2" x 2" x 10'	SW@.350	Ea	78.50	14.60	93.10
Roof edging, 2" x 2" x 10'	SW@.350	Ea	89.80	14.60	104.40
Roof-to-wall flashing, 4" x 6" x 10'	SW@.350	Ea	215.00	14.60	229.60
Shingle flashing, 8" x 12"	SW@.040	Ea	25.10	1.66	26.76
Step flashing, 5" x 7"	SW@.040	Ea	10.80	1.66	12.46
W-valley flashing, 18" x 10'	SW@.500	Ea	316.00	20.80	336.80
Copper nails, 1-1/4", box of 100	—	Box	23.70	—	23.70

Sheet Metal, Flashing

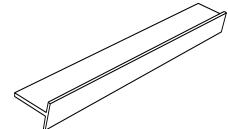
Craft@Hrs	Unit	Material	Labor	Total
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Plastic/poly-backed copper flashing 3 ounce per square foot. Compatible with ACQ-treated lumber.
Laminated to plastic/poly backing.

Roll 8" x 20'	SW@.500	Ea	29.60	20.80	50.40
Roll 10" x 20'	SW@.500	Ea	32.50	20.80	53.30
Roll 12" x 20'	SW@.500	Ea	49.30	20.80	70.10

Galvanized steel flashing Galvanized mill (plain) finish except as noted. 26 gauge. Galvanized steel flashing has a zinc coating which resists corrosion. Bonderized steel flashing adds a colored phosphate coating which improves paint adhesion.

ACQ-compatible flashing, 8" x 20'	SW@1.00	Ea	31.10	41.60	72.70
ACQ-compatible flashing, 10" x 20'	SW@1.00	Ea	43.30	41.60	84.90
Angle flashing, 3" x 5" x 10', 90-degree	SW@.500	Ea	8.63	20.80	29.43
Angle flashing, 4" x 4" x 10', 90-degree	SW@.500	Ea	7.33	20.80	28.13
Angle flashing, 6" x 6" x 10', 90-degree	SW@.500	Ea	10.50	20.80	31.30
Angle hem flashing, 4" x 3-1/2" x 10'	SW@.400	Ea	8.24	16.60	24.84
Chimney flash kit (base/cricket/step)	SW@.900	Ea	36.10	37.40	73.50
Counter flash, 1/2" x 6" x 10', bonderized	SW@.400	Ea	10.80	16.60	27.40
Deck ledger, 2" x 2" x 10', ACQ lumber	SW@.400	Ea	8.51	16.60	25.11
Deck ledger, 2" x 2" x 8', galvanized	SW@.350	Ea	6.29	14.60	20.89
Dormer flashing, 7", black	SW@.250	Ea	11.80	10.40	22.20
Dormer flashing, 7", mill finish	SW@.250	Ea	8.89	10.40	19.29
Drip cap, 1-1/2" x 10'	SW@.400	Ea	3.72	16.60	20.32
Drip edge, 2-1/2" x 1" x 10', white	SW@.400	Ea	4.92	16.60	21.52
Drip edge, 5" x 2" x 10', mill finish	SW@.400	Ea	7.02	16.60	23.62
Drip edge, 6" x 10', Beige,	SW@.400	Ea	9.61	16.60	26.21
Endwall flashing, 3" x 4" x 10'	SW@.400	Ea	10.70	16.60	27.30
Fascia cap, 2" x 10', bonderized	SW@.400	Ea	8.64	16.60	25.24
Fungus preventer, 2-1/2" x 50' zinc strip	SW@1.25	Ea	24.10	52.00	76.10
Girder shield flashing, 2" x 8" x 2" x 10'	SW@.400	Ea	11.60	16.60	28.20
Gravel guard, 6" x 10', type "E"	SW@.400	Ea	6.32	16.60	22.92
Gravel stop, 2" x 4" x 10', bonderized	SW@.400	Ea	10.20	16.60	26.80
Gravel stop, 2" x 4" x 10', galvanized	SW@.400	Ea	8.77	16.60	25.37
Gutter apron, 2' x 3' x 10', galvanized	SW@.400	Ea	6.66	16.60	23.26
Gutter apron, 2" x 3" x 10', bonderized	SW@.400	Ea	7.57	16.60	24.17
Half round square dormer, 12" x 12"	BC@.871	Ea	51.10	32.20	83.30
L-flashing, 2" x 2" x 10', bonderized	SW@.400	Ea	6.92	16.60	23.52
L-flashing, 2" x 2" x 10', galvanized	SW@.400	Ea	6.00	16.60	22.60
L-flashing, 4" x 6" x 10', bonderized	SW@.400	Ea	22.60	16.60	39.20
L-flashing, 4" x 6" x 10', galvanized	SW@.400	Ea	12.40	16.60	29.00
Moss preventer, 2-2/3" x 50', zinc	SW@1.25	Ea	37.70	52.00	89.70
Parapet coping, 2" x 8" x 2" x 10'	SW@.500	Ea	15.40	20.80	36.20
Vent pipe flash cone, 1/2" pipe	SW@.250	Ea	5.83	10.40	16.23
Vent pipe flash cone, 1" pipe	SW@.250	Ea	8.33	10.40	18.73
Vent pipe flash cone, 3" pipe	SW@.311	Ea	9.34	12.90	22.24
Vent pipe flash cone, 4" pipe	SW@.311	Ea	10.70	12.90	23.60
Vent pipe flash cone, 5" pipe	SW@.311	Ea	13.40	12.90	26.30
Rain diverter, 7-1/2" x 10'	SW@.400	Ea	8.88	16.60	25.48
Reglet, 3/4" x 10', snap top, bonderized	SW@.500	Ea	13.70	20.80	34.50
Reglet, 3/4" x 10', snap top, mill finish	SW@.500	Ea	7.63	20.80	28.43
Roll 6" x 10', galvanized	SW@.500	Ea	7.06	20.80	27.86
Roll 7" x 10', galvanized	SW@.500	Ea	8.35	20.80	29.15
Roll 8" x 10', bonderized	SW@.500	Ea	14.20	20.80	35.00
Roll 8" x 50', galvanized	SW@2.50	Ea	25.00	104.00	129.00



Single Family Home Costs

Use the costs below to check your estimates and to verify bids submitted by subcontractors. These costs are based on a 1,600 square foot home (as described on page 307) built during the third quarter of 2017 at a cost of \$121.69 per square foot. Figures in the column "% of Total" are the same as those listed in the Residential Rule of Thumb Construction Costs on page 307. These are averages and will vary widely with the type and quality of construction.

Item	Total manpower required	% of Total	\$ Unit	\$ Material	\$ Labor	\$ Equipment	Total \$ per SF	Total \$ 1600 SF
Excavation	3 men 2 days	1.2%	SF	—	\$1.10	\$0.36	\$1.46	\$2,336
Foundation, slab, piers	3 men 4 days	3.7%	SF	\$1.80	2.25	0.45	4.50	7,200
Flatwork (drive and walk)	3 men 3 days	2.4%	SF	1.17	1.46	0.29	2.92	4,672
Brick hearth & veneer	2 men 1 day	0.7%	SF	0.34	0.43	0.08	0.85	1,360
Rough hardware		0.6%	SF	0.29	0.37	0.07	0.73	1,168
Finish hardware		0.2%	SF	0.14	0.10	—	0.24	384
Rough lumber		6.4%	SF	7.79	—	—	7.79	12,464
Finish lumber		0.5%	SF	0.61	—	—	0.61	976
Rough carpentry labor	2 men 20 days	8.9%	SF	—	10.83	—	10.83	17,328
Finish carpentry labor	1 man 7 days	1.7%	SF	—	2.07	—	2.07	3,312
Countertops	1 man 2 days	1.5%	SF	1.10	0.73	—	1.83	2,928
Cabinets	2 men 2 days	3.7%	SF	3.60	0.90	—	4.50	7,200
Insulation (R19 ceiling)	1 man 3 days	2.3%	SF	1.82	0.98	—	2.80	4,480
Roofing	4 men 3 days	5.5%	SF	4.01	2.68	—	6.69	10,704
Painting	2 men 3 days	3.6%	SF	1.53	2.85	—	4.38	7,008
Shower & tub enclosure	1 man 1 day	0.5%	SF	0.37	0.24	—	0.61	976
Prefabricated fireplace	1 man 1 day	0.9%	SF	0.83	0.22	0.05	1.10	1,760
Bath accessories	1 man 1 day	0.7%	SF	0.57	0.28	—	0.85	1,360
Built-in appliances	1 man 1 day	1.6%	SF	1.76	0.20	—	1.96	3,136
Heating and ducting	2 men 5 days	2.9%	SF	1.41	2.12	—	3.53	5,648
Plmbg & sewer connections	3 men 5 days	7.3%	SF	3.55	4.44	0.89	8.88	14,208
Doors	2 men 2 days	1.9%	SF	1.50	0.81	—	2.31	3,696
Garage door	1 man 1 day	0.4%	SF	0.37	0.12	—	0.49	784
Alum windows/slidg drs	1 man 2 days	1.2%	SF	0.88	0.58	—	1.46	2,336
Exterior stucco	3 men 3 days	6.4%	SF	5.06	2.34	0.39	7.79	12,464
Gypsum wallboard	2 men 6 days	4.7%	SF	2.56	3.15	—	5.71	9,136
Resilient flooring	1 man 1 day	2.0%	SF	1.14	1.29	—	2.43	3,888
Carpeting	2 men 1 day	2.4%	SF	2.34	0.58	—	2.92	4,672
Wiring (Romex)	1 man 10 days	3.2%	SF	1.56	2.33	—	3.89	6,224
Lighting fixtures		1.2%	SF	1.17	0.29	—	1.46	2,336
Subtotal, DIRECT JOB COSTS		80.2%		\$49.27	\$45.74	\$2.58	\$97.59	\$156,144
Amount above, as a percent of total direct costs				50.49%	46.87%	2.64%	100.00%	—

Indirect Costs	% of Total	\$ Unit	\$ Material	\$ Labor	\$ Equipment	Total \$ per SF	Total \$ 1600 SF
Insurance, payroll tax	4.8%	SF	\$5.84	—	—	\$5.84	\$9,344
Plans & specs	0.4%	SF	0.49	—	—	0.49	784
Permits & utilities	1.7%	SF	2.07	—	—	2.07	3,312
Final cleanup	0.4%	SF	—	0.49	—	0.49	784
Subtotal, INDIRECT JOB COSTS	7.3%		\$8.40	\$0.49	—	\$8.89	14,224
Overhead & profit	12.5%	SF	\$15.21	—	—	\$15.21	\$24,336

Total all costs, rounded (based on 1600 SF)	100.0%	SF	\$72.88	\$46.23	\$2.58	\$121.69	\$194,704
Amount above, as a percent of total direct costs =	59.89%		37.99%	2.12%	100.00%	—	

The "Manpower" column assumes work is done in phases. Elapsed time, from breaking ground to final cleanup, will be about 10 weeks, plus delays due to weather, shortages and schedule conflicts.

