

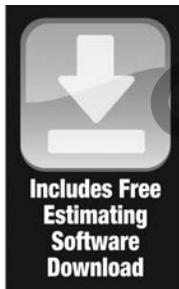
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2014 NATIONAL CONSTRUCTION ESTIMATOR

62nd Edition

Edited by Richard Pray



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This Book Is an Encyclopedia of 2014 Building Costs

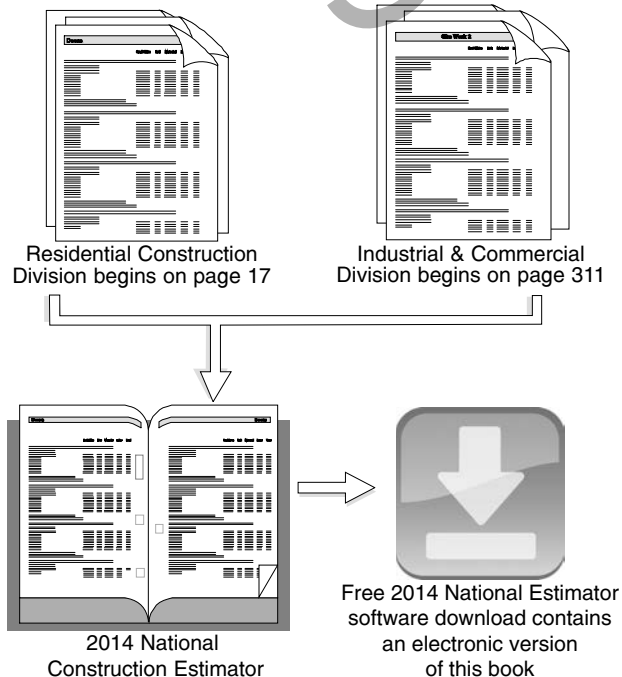
The **2014 National Construction Estimator** lists estimated construction costs to general contractors performing the work with their own crews, as of mid-2014. Overhead & profit are not included.

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 311 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 645.

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

When the National Estimator program has been installed, click Help on the menu bar to see a list of topics that will get you up and running. Or go online to www.costbook.com and click the ShowMe tutorial link to view an interactive tutorial for National Estimator.



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-2014. Discounts may be available for purchases in larger volume.

Quarterly prices updates on the Web are free and automatic all during 2014. 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 312 (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 186 and 288.

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 312 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 312 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 323 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 210 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 210 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 2013 and projected to mid-2014 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

AASHO	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 quality glass
CSPE	chloro sulphinated polyethylene	LP	liquified propane	STC	sound transmission class
CSF	100 square feet	LS	lump sum	Std	standard
CSY	100 square yards	M	one thousand	SY	square yard
CY	cubic yard	Mb	million bytes (characters)	T	thick
d	penny	MBF	1,000 board feet	T&G	tongue & groove edge
D	depth	MBtu	1,000 British thermal units	TV	television
DC	direct current	MCM	1,000 circular mils	UBC	Uniform Building Code
dia	diameter	MDO	medium density overlaid	UL	Underwriter's Laboratory
DSB	double strength B quality glass	MH	manhour	USDA	United States Dept. of Agriculture
DWV	drain, waste, vent piping	Mi	mile	VLF	vertical linear foot
Ea	each	MLF	1,000 linear feet	W	width
EMT	electric metallic tube	MPH	miles per hour	Wk	week
EPDM	ethylene propylene diene monomer	mm	millimeter(s)	W/	with
equip.	equipment	Mo	month	x	by or times
exp.	exposure	MSF	1,000 square feet	Symbols	
F	Fahrenheit	NEMA	National Electrical Manufacturer's Association	/	per
		NFPA	National Fire Protection Association	—	through or to
		No.	number	@	at
		NRC	noise reduction coefficient	%	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 ½" 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 ½" 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 \$32.59. That's the average for a residential laborer (listed at \$29.13 per hour on page 10) and a residential carpenter (listed at \$36.05 per hour): \$29.13 plus \$36.05 is \$65.18. Divide by 2 to get \$32.59, 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 ½" BC wall sheathing is \$0.52 per square foot. That's the installation time (.016 manhours per square foot) multiplied by \$32.59, 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	\$32.59	1 laborer and 1 carpenter	BR	\$34.89	1 lather
B2	\$33.74	1 laborer, 2 carpenters	BS	\$31.66	1 marble setter
B3	\$31.44	2 laborers, 1 carpenter	CF	\$34.02	1 cement mason
B4	\$35.64	1 laborer 1 operating engineer 1 reinforcing iron worker	CT	\$33.90	1 mosaic & terrazzo worker
B5	\$35.40	1 laborer, 1 carpenter 1 cement mason 1 operating engineer 1 reinforcing iron worker	D1	\$35.27	1 drywall installer 1 drywall taper
B6	\$31.58	1 laborer, 1 cement mason	DI	\$34.91	1 drywall installer
B7	\$29.51	1 laborer, 1 truck driver	DT	\$35.62	1 drywall taper
B8	\$35.03	1 laborer 1 operating engineer	HC	\$28.43	1 plasterer helper
B9	\$31.96	1 bricklayer 1 bricklayer's helper	OE	\$40.93	1 operating engineer
BB	\$36.59	1 bricklayer	P1	\$35.39	1 laborer, 1 plumber
BC	\$36.05	1 carpenter	PM	\$41.65	1 plumber
BE	\$39.04	1 electrician	PP	\$32.87	1 painter, 1 laborer
BF	\$32.51	1 floor layer	PR	\$36.42	1 plasterer
BG	\$34.77	1 glazier	PT	\$36.60	1 painter
BH	\$27.32	1 bricklayer's helper	R1	\$34.80	1 roofer, 1 laborer
BL	\$29.13	1 laborer	RI	\$36.86	1 reinforcing iron worker
			RR	\$40.46	1 roofer
			SW	\$40.50	1 sheet metal worker
			T1	\$31.55	1 tile layer, 1 laborer
			TL	\$33.96	1 tile layer
			TR	\$29.88	1 truck driver

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
A1	\$48.58	1 asbestos worker 1 laborer	F6	\$46.74	2 carpenters, 2 laborers 1 tractor operator
AT	\$41.84	1 air tool operator	F7	\$48