Construction Economics Division

Construction Cost Index for New Single Family Homes

Period	% of 1967 Cost	\$ per SF of Floor	Period	% of 1967 Cost	\$ per SF of Floor	Period	% of 1967 Cost	\$ per SF of Floor
2000			2006			2012		
1st quarter	516.8	72.30	1st quarter	641.63	89.77	1st quarter	762.28	106.66
2nd quarter	520.4	72.80	2nd quarter	641.73	89.79	2nd quarter	767.30	107.37
3rd quarter	524.2	73.33	3rd quarter	644.78	89.87	3rd quarter	770.24	107.82
4th quarter	525.7	73.55	4th quarter	655.91	91.77	4th quarter	773.50	108.23
2001			2007			2013		
1st quarter	527.4	73.78	1st quarter	656.08	91.80	1st quarter	778.13	108.87
2nd quarter	528.8	73.98	2nd quarter	653.57	91.45	2nd quarter	781.69	109.37
3rd quarter	530.3	74.19	3rd quarter	655.00	91.67	3rd quarter	785.74	109.94
4th quarter	533.1	74.58	4th quarter	658.00	92.07	4th quarter	788.05	110.26
2002			2008			2014		
1st quarter	530.11	74.16	1st quarter	665.00	93.04	1st quarter	792.90	110.94
2nd quarter	530.29	74.18	2nd quarter	677.06	94.73	2nd quarter	796.73	111.48
3rd quarter	532.80	74.52	3rd quarter	699.06	95.17	3rd quarter	805.49	112.70
4th quarter	535.31	74.89	4th quarter	720.45	100.80	4th quarter	813.67	113.85
2003			2009			2015		
1st quarter	539.22	75.45	1st quarter	707.78	99.03	1st quarter	814.22	113.92
2nd quarter	540.58	75.63	2nd quarter	704.72	98.60	2nd quarter	815.65	114.12
3rd quarter	541.11	75.71	3rd quarter	704.69	98.59	3rd quarter	820.60	114.82
4th quarter	554.32	77.56	4th quarter	704.85	98.62	4th quarter	823.08	115.16
2004			2010			2016		
1st quarter	557.54	78.01	1st quarter	712.93	99.75	1st quarter	833.78	116.66
2nd quarter	578.42	80.93	2nd quarter	726.72	101.68	2nd quarter	838.41	117.31
3rd quarter	587.05	82.10	3rd quarter	732.20	102.45	3rd quarter	837.71	117.98
4th quarter	611.14	85.51	4th quarter	735.44	102.90	4th quarter	840.98	118.44
2005			2011			2017		
1st quarter	608.70	85.17	1st quarter	744.17	104.12	1st quarter	848.72	119.53
2nd quarter	616.87	86.31	2nd quarter	751.04	104.94	2nd quarter	859.81	121.09
3rd quarter	621.21	87.18	3rd quarter	755.55	105.91	3rd quarter	863.94	121.69
4th quarter	631.35	88.34	4th quarter	757.83	106.66	4th quarter		

The figures under the column “\$ per SF of Floor” show construction costs for building a good quality home in a suburban area under competitive conditions in each calendar quarter since 2000. This home is described below under the section “Residential Rule of Thumb.” These costs include the builder’s overhead and profit and a 450 square foot garage but no basement. The cost of a finished basement per square foot will be approximately 30% of the square foot cost of living area. If the garage area is more than 450 square feet, use 50% of the living area cost to adjust for the larger or smaller garage. To find the total construction cost of the home, multiply the living area (excluding the garage) by the cost in the column “\$ per SF of Floor.”

Deduct for rural areas	5.0%
Add for 1,800 SF house (better quality)	4.0
Add for 2,000 SF house (better quality)	3.0
Deduct for over 2,400 SF house	3.0
Add for split level house	3.0
Add for 3-story house	10.0
Add for masonry construction	9.0

Construction costs are higher in some cities and lower in others. Square foot costs listed in the table above are national averages. To modify these costs to your job site, apply the appropriate area modification factor from pages 12 through 15 of this manual. But note that area modifications on pages 12 through 15 are based on recent construction and may not apply to work that was completed many years ago.

Residential Rule of Thumb

Construction Costs

The following figures are percentages of total construction cost for a standard quality single family residence: 1,600 square foot single story, 3-bedroom, 1½ bath home plus attached two car (450 SF) garage. Costs assume a conventional floor, stucco exterior, wallboard interior, shingle roof, single fireplace, forced air heat, PVC water supply and drain lines, range with double oven, disposer, dishwasher and 900 SF of concrete flatwork.

Item	Percent	Item	Percent	Item	Percent	Item	Percent
Excavation	1.2	Finish lumber	.5	Painting	3.6	Doors	1.9
Flatwork (drive & walk)	2.4	Rough carpentry labor	8.9	Shower & tub enclosure	.5	Garage door	.4
Foundation, slab, piers	3.7	Finish carpentry labor	1.7	Prefabricated fireplace	.9	Alum. windows, door	1.2
Brick hearth & veneer	.7	Countertops	1.5	Bath accessories	.7	Exterior stucco	6.4
Rough hardware	.6	Cabinets	3.7	Built-in appliances	1.6	Gypsum wallboard	4.7
Finish hardware	.2	Insulation (R19 ceiling)	2.3	Heating and ducting	2.9	Resilient flooring	2.0
Rough lumber	6.4	Roofing	5.5	Plumb. & sewer conn.	7.3	Carpeting	2.4
						Overhead & profit	12.5

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Industrial and Commercial Division Contents

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04 Masonry

Craft@Hrs	Unit	Material	Labor	Total
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Chemical-Resistant Brick or Tile, Subcontract (also known as acid-proof brick). Typical prices for chemical-resistant brick or tile meeting ASTM C-279, types I, II, and III requirements. Installed with 1/8" thick bed and mortar joints over a membrane of either elastomeric bonded to the floors or walls, sheet membrane with a special seam treatment, squeegee hot-applied asphalt, cold-applied adhesive troweled on, or special spray-applied material. The setting bed and joint materials can be either 100% carbon-filled furan or phenolic, sodium or potassium silicates, silica-filled epoxy, polyester, vinyl ester or other special mortars. Expansion joints are required in floor construction, particularly where construction joints exist in the concrete. Additional expansion joints may be required, depending on the service conditions to which the floor will be subjected. Brick or tile will be either 3-3/4" x 8" face, 1-1/8" thick (splits); 3-3/4" x 8" face, 2-1/4" thick (singles); or 4" x 8" face, 1-3/8" thick (pavers). Costs are based on a 2,000 SF job. For smaller projects, increase the cost 5% for each 500 SF or portion of 500 SF less than 2,000 SF. For scheduling purposes estimate that a crew of 4 can install 75 to 100 SF of membrane and brick in an 8-hour day. These costs assume that the membrane is laid on a suitable surface prepared by others and include the subcontractor's overhead and profit.

Typical installed costs for chemical-resistant brick or tile (acid-proof brick), installed

Less complex jobs	—	SF	—	—	34.50
More complex jobs	—	SF	—	—	41.80
Minimum job cost	—	LS	—	—	22,600.00

Craft@Hrs	Unit	Material	Labor	Equipment	Total
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Concrete Block Retaining Walls Includes mortar, regular block, U-block, inspection block (for walls six courses high or higher) grout, cavity caps and No. 5 reinforcing steel. Equipment is a trailer-mounted 15 CY per hour grout pump, locally rented. Add the cost of wall foundations from the section that follows. For more detailed coverage of concrete block retaining walls, see *National Concrete & Masonry Estimator*, <http://CraftsmanSiteLicense.com> Retaining wall with one lintel block course and grouted and reinforced vertical cells at 16" O.C.

3' - 4" high wall	M1@.504	LF	15.50	23.70	.32	39.52
4' - 0" high wall	M1@.576	LF	18.60	27.10	.37	46.07
4' - 8" high wall	M1@.648	LF	21.30	30.50	.43	52.23
5' - 4" high wall	M1@.720	LF	23.90	33.90	.48	58.28
6' - 0" high wall	M1@.793	LF	26.60	37.30	.54	64.44
6' - 8" high wall	M1@.864	LF	29.20	40.70	.59	70.49
7' - 4" high wall	M1@.936	LF	31.80	44.10	.64	76.54
8' - 0" high wall	M1@1.01	LF	34.50	47.50	.70	82.70

Retaining wall with one lintel block course and grouted and reinforced vertical cells at 32" O.C.

3' - 4" high wall	M1@.454	LF	13.10	21.40	.21	34.71
4' - 0" high wall	M1@.526	LF	15.50	24.80	.24	40.54
4' - 8" high wall	M1@.598	LF	17.70	28.10	.26	46.06
5' - 4" high wall	M1@.670	LF	19.80	31.50	.29	51.59
6' - 0" high wall	M1@.743	LF	22.00	35.00	.32	57.32
6' - 8" high wall	M1@.814	LF	24.20	38.30	.34	62.84
7' - 4" high wall	M1@.886	LF	26.30	41.70	.37	68.37
8' - 0" high wall	M1@.958	LF	28.50	45.10	.40	74.00

Retaining wall with one lintel block course and grouted and reinforced vertical cells at 48" O.C.

3' - 4" high wall	M1@.436	LF	12.30	20.50	.17	32.97
4' - 0" high wall	M1@.508	LF	14.50	23.90	.19	38.59
4' - 8" high wall	M1@.580	LF	16.50	27.30	.21	44.01
5' - 4" high wall	M1@.652	LF	18.40	30.70	.23	49.33
6' - 0" high wall	M1@.725	LF	20.50	34.10	.24	54.84
6' - 8" high wall	M1@.797	LF	22.50	37.50	.26	60.26
7' - 4" high wall	M1@.869	LF	24.40	40.90	.28	65.58
8' - 0" high wall	M1@.941	LF	26.50	44.30	.30	71.10

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Equipment	Total
Retaining wall with two lintel block courses and grouted and reinforced vertical cells at 16" O.C.						
3' - 4" high wall	M1@.546	LF	17.10	25.70	.36	43.16
4' - 0" high wall	M1@.617	LF	20.30	29.00	.42	49.72
4' - 8" high wall	M1@.689	LF	22.90	32.40	.47	55.77
5' - 4" high wall	M1@.761	LF	25.50	35.80	.52	61.82
6' - 0" high wall	M1@.833	LF	28.20	39.20	.58	67.98
6' - 8" high wall	M1@.906	LF	30.80	42.60	.63	74.03
7' - 4" high wall	M1@.978	LF	33.40	46.00	.69	80.09
8' - 0" high wall	M1@1.05	LF	36.10	49.40	.74	86.24
Retaining wall with two lintel block courses and grouted and reinforced vertical cells at 32" O.C.						
3' - 4" high wall	M1@.495	LF	15.10	23.30	.28	38.68
4' - 0" high wall	M1@.567	LF	17.50	26.70	.31	44.51
4' - 8" high wall	M1@.639	LF	19.70	30.10	.33	50.13
5' - 4" high wall	M1@.711	LF	21.80	33.50	.36	55.66
6' - 0" high wall	M1@.783	LF	24.00	36.90	.39	61.29
6' - 8" high wall	M1@.856	LF	26.20	40.30	.42	66.92
7' - 4" high wall	M1@.928	LF	28.30	43.70	.44	72.44
8' - 0" high wall	M1@1.00	LF	30.50	47.10	.47	78.07
Retaining wall with two lintel block courses and grouted and reinforced vertical cells at 48" O.C.						
3' - 4" high wall	M1@.478	LF	14.50	22.50	.25	37.25
4' - 0" high wall	M1@.550	LF	16.60	25.90	.27	42.77
4' - 8" high wall	M1@.621	LF	18.60	29.20	.29	48.09
5' - 4" high wall	M1@.693	LF	20.60	32.60	.31	53.51
6' - 0" high wall	M1@.766	LF	22.60	36.10	.33	59.03
6' - 8" high wall	M1@.839	LF	24.60	39.50	.34	64.44
7' - 4" high wall	M1@.910	LF	26.60	42.80	.36	69.76
8' - 0" high wall	M1@.982	LF	28.60	46.20	.38	75.18
Retaining wall with three lintel block courses and grouted and reinforced vertical cells at 16" O.C.						
3' - 4" high wall	M1@.587	LF	18.80	27.60	.41	46.81
4' - 0" high wall	M1@.660	LF	21.90	31.10	.46	53.46
4' - 8" high wall	M1@.732	LF	24.50	34.50	.51	59.51
5' - 4" high wall	M1@.804	LF	27.20	37.80	.57	65.57
6' - 0" high wall	M1@.876	LF	29.80	41.20	.62	71.62
6' - 8" high wall	M1@.948	LF	32.50	44.60	.68	77.78
7' - 4" high wall	M1@1.02	LF	35.10	48.00	.73	83.83
8' - 0" high wall	M1@1.09	LF	37.80	51.30	.79	89.89
Retaining wall with three lintel block courses and grouted and reinforced vertical cells at 32" O.C.						
3' - 4" high wall	M1@.537	LF	17.10	25.30	.35	42.75
4' - 0" high wall	M1@.610	LF	19.60	28.70	.38	48.68
4' - 8" high wall	M1@.682	LF	21.70	32.10	.41	54.21
5' - 4" high wall	M1@.754	LF	23.80	35.50	.43	59.73
6' - 0" high wall	M1@.826	LF	26.00	38.90	.46	65.36
6' - 8" high wall	M1@.898	LF	28.20	42.30	.49	70.99
7' - 4" high wall	M1@.971	LF	30.30	45.70	.51	76.51
8' - 0" high wall	M1@1.04	LF	32.50	49.00	.54	82.04
Retaining wall with three lintel block course and grouted and reinforced vertical cells at 48" O.C.						
3' - 4" high wall	M1@.520	LF	16.60	24.50	.33	41.43
4' - 0" high wall	M1@.593	LF	18.80	27.90	.35	47.05
4' - 8" high wall	M1@.664	LF	20.70	31.30	.37	52.37
5' - 4" high wall	M1@.736	LF	22.70	34.60	.39	57.69
6' - 0" high wall	M1@.808	LF	24.80	38.00	.41	63.21
6' - 8" high wall	M1@.880	LF	26.70	41.40	.42	68.52
7' - 4" high wall	M1@.953	LF	28.70	44.90	.44	74.04
8' - 0" high wall	M1@1.03	LF	30.70	48.50	.46	79.66

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Concrete Foundations for Retaining Walls Includes hand excavation in normal soil, backfilling, board or plywood forming as noted, grade 60 reinforcing steel and 3,000 P.S.I. concrete poured from the chute. Concrete waste when poured against earth is assumed to be 1" of concrete at the bottom of the footing and 2" along the walls. Concrete waste when poured against forms is assumed to be 1" at the bottom of the pad. When forms are used, estimate that excavation will be required 18" beyond the forms.					
36" wide x 12" deep foundation with 4 No. 5 bars, 2' deep					
Hand excavated, poured against earth					
Excavation	CL@.412	LF	—	16.70	16.70
Reinforcing steel	RB@.072	LF	2.76	4.64	7.40
Concrete	CL@.075	LF	15.40	3.05	18.45
Hand excavated, poured against forms					
Excavation	CL@.894	LF	—	36.30	36.30
Formwork	M2@.251	LF	1.72	11.20	12.92
Reinforcing steel	RB@.072	LF	2.76	4.64	7.40
Concrete	CL@.068	LF	14.60	2.76	17.36
36" wide x 12" deep with 4 No. 5 bars, 3' deep					
Hand excavated, poured against earth					
Excavation	CL@.635	LF	—	25.80	25.80
Reinforcing steel	RB@.072	LF	2.76	4.64	7.40
Concrete	CL@.075	LF	15.40	3.05	18.45
Hand excavated, poured against forms					
Excavation	CL@1.36	LF	—	55.30	55.30
Formwork	M2@.251	LF	1.72	11.20	12.92
Reinforcing steel	RB@.072	LF	2.76	4.64	7.40
Concrete	CL@.068	LF	14.60	2.76	17.36
36" wide x 12" deep with 6 No. 5 bars, 2' deep					
Hand excavated, poured against earth					
Excavation	CL@.412	LF	—	16.70	16.70
Reinforcing steel	RB@.108	LF	4.13	6.95	11.08
Concrete	CL@.075	LF	15.40	3.05	18.45
Hand excavated, poured against forms					
Excavation	CL@.894	LF	—	36.30	36.30
Formwork	M2@.251	LF	1.72	11.20	12.92
Reinforcing steel	RB@.108	LF	4.13	6.95	11.08
Concrete	CL@.068	LF	14.60	2.76	17.36
36" wide x 12" deep with 6 No. 5 bars, 3' deep					
Hand excavated, poured against earth					
Excavation	CL@.635	LF	—	25.80	25.80
Reinforcing steel	RB@.108	LF	4.13	6.95	11.08
Concrete	CL@.075	LF	15.40	3.05	18.45
Hand excavated, poured against forms					
Excavation	CL@1.36	LF	—	55.30	55.30
Formwork	M2@.251	LF	1.72	11.20	12.92
Reinforcing steel	RB@.108	LF	4.13	6.95	11.08
Concrete	CL@.068	LF	14.60	2.76	17.36
36" wide x 16" deep with 6 No. 5 bars, 2' deep, No. 4 transverse bars at 2' O.C.					
Hand excavated, poured against earth					
Excavation	CL@.400	LF	—	16.30	16.30
Reinforcing steel	RB@.108	LF	4.88	6.95	11.83
Concrete	CL@.096	LF	20.10	3.90	24.00

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Hand excavated, poured against forms					
Excavation	CL@.882	LF	—	35.90	35.90
Formwork	M2@.337	LF	1.92	15.00	16.92
Reinforcing steel	RB@.108	LF	4.88	6.95	11.83
Concrete	CL@.089	LF	19.00	3.62	22.62
36" wide x 16" deep with 6 No. 5 bars, 3' deep, No. 4 transverse bars at 2' O.C.					
Hand excavated, poured against earth					
Excavation	CL@.624	LF	—	25.40	25.40
Reinforcing steel	RB@.108	LF	4.88	6.95	11.83
Concrete	CL@.096	LF	20.10	3.90	24.00
Hand excavated, poured against forms					
Excavation	CL@1.35	LF	—	54.90	54.90
Formwork	M2@.337	LF	1.92	15.00	16.92
Reinforcing steel	RB@.108	LF	4.88	6.95	11.83
Concrete	CL@.089	LF	19.00	3.62	22.62

Concrete Block Wall Assemblies Typical costs for standard natural gray medium weight masonry block walls including blocks, mortar, typical reinforcing and normal waste. Foundations are not included. For more detailed coverage of concrete block masonry, see *National Concrete & Masonry Estimator*, <http://CraftsmanSiteLicense.com>

Walls constructed with 8" x 16" blocks laid in running bond

4" thick wall	M1@.090	SF	2.43	4.24	6.67
6" thick wall	M1@.100	SF	2.99	4.71	7.70
8" thick wall	M1@.120	SF	3.54	5.65	9.19
12" thick wall	M1@.150	SF	5.11	7.06	12.17

Grouting Concrete Block Wall Cores Typical costs for filling concrete block wall cores with pumped concrete and rodded. Costs shown are based on 2 cores per 16" block and include a 10% allowance for waste.

Using C476 grout, pumped

—	CY	137.00	—	137.00
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Material pumped in place and rodded, all cores filled.

4" thick wall, (4.98 SF per CF)	M1@.020	SF	1.02	.94	1.96
6" thick wall, (4.56 SF per CF)	M1@.022	SF	1.11	1.04	2.15
8" thick wall, (3.79 SF per CF)	M1@.024	SF	1.34	1.13	2.47
10" thick wall, (3.08 SF per CF)	M1@.031	SF	1.65	1.46	3.11
12" thick wall, (2.46 SF per CF)	M1@.040	SF	2.06	1.88	3.94

Add for grouting cores at 16" intervals, material pumped in place and rodded.

4" thick wall, (8.42 SF per CF)	M1@.011	SF	.60	.52	1.12
6" thick wall, (7.73 SF per CF)	M1@.012	SF	.66	.56	1.22
8" thick wall, (6.53 SF per CF)	M1@.014	SF	.78	.66	1.44
10" thick wall, (5.19 SF per CF)	M1@.019	SF	.98	.89	1.87
12" thick wall, (4.21 SF per CF)	M1@.023	SF	1.21	1.08	2.29

Add for grouting cores at 24" intervals, material pumped in place and rodded.

4" thick wall, (10.24 SF per CF)	M1@.008	SF	.50	.38	.88
6" thick wall, (9.02 SF per CF)	M1@.009	SF	.56	.42	.98
8" thick wall, (8.61 SF per CF)	M1@.011	SF	.59	.52	1.11
10" thick wall, (6.76 SF per CF)	M1@.014	SF	.75	.66	1.41
12" thick wall, (5.57 SF per CF)	M1@.017	SF	.91	.80	1.71

Add for grouting cores at 32" intervals, material pumped in place and rodded.

4" thick wall, (11.66 SF per CF)	M1@.007	SF	.44	.33	.77
6" thick wall, (10.24 SF per CF)	M1@.008	SF	.50	.38	.88
8" thick wall, (9.97 SF per CF)	M1@.010	SF	.51	.47	.98
10" thick wall, (8.06 SF per CF)	M1@.013	SF	.63	.61	1.24
12" thick wall, (6.65 SF per CF)	M1@.014	SF	.76	.66	1.42

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Add for grouting cores per vertical linear foot (VLF) of core, material pumped in place and rodded.					
4" thick wall, (8.86 VLF per CF)	M1@.011	VLF	.86	.52	1.38
6" thick wall, (8.11 VLF per CF)	M1@.017	VLF	.94	.80	1.74
8" thick wall, (6.73 VLF per CF)	M1@.024	VLF	1.13	1.13	2.26
10" thick wall, (5.47 VLF per CF)	M1@.026	VLF	1.39	1.22	2.61
12" thick wall, (4.37 VLF per CF)	M1@.028	VLF	1.74	1.32	3.06
Add for 2" thick caps, natural gray concrete					
4" thick wall	M1@.027	LF	.96	1.27	2.23
6" thick wall	M1@.038	LF	1.15	1.79	2.94
8" thick wall	M1@.046	LF	1.31	2.17	3.48
12" thick wall	M1@.065	LF	1.78	3.06	4.84
Add for detailed block, 3/8" score					
Single score, one side	—	SF	.59	—	.59
Single score, two sides	—	SF	1.29	—	1.29
Multi-scores, one side	—	SF	.59	—	.59
Multi-scores, two sides	—	SF	1.29	—	1.29
Add for color block, any of above					
Light colors	—	%	12.0	—	—
Medium colors	—	%	18.0	—	—
Dark colors	—	%	25.0	—	—
Add for other than running bond	—	%	—	20.0	—
Glazed Concrete Block Prices are per square foot of wall and include allowance for mortar and waste but no foundation or excavation. 8" high x 16" long, 3/8" joints, no reinforcing or grout included.					
Based on 1.05 blocks per square foot (SF).					
Glazed 1 side					
2" wide	M1@.102	SF	13.10	4.80	17.90
4" wide	M1@.107	SF	15.30	5.04	20.34
6" wide	M1@.111	SF	15.20	5.22	20.42
8" wide	M1@.118	SF	16.10	5.55	21.65
Glazed 2 sides					
4" wide	M1@.122	SF	23.10	5.74	28.84
6" wide	M1@.127	SF	24.40	5.98	30.38
8" wide	M1@.136	SF	24.70	6.40	31.10
Glazed cove base, glazed 1 side, 8" high					
4" length	M1@.127	LF	45.00	5.98	50.98
6" length	M1@.137	LF	34.00	6.45	40.45
8" length	M1@.147	LF	26.00	6.92	32.92
Decorative Concrete Block Prices are per square foot of wall and include allowance for mortar and waste but no foundation, reinforcing, grout or excavation. Regular weight units, 1.05 blocks per SF.					
Split-face hollow block, 8" high x 16" long, 3/8" joints					
4" wide	M1@.110	SF	1.83	5.18	7.01
6" wide	M1@.121	SF	1.93	5.70	7.63
8" wide	M1@.133	SF	2.22	6.26	8.48
10" wide	M1@.140	SF	3.17	6.59	9.76
12" wide	M1@.153	SF	3.12	7.20	10.32
Split-rib (combed) hollow block, 8" high x 16" long, 3/8" joints					
4" wide	M1@.107	SF	2.72	5.04	7.76
6" wide	M1@.115	SF	2.83	5.41	8.24
8" wide	M1@.121	SF	3.13	5.70	8.83
10" wide	M1@.130	SF	4.10	6.12	10.22
12" wide	M1@.146	SF	4.05	6.87	10.92

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Screen block, 3/8" joints					
6" x 6" x 4" wide	M1@.210	SF	3.65	9.88	13.53
8" x 8" x 4" wide (2.25 per SF)	M1@.140	SF	5.52	6.59	12.11
12" x 12" x 4" wide (1 per SF)	M1@.127	SF	2.80	5.98	8.78
8" x 16" x 8" wide (1.11 per SF)	M1@.115	SF	2.91	5.41	8.32
Acoustical slotted block, by rated Noise Reduction Coefficient (NRC)					
4" wide, with metal baffle, NRC, .45 to .55	M1@.121	SF	4.53	5.70	10.23
6" wide, with metal baffle, NRC, .45 to .55	M1@.130	SF	5.34	6.12	11.46
8" wide, with metal baffle, NRC, .45 to .55	M1@.121	SF	6.64	5.70	12.34
8" wide, with fiber filler, NRC, .65 to .75	M1@.143	SF	8.58	6.73	15.31
Concrete Block Bond Beams For door and window openings, no grout or reinforcing included.					
Cost per linear foot of bond beam block					
6" wide, 8" high, 16" long	M1@.068	LF	2.80	3.20	6.00
8" wide, 8" high, 16" long	M1@.072	LF	3.19	3.39	6.58
10" wide, 8" high, 16" long	M1@.079	LF	4.46	3.72	8.18
12" wide, 8" high, 16" long	M1@.089	LF	4.46	4.19	8.65
12" wide, 8" high double bond beam, 16" long	M1@.102	LF	4.47	4.80	9.27
8" wide, 16" high, 16" long	M1@.127	LF	7.42	5.98	13.40
Grout for bond beams, 3,000 PSI concrete, by block size and linear foot of beam, no block or reinforcing included, based on block cavity at 50% of block volume					
8" high x 4" wide, .10 CF per LF	M1@.005	LF	.46	.24	.70
8" high x 6" wide, .15 CF per LF	M1@.010	LF	.68	.47	1.15
8" high x 8" wide, .22 CF per LF	M1@.017	LF	.99	.80	1.79
8" high x 10" wide, .30 CF per LF	M1@.023	LF	1.36	1.08	2.44
8" high x 12" wide, .40 CF per LF	M1@.032	LF	1.79	1.51	3.30
16" high x 8" wide, .44 CF per LF	M1@.061	LF	1.98	2.87	4.85
16" high x 10" wide, .60 CF per LF	M1@.058	LF	2.71	2.73	5.44
16" high x 12" wide, .80 CF per LF	M1@.079	LF	3.61	3.72	7.33
Grout hollow metal door frame in a masonry wall					
Single door	M1@.668	Ea	11.20	31.40	42.60
Double door	M1@.851	Ea	14.80	40.10	54.90
Additional Costs for Concrete Block					
Sill blocks	M1@.087	LF	1.74	4.10	5.84
Cutting blocks	M1@.137	LF	—	6.45	6.45
Stack bond	—	%	5.0	10.0	—
Add for cut-up jobs	—	%	5.0	5.0	—
Add for institutional grade work	—	%	5.0	15.0	—
Add for colored block	—	%	15.0	—	—
Glass Block Clear 3-7/8" thick block installed in walls to 8' high. Costs shown include 1/4" mortar joints, caulking, wall ties and 6% waste. Heights over 8' to 10' require additional scaffolding and handling and may increase labor costs up to 40%. Mortar is 1 part portland cement, 1/2 part lime, and 4 parts sand, plus integral waterproofer. Costs for continuous panel reinforcing in horizontal joints are listed below.					
Flat glass block, under 1,000 SF job					
6" x 6", 4 per SF	M1@.323	SF	43.10	15.20	58.30
8" x 8", 2.25 per SF	M1@.245	SF	23.70	11.50	35.20
12" x 12", 1 per SF	M1@.202	SF	53.70	9.51	63.21
Deduct for jobs over 1,000 SF to 5,000 SF	—	%	-4.0	-4.0	—
Deduct for jobs over 5,000 SF	—	%	-10.0	-10.0	—
Deduct for Thinline interior glass block	—	%	-10.0	—	—
Add for thermal control fiberglass inserts	—	%	5.0	5.0	—

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Replacing 8" x 8" x 4" clear glass block, 10 unit minimum Per block replaced, add for mortar	M1@.851	Ea	10.00	40.10	50.10
Additional costs for glass block					
Fiberglass or polymeric expansion joints	—	LF	.42	—	.42
Reinforcing steel mesh	—	LF	.52	—	.52
Wall anchors, 2' long					
Used where blocks aren't set into a wall	—	Ea	2.07	—	2.07
Asphalt emulsion, 600 LF per gallon	—	Gal	14.50	—	14.50
Waterproof sealant, 180 LF per gallon	—	Gal	15.90	—	15.90
Cleaning block after installation, using sponge and water only					
Per SF cleaned	CL@.023	SF	—	.93	.93

Stone Work The delivered price of stone can be expected to vary widely. These costs include mortar, based on 1/2" joints, but no scaffolding. Figures in parentheses show typical quantities installed per 8-hour day by a crew of two.

Rough stone veneer, 4", placed over stud wall

Lava stone (79 SF)	M4@.202	SF	8.24	9.50	17.74
Rubble stone (40 SF)	M4@.400	SF	11.70	18.80	30.50
Most common veneer (60 SF)	M4@.267	SF	14.60	12.60	27.20

Cut stone

Thinset granite tile, 1/2" thick (120 SF)	M4@.133	SF	17.20	6.25	23.45
Granite, 7/8" thick, interior (70 SF)	M4@.229	SF	28.10	10.80	38.90
Granite, 1-1/4" thick, exterior (60 SF)	M4@.267	SF	20.90	12.60	33.50
Limestone, 2" thick (70 SF)	M4@.229	SF	26.00	10.80	36.80
Limestone, 3" thick (60 SF)	M4@.267	SF	31.60	12.60	44.20
Marble, 7/8" thick, interior (70 SF)	M4@.229	SF	33.10	10.80	43.90
Marble, 1-1/4" thick, interior (70 SF)	M4@.229	SF	40.80	10.80	51.60
Sandstone, 2" thick (70 SF)	M4@.229	SF	23.30	10.80	34.10
Sandstone, 3" thick (60 SF)	M4@.267	SF	30.20	12.60	42.80
Add for honed finish	—	SF	2.71	—	2.71
Add for polished finish	—	SF	4.75	—	4.75

Marble specialties, typical prices

Floors, 7/8" thick, exterior (70 SF)	M1@.229	SF	25.10	10.80	35.90
Thresholds, 1-1/4" thick (70 LF)	M1@.229	LF	13.40	10.80	24.20
Bases, 7/8" x 6" (51 LF)	M1@.314	LF	11.90	14.80	26.70
Columns, plain (15 CF)	M1@1.06	CF	140.00	49.90	189.90
Columns, fluted (13 CF)	M1@1.23	CF	193.00	57.90	250.90
Window stools, 5" x 1" (60 LF)	M1@.267	LF	14.60	12.60	27.20
Toilet partitions (1.5 Ea)	M1@10.6	Ea	772.00	499.00	1,271.00
Stair treads, 1-1/4" x 11" (50 LF)	M1@.320	LF	32.60	15.10	47.70
Limestone, rough cut large blocks (39 CF)	M1@.410	CF	40.30	19.30	59.60

Manufactured stone veneer, including mortar, Cultured Stone®

Prefitted types (160 SF)	M1@.100	SF	8.34	4.71	13.05
Brick veneer type (120 SF)	M1@.133	SF	6.92	6.26	13.18
Random cast type (120 SF)	M1@.133	SF	7.64	6.26	13.90

Quarry Tile Unglazed natural red tile set in a portland cement bed with mortar joints.

Quarry floor tile

4" x 4" x 1/2", 1/8" straight joints	M1@.112	SF	4.22	5.27	9.49
6" x 6" x 1/2", 1/4" straight joints	M1@.101	SF	3.96	4.75	8.71
6" x 6" x 3/4", 1/4" straight joints	M1@.105	SF	5.17	4.94	10.11
8" x 8" x 3/4", 3/8" straight joints	M1@.095	SF	4.89	4.47	9.36
8" x 8" x 1/2", 1/4" hexagon joints	M1@.112	SF	5.57	5.27	10.84

Quarry wall tile

4" x 4" x 1/2", 1/8" straight joints	M1@.125	SF	4.19	5.88	10.07
6" x 6" x 3/4", 1/4" straight joints	M1@.122	SF	5.17	5.74	10.91

04 Masonry

	Craft@Hrs	Unit	Material	Labor	Total
Quarry tile stair treads 6" x 6" x 3/4", 12" wide tread	M1@.122	LF	5.69	5.74	11.43
Quarry tile window sill 6" x 6" x 3/4" tile on 6" wide sill	M1@.078	LF	5.46	3.67	9.13
Quarry tile trim or cove base 5" x 6" x 1/2" straight top	M1@.083	LF	4.19	3.91	8.10
6" x 6" x 3/4" round top	M1@.087	LF	4.89	4.10	8.99
Deduct for tile set in epoxy bed without grout joints	—	SF	—	-1.91	-1.91
Add for tile set in epoxy bed with grout joints	—	SF	1.48	—	1.48
Pavers and Floor Tile					
Brick, excluding platform cost					
Plate, glazed	M1@.114	SF	3.27	5.37	8.64
Laid in sand	M1@.089	SF	2.50	4.19	6.69
Pavers, on concrete, grouted	M1@.107	SF	4.40	5.04	9.44
Add for special patterns	—	%	25.0	35.0	—
Slate	M1@.099	SF	3.85	4.66	8.51
Terrazzo tiles, 1/4" thick					
Standard	M1@.078	SF	6.21	3.67	9.88
Granite	M1@.085	SF	10.10	4.00	14.10
Brick steps	M1@.186	SF	3.92	8.76	12.68
Interlocking Paving Stones These costs include fine sand to fill joints and machine vibration, but no excavation.					
No vapor(or other) barriers					
Interlocking pavers, rectangular, 60mm thick, Orion	M1@.083	SF	2.65	3.91	6.56
Interlocking pavers, hexagonal, 80mm thick, Omni	M1@.085	SF	3.23	4.00	7.23
Interlocking pavers, multi-angle, 80mm thick, Venus	M1@.081	SF	2.87	3.81	6.68
Concrete masonry grid pavers (erosion control)	M1@.061	SF	5.18	2.87	8.05
Add for a 1" sand cushion	M1@.001	SF	.05	.05	.10
Add for a 2" sand cushion	M1@.002	SF	.11	.09	.20
Deduct for over 5,000 SF	—	%	-3.0	-7.0	—
Masonry Lintels and Coping					
Reinforced precast concrete lintels					
4" wide x 8" high, to 6'6" long	M1@.073	LF	9.61	3.44	13.05
6" wide x 8" high, to 6'6" long	M1@.078	LF	17.20	3.67	20.87
8" wide x 8" high, to 6'6" long	M1@.081	LF	17.80	3.81	21.61
10" wide x 8" high, to 6'6" long	M1@.091	LF	22.90	4.28	27.18
4" wide x 8" high, over 6'6" to 10' long	M1@.073	LF	18.00	3.44	21.44
6" wide x 8" high, over 6'6" to 10' long	M1@.077	LF	21.10	3.62	24.72
8" wide x 8" high, over 6'6" to 10' long	M1@.081	LF	22.10	3.81	25.91
10" wide x 8" high, over 6'6" to 10' long	M1@.091	LF	30.40	4.28	34.68
Precast concrete coping, 5" average thickness, 4' to 8' long					
10" wide, gray concrete	M1@.190	LF	16.10	8.94	25.04
12" wide, gray concrete	M1@.200	LF	18.00	9.41	27.41
12" wide, white concrete	M1@.226	LF	44.50	10.60	55.10
Parging (Pargeting), Waterproofing and Dampproofing					
Parging, 2 coats, 1/2" thick	M3@.070	SF	.28	3.46	3.74
Parging, 2 coats, waterproof, 3/4" thick	M3@.085	SF	.40	4.20	4.60
Dampproofing, asphalt primer at 1 gallon per 100 SF, Dampproof coat at 30 pounds per 100 SF	CL@.029	SF	.14	1.18	1.32

22 Plumbing

	Craft@Hrs	Unit	Material	Labor	Total
Add for galvanized 1-1/4" pipe	—	%	30.0	—	—
Add for galvanized 1-1/4" 150 lb. malleable fittings	—	%	20.0	—	—
Add for galvanized 1-1/4" 300 lb. malleable fittings	—	%	65.0	—	—
Add for galvanized 1-1/4" pipe assembly, Schedule 40	—	%	30.0	—	—
1-1/2" carbon steel (A53) threaded pipe and fittings					
Pipe, no fittings or supports included, 1-1/2", threaded					
Schedule 40 to 10' high	M5@.110	LF	3.37	5.62	8.99
Schedule 40 over 10' to 20'	M5@.130	LF	3.37	6.64	10.01
Schedule 80 to 10' high	M5@.120	LF	5.73	6.13	11.86
Schedule 80 over 10' to 20'	M5@.140	LF	5.73	7.15	12.88
Pipe assembly, Schedule 40, fittings, hangers and supports	M5@.230	LF	7.30	11.70	19.00
Add for seamless pipe (A106)	—	%	45.0	—	—
90-degree ell's, 1-1/2" threaded					
150 lb, malleable iron	M5@.300	Ea	5.85	15.30	21.15
300 lb, malleable iron	M5@.333	Ea	17.60	17.00	34.60
45-degree ell's, 1-1/2" threaded					
150 lb, malleable iron	M5@.390	Ea	7.10	19.90	27.00
300 lb, malleable iron	M5@.429	Ea	23.00	21.90	44.90
Tees, 1-1/2" threaded					
150 lb, malleable iron	M5@.390	Ea	8.52	19.90	28.42
300 lb, malleable iron	M5@.429	Ea	22.00	21.90	43.90
150 lb, reducing, malleable iron	M5@.360	Ea	16.10	18.40	34.50
300 lb, reducing, malleable iron	M5@.390	Ea	41.00	19.90	60.90
Caps, 1-1/2" threaded					
150 lb, malleable iron	M5@.230	Ea	3.79	11.70	15.49
300 lb, malleable iron	M5@.250	Ea	13.30	12.80	26.10
Couplings, 1-1/2" threaded					
150 lb, malleable iron	M5@.300	Ea	5.36	15.30	20.66
300 lb, malleable iron	M5@.330	Ea	13.30	16.90	30.20
Unions, 1-1/2"					
150 lb, malleable iron	M5@.360	Ea	15.20	18.40	33.60
300 lb, malleable iron	M5@.400	Ea	21.70	20.40	42.10
Flanges, forged steel, 1-1/2"					
150 lb, threaded flange	M5@.840	Ea	21.10	42.90	64.00
300 lb, threaded flange	M5@1.15	Ea	31.90	58.70	90.60
600 lb, threaded flange	M5@1.26	Ea	68.70	64.40	133.10
Add for galvanized 1-1/2" pipe	—	%	30.0	—	—
Add for galvanized 1-1/2" 150 lb. malleable fittings	—	%	20.0	—	—
Add for galvanized 1-1/2" 300 lb. malleable fittings	—	%	55.0	—	—
Add for galvanized 1-1/2" pipe assembly, Schedule 40	—	%	30.0	—	—
2" carbon steel (A53) threaded pipe and fittings					
Pipe, no fittings or supports included, 2", threaded					
Schedule 40 to 10' high	M5@.120	LF	3.83	6.13	9.96
Schedule 40 over 10' to 20'	M5@.140	LF	3.83	7.15	10.98
Schedule 80 to 10' high	M5@.130	LF	6.00	6.64	12.64
Schedule 80 over 10' to 20'	M5@.150	LF	6.00	7.66	13.66
Pipe assembly, Schedule 40, fittings, hangers and supports	M5@.250	LF	5.34	12.80	18.14
Add for seamless pipe (A106)	—	%	40.0	—	—

22 Plumbing

	Craft@Hrs	Unit	Material	Labor	Total
90-degree ells, 2"					
150 lb, malleable iron	M5@.380	Ea	9.42	19.40	28.82
300 lb, malleable iron	M5@.418	Ea	23.30	21.40	44.70
45-degree ells, 2"					
150 lb, malleable iron	M5@.380	Ea	10.10	19.40	29.50
300 lb, malleable iron	M5@.418	Ea	32.50	21.40	53.90
Tees, 2" threaded					
150 lb, malleable iron	M5@.490	Ea	13.60	25.00	38.60
300 lb, malleable iron	M5@.539	Ea	30.20	27.50	57.70
150 lb, reducing, malleable iron	M5@.460	Ea	14.00	23.50	37.50
300 lb, reducing, malleable iron	M5@.500	Ea	38.70	25.50	64.20
Caps, 2" threaded					
150 lb, malleable iron	M5@.290	Ea	5.26	14.80	20.06
300 lb, malleable iron	M5@.320	Ea	12.60	16.30	28.90
Couplings, 2" threaded					
150 lb, malleable iron	M5@.380	Ea	7.35	19.40	26.75
300 lb, malleable iron	M5@.418	Ea	17.40	21.40	38.80
Flanges, forged steel, 2"					
150 lb, threaded flange	M5@.290	Ea	21.70	14.80	36.50
300 lb, threaded flange	M5@.310	Ea	34.40	15.80	50.20
600 lb, threaded flange	M5@.320	Ea	88.50	16.30	104.80
Unions, 2"					
150 lb, malleable iron	M5@.450	Ea	7.77	23.00	30.77
300 lb, malleable iron	M5@.500	Ea	21.70	25.50	47.20
Add for galvanized 2" pipe, add	—	%	30.0	—	—
Add for galvanized 2" 50 lb. malleable fittings	—	%	20.0	—	—
Add for galvanized 2" 300 lb. malleable fittings	—	%	55.0	—	—
Add for galvanized 2" pipe assembly, Schedule 40	—	%	30.0	—	—
3" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 3", plain end					
Schedule 40 to 10' high	MI@.190	LF	5.92	10.40	16.32
Schedule 40 over 10' to 20' high	MI@.230	LF	5.92	12.50	18.42
Schedule 80 to 10' high	MI@.280	LF	12.70	15.30	28.00
Schedule 80 over 10' to 20' high	MI@.335	LF	12.70	18.30	31.00
Pipe assembly, Schedule 40, fittings, hangers and supports	MI@.380	LF	8.37	20.70	29.07
Add for seamless pipe (A106)	—	%	40.0	—	—
Add for galvanized pipe assembly, Schedule 40	—	%	30.0	—	—
Butt welded joints, 3" pipe					
Schedule 40 pipe	MI@.930	Ea	—	50.70	50.70
Schedule 80 pipe	MI@1.11	Ea	—	60.60	60.60
90-degree ells, 3"					
Schedule 40 carbon steel, butt weld, long turn	MI@1.33	Ea	13.70	72.60	86.30
Schedule 80 carbon steel, butt weld, long turn	MI@1.77	Ea	19.40	96.60	116.00
45-degree ells, 3"					
Schedule 40, carbon steel, butt weld	MI@1.33	Ea	10.60	72.60	83.20
Schedule 80, carbon steel, butt weld	MI@1.77	Ea	15.00	96.60	111.60
Tees, 3"					
Schedule 40, carbon steel, butt weld	MI@2.00	Ea	34.60	109.00	143.60
Schedule 80, carbon steel, butt weld	MI@2.66	Ea	69.70	145.00	214.70
Reducing, Schedule 40, carbon steel, butt weld	MI@1.89	Ea	45.00	103.00	148.00

22 Plumbing

	Craft@Hrs	Unit	Material	Labor	Total
Caps, 3"					
Schedule 40, carbon steel, butt weld	MI@.930	Ea	16.50	50.70	67.20
Schedule 80, carbon steel, butt weld	MI@1.11	Ea	11.70	60.60	72.30
Reducing couplings					
Schedule 40, carbon steel, butt weld	MI@1.20	Ea	19.30	65.50	84.80
Weld-o-lets, 3"					
Schedule 40, carbon steel	MI@2.00	Ea	59.20	109.00	168.20
Welded pipe flanges, forged steel, 3" butt weld					
150 lb, slip-on flange	MI@.730	Ea	26.00	39.80	65.80
300 lb, slip-on flange	MI@.980	Ea	35.60	53.50	89.10
600 lb, slip-on flange	MI@1.03	Ea	71.10	56.20	127.30
150 lb, weld neck flange	MI@.730	Ea	32.40	39.80	72.20
300 lb, weld neck flange	MI@.980	Ea	40.30	53.50	93.80
600 lb, weld neck flange	MI@1.03	Ea	68.70	56.20	124.90
150 lb, threaded flange	MI@.460	Ea	47.00	25.10	72.10
300 lb, threaded flange	MI@.500	Ea	57.30	27.30	84.60
600 lb, threaded flange	MI@.510	Ea	94.30	27.80	122.10
Flange bolt & gasket kits, 3"					
Full face, red rubber gasket, 150 lb	MI@.750	Ea	10.90	40.90	51.80
Full face, red rubber gasket, 300 lb	MI@1.00	Ea	10.90	54.60	65.50
4" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 4", plain end					
Schedule 40 to 10' high	MI@.260	LF	8.48	14.20	22.68
Schedule 40 over 10' to 20' high	MI@.360	LF	8.48	19.60	28.08
Schedule 80 to 10' high	MI@.340	LF	18.60	18.60	37.20
Schedule 80 over 10' to 20' high	MI@.400	LF	18.60	21.80	40.40
Pipe assembly, Schedule 40, fittings,					
hangers and supports	MI@.430	LF	11.70	23.50	35.20
Add for seamless pipe (A106)	—	%	35.0	—	—
Add for galvanized pipe assembly, Schedule 40	—	%	30.0	—	—
Butt welded joints, 4" pipe					
Schedule 40 pipe	MI@1.25	Ea	—	68.20	68.20
Schedule 80 pipe	MI@1.50	Ea	—	81.80	81.80
90-degree ell's, 4"					
Schedule 40 carbon steel, butt weld, long turn	MI@1.33	Ea	22.10	72.60	94.70
Schedule 80 carbon steel, butt weld, long turn	MI@2.37	Ea	47.00	129.00	176.00
45-degree ell's, 4"					
Schedule 40, carbon steel, butt weld	MI@1.33	Ea	16.10	72.60	88.70
Schedule 80, carbon steel, butt weld	MI@2.37	Ea	22.80	129.00	151.80
Tees, 4"					
Schedule 40, carbon steel, butt weld	MI@2.67	Ea	47.50	146.00	193.50
Schedule 80, carbon steel, butt weld	MI@3.55	Ea	74.00	194.00	268.00
Reducing, Schedule 40 carbon steel, butt weld	MI@2.44	Ea	48.70	133.00	181.70
Caps, 4"					
Schedule 40, carbon steel, butt weld	MI@1.25	Ea	21.60	68.20	89.80
Schedule 80, carbon steel, butt weld	MI@1.50	Ea	15.70	81.80	97.50
Reducing couplings, 4"					
Schedule 40, carbon steel, butt weld	MI@1.60	Ea	20.60	87.30	107.90
Weld-o-lets, 4"					
Schedule 40, carbon steel	MI@2.67	Ea	77.50	146.00	223.50

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	Craft@Hrs	Unit	Material	Labor	Total
Welded flanges, forged steel, 4"					
150 lb, slip-on flange	MI@.980	Ea	35.20	53.50	88.70
300 lb, slip-on flange	MI@1.30	Ea	56.80	70.90	127.70
600 lb, slip-on flange	MI@1.80	Ea	139.00	98.20	237.20
150 lb, weld neck flange	MI@.980	Ea	43.70	53.50	97.20
300 lb, weld neck flange	MI@1.30	Ea	62.80	70.90	133.70
600 lb, weld neck flange	MI@1.80	Ea	126.00	98.20	224.20
150 lb, threaded flange	MI@.600	Ea	50.50	32.70	83.20
300 lb, threaded flange	MI@.640	Ea	64.20	34.90	99.10
600 lb, threaded flange	MI@.650	Ea	161.00	35.50	196.50
Flange bolt & gasket kits, 4"					
Full face, red rubber gasket, 150 lb	MI@1.00	Ea	13.20	54.60	67.80
Full face, red rubber gasket, 300 lb	MI@1.20	Ea	19.40	65.50	84.90
6" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 6", plain end					
Schedule 40 to 10' high	M8@.420	LF	14.90	23.60	38.50
Schedule 40 over 10' to 20'	M8@.500	LF	14.90	28.20	43.10
Schedule 80 to 10' high	M8@.460	LF	28.20	25.90	54.10
Schedule 80 over 10' to 20'	M8@.550	LF	28.20	31.00	59.20
Pipe assembly, Schedule 40, fittings, hangers and supports	M8@.800	LF	19.00	45.00	64.00
Add for seamless pipe (A106)	—	%	40.0	—	—
Add for galvanized pipe assembly, Schedule 40	—	%	30.0	—	—
Butt welded joints, 6" pipe					
Schedule 40 pipe	M8@1.87	Ea	—	105.00	105.00
Schedule 80 pipe	M8@2.24	Ea	—	126.00	126.00
90-degree ell's, 6"					
Schedule 40 carbon steel, butt weld, long turn	M8@2.67	Ea	63.20	150.00	213.20
Schedule 80 carbon steel, butt weld, long turn	M8@3.55	Ea	90.30	200.00	290.30
45-degree ell's, 6"					
Schedule 40, carbon steel, butt weld	M8@2.67	Ea	41.40	150.00	191.40
Schedule 80, carbon steel, butt weld	M8@3.55	Ea	64.50	200.00	264.50
Tees, 6"					
Schedule 40, carbon steel, butt weld	M8@4.00	Ea	88.60	225.00	313.60
Schedule 80, carbon steel, butt weld	M8@5.32	Ea	120.00	300.00	420.00
Reducing, Schedule 40 carbon steel, butt weld	M8@3.78	Ea	111.00	213.00	324.00
Caps, 6"					
Schedule 40, carbon steel, butt weld	M8@1.87	Ea	25.50	105.00	130.50
Schedule 80, carbon steel, butt weld	M8@2.24	Ea	29.80	126.00	155.80
Reducing couplings, 6"					
Schedule 40, carbon steel, butt weld	M8@2.30	Ea	38.40	129.00	167.40
Weld-o-lets, 6"					
Schedule 40, carbon steel	M8@3.65	Ea	322.00	205.00	527.00
Welded flanges, forged steel, 6"					
150 lb, slip-on flange	M8@1.47	Ea	56.60	82.80	139.40
300 lb, slip-on flange	M8@1.95	Ea	107.00	110.00	217.00
150 lb, weld neck flange	M8@1.47	Ea	74.00	82.80	156.80
300 lb, weld neck flange	M8@1.95	Ea	114.00	110.00	224.00
Flange bolt & gasket kits, 6"					
Full face, red rubber gasket, 150 lb	M8@1.20	Ea	22.70	67.60	90.30
Full face, red rubber gasket, 300 lb	M8@1.65	Ea	36.40	92.90	129.30

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	Craft@Hrs	Unit	Material	Labor	Total
8" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 8" plain end					
Schedule 40 to 10' high	M8@.510	LF	22.00	28.70	50.70
Schedule 40 over 10' to 20'	M8@.600	LF	22.00	33.80	55.80
Schedule 80 to 10' high	M8@.560	LF	42.70	31.50	74.20
Schedule 80 over 10' to 20' high	M8@.670	LF	42.70	37.70	80.40
Add for seamless pipe (A106)	—	%	40.0	—	—
Butt welded joints, 8" pipe					
Schedule 40 pipe	M8@2.24	Ea	—	126.00	126.00
Schedule 80 pipe	M8@2.68	Ea	—	151.00	151.00
90-degree ell's, 8"					
Schedule 40 carbon steel, butt weld, long turn	M8@3.20	Ea	126.00	180.00	306.00
Schedule 80 carbon steel, butt weld, long turn	M8@4.26	Ea	144.00	240.00	384.00
45-degree ell's, 8"					
Schedule 40, carbon steel, butt weld	M8@3.20	Ea	85.20	180.00	265.20
Schedule 80, carbon steel, butt weld	M8@4.26	Ea	90.40	240.00	330.40
Tees, 8"					
Schedule 40, carbon steel, butt weld	M8@4.80	Ea	178.00	270.00	448.00
Schedule 80, carbon steel, butt weld	M8@6.38	Ea	210.00	359.00	569.00
Reducing, Schedule 40, carbon steel, butt weld	M8@4.40	Ea	238.00	248.00	486.00
Caps, 8"					
Schedule 40, carbon steel, butt weld	M8@2.24	Ea	39.60	126.00	165.60
Schedule 80, carbon steel, butt weld	M8@2.68	Ea	39.90	151.00	190.90
Reducing couplings, 8"					
Schedule 40, carbon steel, butt weld	M8@2.88	Ea	88.70	162.00	250.70
Weld-o-lets, 8"					
Schedule 40, carbon steel	M8@4.76	Ea	528.00	268.00	796.00
Welded flanges, forged steel, 8"					
150 lb, slip-on flange	M8@1.77	Ea	76.80	99.70	176.50
300 lb, slip-on flange	M8@2.35	Ea	146.00	132.00	278.00
150 lb, weld neck flange	M8@1.77	Ea	107.00	99.70	206.70
300 lb, weld neck flange	M8@2.35	Ea	156.00	132.00	288.00
Flange bolt & gasket kits, 8"					
Full face, red rubber gasket, 150 lb	M8@1.40	Ea	21.70	78.80	100.50
Full face, red rubber gasket, 300 lb	M8@1.85	Ea	34.00	104.00	138.00
10" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 10", plain end					
Schedule 40 to 20' high	M8@.720	LF	31.50	40.50	72.00
Schedule 80 to 20' high	M8@.830	LF	74.10	46.70	120.80
Add for seamless pipe (A106)	—	%	40.0	—	—
Butt welded joints, 10" pipe					
Schedule 40 pipe	M8@2.70	Ea	—	152.00	152.00
Schedule 80 pipe	M8@3.22	Ea	—	181.00	181.00
90-degree ell's, 10"					
Schedule 40 carbon steel, butt weld, long turn	M8@4.00	Ea	225.00	225.00	450.00
Schedule 80 carbon steel, butt weld, long turn	M8@5.75	Ea	263.00	324.00	587.00
45-degree ell's, 10"					
Schedule 40, carbon steel, butt weld	M8@4.00	Ea	131.00	225.00	356.00
Schedule 80, carbon steel, butt weld	M8@5.75	Ea	145.00	324.00	469.00

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	Craft@Hrs	Unit	Material	Labor	Total
Tees, 10"					
Schedule 40, carbon steel, butt weld	M8@6.00	Ea	402.00	338.00	740.00
Schedule 80, carbon steel, butt weld	M8@8.61	Ea	338.00	485.00	823.00
Reducing, Schedule 40, carbon steel, butt weld	M8@5.60	Ea	402.00	315.00	717.00
Caps, 10"					
Schedule 40, carbon steel, butt weld	M8@2.80	Ea	66.60	158.00	224.60
Schedule 80, carbon steel, butt weld	M8@3.62	Ea	59.10	204.00	263.10
Reducing couplings, 10"					
Schedule 40, carbon steel, butt weld	M8@3.60	Ea	78.80	203.00	281.80
Weld-o-lets, 10"					
Schedule 40, carbon steel	M8@6.35	Ea	724.00	358.00	1,082.00
Welded pipe flanges, forged steel, 10"					
150 lb, slip-on flange	M8@2.20	Ea	127.00	124.00	251.00
150 lb, weld neck flange	M8@2.20	Ea	174.00	124.00	298.00
300 lb, weld neck flange	M8@2.90	Ea	353.00	163.00	516.00
Flange bolt & gasket kits, 10"					
Full face, red rubber gasket, 150 lb	M8@1.80	Ea	42.90	101.00	143.90
Full face, red rubber gasket, 300 lb	M8@2.20	Ea	54.30	124.00	178.30
12" carbon steel pipe (A53) and welded fittings					
Pipe, no fittings or supports included, 12", plain end					
Schedule 40 to 20' high	M8@.910	LF	38.00	51.20	89.20
Schedule 80 to 20' high	M8@1.05	LF	85.20	59.10	144.30
Add for seamless pipe (A106)	—	%	40.0	—	—
Butt welded joints, 12" pipe					
Schedule 40 pipe	M8@3.25	Ea	—	183.00	183.00
Schedule 80 pipe	M8@3.88	Ea	—	218.00	218.00
90-degree ell's, 12"					
Schedule 40 carbon steel, butt weld, long turn	M8@4.80	Ea	334.00	270.00	604.00
Schedule 80 carbon steel, butt weld, long turn	M8@7.76	Ea	368.00	437.00	805.00
45-degree ell's, 12"					
Schedule 40, carbon steel, butt weld	M8@4.80	Ea	190.00	270.00	460.00
Schedule 80, carbon steel, butt weld	M8@7.76	Ea	218.00	437.00	655.00
Tees, 12"					
Schedule 40, carbon steel, butt weld	M8@7.20	Ea	462.00	405.00	867.00
Schedule 80, carbon steel, butt weld	M8@11.6	Ea	490.00	653.00	1,143.00
Reducing, Schedule 40, carbon steel, butt weld	M8@6.80	Ea	598.00	383.00	981.00
Caps, 12"					
Schedule 40, carbon steel, butt weld	M8@3.36	Ea	83.60	189.00	272.60
Schedule 80, carbon steel, butt weld	M8@4.88	Ea	78.40	275.00	353.40
Reducing couplings, 12"					
Schedule 40, carbon steel, butt weld	M8@4.30	Ea	231.00	242.00	473.00
Weld-o-lets, 12"					
Schedule 40, carbon steel	M8@8.48	Ea	887.00	477.00	1,364.00
Welded flanges, forged steel, 12"					
150 lb, slip-on flange	M8@2.64	Ea	257.00	149.00	406.00
300 lb, slip-on flange	M8@3.50	Ea	433.00	197.00	630.00
150 lb, weld neck flange	M8@2.64	Ea	329.00	149.00	478.00
300 lb, weld neck flange	M8@3.50	Ea	576.00	197.00	773.00

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	Craft@Hrs	Unit	Material	Labor	Total
Flange bolt & gasket kits, 12"					
Full face, red rubber gasket, 150 lb	M8@2.20	Ea	56.40	124.00	180.40
Full face, red rubber gasket, 300 lb	M8@2.60	Ea	72.90	146.00	218.90

Copper Pressure Pipe and Soldered Copper Fittings Note that copper pipe and fitting prices can change very quickly as the price of copper changes. No hangers included. See pipe hangers in the sections that follow. Labor cost assumes pipe is installed either horizontally or vertically in a building and up to 10' above floor level. Add 25% to the labor cost for heights over 10' above floor level. For more detailed coverage of copper pressure pipe, see *National Plumbing & HVAC Estimator*, <http://CraftsmanSiteLicense.com>

Type M hard copper pipe Used for water supply pressure piping above ground inside residential buildings. Smaller quantities purchased from building material retailers may cost more. Larger quantities purchased from specialty suppliers will cost less. Add the cost of soldered wrought copper fittings and supports in the sections that follow.

1/2" pipe	P6@.032	LF	1.20	1.65	2.85
3/4" pipe	P6@.035	LF	1.96	1.81	3.77
1" pipe	P6@.038	LF	3.32	1.96	5.28
1-1/4" pipe	P6@.042	LF	5.39	2.17	7.56
1-1/2" pipe	P6@.046	LF	6.34	2.37	8.71
2" pipe	P6@.053	LF	9.25	2.74	11.99
2-1/2" pipe	P6@.060	LF	14.10	3.10	17.20
3" pipe	P6@.066	LF	18.00	3.41	21.41
4" pipe	P6@.080	LF	31.20	4.13	35.33

Type L hard copper pipe is commonly used for water supply pressure piping in commercial buildings, either above or below ground. Larger quantities will cost less. Smaller quantities purchased from building material retailers will cost more. Add the cost of soldered wrought copper fittings and supports in the sections that follow.

1/2" pipe	P6@.032	LF	1.61	1.65	3.26
3/4" pipe	P6@.035	LF	2.55	1.81	4.36
1" pipe	P6@.038	LF	4.12	1.96	6.08
1-1/4" pipe	P6@.042	LF	4.99	2.17	7.16
1-1/2" pipe	P6@.046	LF	10.00	2.37	12.37
2" pipe	P6@.053	LF	10.99	2.74	13.73
2-1/2" pipe	P6@.060	LF	19.70	3.10	22.80
3" pipe	P6@.066	LF	26.70	3.41	30.11
4" pipe	P6@.080	LF	42.40	4.13	46.53

Type L soft copper tube Type L tube is commonly used for water supply pressure piping in commercial buildings, either above or below ground. Commercial quantities will cost less. Smaller quantities purchased from building material retailers will cost more. Add the cost of copper fittings and supports in the sections that follow.

1/4", 50' coil	P6@.020	LF	.99	1.03	2.02
3/8", per foot	P6@.020	LF	1.74	1.03	2.77
1/2", per foot	P6@.025	LF	3.47	1.29	4.76
1/2", 10' coil	P6@.025	LF	2.28	1.29	3.57
1/2", 20' coil	P6@.025	LF	2.21	1.29	3.50
1/2", 60' coil	P6@.025	LF	2.47	1.29	3.76
1/2", 100' coil	P6@.025	LF	2.87	1.29	4.16
5/8", 20' coil	P6@.030	LF	2.97	1.55	4.52
3/4", 60' coil	P6@.030	LF	4.30	1.55	5.85
3/4", 100' coil	P6@.030	LF	4.57	1.55	6.12
1", per foot	P6@.035	LF	5.81	1.81	7.62
1", 100' coil	P6@.035	LF	5.63	1.81	7.44
1-1/4", 60' coil	P6@.042	LF	8.04	2.17	10.21
1-1/2", 60' coil	P6@.046	LF	10.30	2.37	12.67

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Craft@Hrs	Unit	Material	Labor	Total
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Type K hard copper pipe Installed in an open trench to 5' deep. No excavation or backfill included. Type K is acceptable for applications above and below ground, inside and outside of buildings. Use corporation (compression) fittings rather than soldered joints in underground applications. Based on commercial quantity purchases. Smaller quantities will cost up to 35% more. Add the cost of fittings and hangers when required.

1/2" pipe	P6@.032	LF	2.41	1.65	4.06
3/4" pipe	P6@.035	LF	4.48	1.81	6.29

Type K soft copper tube Type K is acceptable for applications above and below ground, inside and outside of buildings. Use corporation (compression) fittings rather than soldered joints in underground applications. Commercial quantities will cost less. Smaller quantities purchased from building material retailers will cost more. Add the cost of copper fittings and supports in the sections that follow.

1/2", 60' coil	P6@.025	LF	3.23	1.29	4.52
3/4", 60' coil	P6@.030	LF	6.55	1.55	8.10
3/4", 100' coil	P6@.030	LF	6.66	1.55	8.21
1", 100' coil	P6@.035	LF	8.32	1.81	10.13

Copper pressure fittings Soldered wrought copper fittings. Solder is 95% tin and 5% antimony (lead free). Installed either horizontally or vertically in a building up to 10' above floor level.

1/2" copper pressure fittings

1/2" 90-degree ell	P6@.107	Ea	.42	5.52	5.94
1/2" 45-degree ell	P6@.107	Ea	1.30	5.52	6.82
1/2" tee	P6@.129	Ea	.79	6.66	7.45
1/2" x 1/2" x 3/8" reducing tee	P6@.121	Ea	7.19	6.25	13.44
1/2" cap	P6@.069	Ea	.35	3.56	3.91
1/2" coupling	P6@.107	Ea	.40	5.52	5.92
1/2" copper x male pipe thread adapter	P6@.086	Ea	1.41	4.44	5.85

3/4" copper pressure fittings

3/4" 90-degree ell	P6@.150	Ea	.89	7.74	8.63
3/4" 45-degree ell	P6@.150	Ea	2.39	7.74	10.13
3/4" tee	P6@.181	Ea	2.97	9.34	12.31
3/4" x 3/4" x 1/2" reducing tee	P6@.170	Ea	4.40	8.78	13.18
3/4" cap	P6@.096	Ea	1.27	4.96	6.23
3/4" coupling	P6@.150	Ea	.74	7.74	8.48
3/4" copper x male pipe thread adapter	P6@.105	Ea	5.46	5.42	10.88

1" copper pressure fittings

1" 90-degree ell	P6@.193	Ea	4.79	9.96	14.75
1" 45-degree ell	P6@.193	Ea	7.39	9.96	17.35
1" tee	P6@.233	Ea	11.60	12.00	23.60
1" x 1" x 3/4" reducing tee	P6@.219	Ea	11.80	11.30	23.10
1" cap	P6@.124	Ea	2.81	6.40	9.21
1" coupling	P6@.193	Ea	2.96	9.96	12.92
1" copper x male pipe thread adapter	P6@.134	Ea	8.27	6.92	15.19

1-1/4" copper pressure fittings

1-1/4" 90-degree ell	P6@.236	Ea	7.52	12.20	19.72
1-1/4" 45-degree ell	P6@.236	Ea	10.20	12.20	22.40
1-1/4" tee	P6@.285	Ea	16.40	14.70	31.10
1-1/4" x 1-1/4" x 1" reducing tee	P6@.268	Ea	8.20	13.80	22.00
1-1/4" cap	P6@.151	Ea	4.19	7.79	11.98
1-1/4" coupling	P6@.236	Ea	5.41	12.20	17.61
1-1/4" copper x male pipe thread adapter	P6@.163	Ea	11.90	8.41	20.31

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	Craft@Hrs	Unit	Material	Labor	Total
1-1/2" copper pressure fittings					
1-1/2" 90-degree ell	P6@.278	Ea	12.10	14.40	26.50
1-1/2" 45-degree ell	P6@.278	Ea	12.20	14.40	26.60
1-1/2" tee	P6@.337	Ea	23.80	17.40	41.20
1-1/2" x 1-1/2" x 1-1/4" reducing tee	P6@.302	Ea	12.10	15.60	27.70
1-1/2" cap	P6@.178	Ea	5.98	9.19	15.17
1-1/2" coupling	P6@.278	Ea	8.19	14.40	22.59
1-1/2" copper x male pipe thread adapter	P6@.194	Ea	14.90	10.00	24.90
2" copper pressure fittings					
2" 90-degree ell	P6@.371	Ea	19.30	19.20	38.50
2" 45-degree ell	P6@.371	Ea	18.90	19.20	38.10
2" tee	P6@.449	Ea	33.70	23.20	56.90
2" x 2" x 1-1/2" reducing tee	P6@.422	Ea	5.36	21.80	27.16
2" cap	P6@.238	Ea	10.80	12.30	23.10
2" coupling	P6@.371	Ea	13.50	19.20	32.70
2" copper x male pipe thread adapter	P6@.259	Ea	22.60	13.40	36.00
2-1/2" copper pressure fittings					
2-1/2" 90-degree ell	P6@.457	Ea	39.50	23.60	63.10
2-1/2" 45-degree ell	P6@.457	Ea	48.00	23.60	71.60
2-1/2" tee	P6@.552	Ea	76.40	28.50	104.90
2-1/2" x 2 1/2" x 2" reducing tee	P6@.519	Ea	90.00	26.80	116.80
2-1/2" cap	P6@.292	Ea	33.90	15.10	49.00
2-1/2" coupling	P6@.457	Ea	23.30	23.60	46.90
2-1/2" copper x male pipe thread adapter	P6@.319	Ea	71.60	16.50	88.10
3" copper pressure fittings					
3" 90-degree ell	P6@.543	Ea	46.70	28.00	74.70
3" 45-degree ell	P6@.543	Ea	62.40	28.00	90.40
3" tee	P6@.656	Ea	117.00	33.90	150.90
3" x 3" x 2" reducing tee	P6@.585	Ea	102.00	30.20	132.20
3" cap	P6@.347	Ea	41.10	17.90	59.00
3" coupling	P6@.543	Ea	35.60	28.00	63.60
3" copper x male pipe thread adapter	P6@.375	Ea	120.00	19.40	139.40
4" copper pressure fittings					
4" 90-degree ell	P6@.714	Ea	120.00	36.90	156.90
4" 45-degree ell	P6@.714	Ea	131.00	36.90	167.90
4" tee	P6@.863	Ea	255.00	44.50	299.50
4" x 4" x 3" reducing tee	P6@.811	Ea	192.00	41.90	233.90
4" cap	P6@.457	Ea	86.50	23.60	110.10
4" coupling	P6@.714	Ea	83.80	36.90	120.70
4" copper x male pipe thread adapter	P6@.485	Ea	256.00	25.00	281.00

Flexible PVC-Jacketed Copper Tubing For fuel oil, gas and propane transfer lines. Flame retardant and dielectric. Fungus, acid and moisture corrosion resistant. Acceptable for direct burial underground or under concrete. Installed in an open trench.

3/8" OD	PM@.010	LF	1.40	.43	1.83
1/2" OD	PM@.010	LF	1.68	.43	2.11
5/8" OD	PM@.010	LF	2.34	.43	2.77

Shrinkage kit for flexible PVC-jacketed copper tubing. Add for shrinkage tubing kit to allow for the coupling of sections with standard flare fittings while maintaining the integrity of the connection.

3/8" kit	—	Ea	13.20	—	13.20
1/2" kit	—	Ea	14.20	—	14.20
5/8" kit	—	Ea	16.30	—	16.30

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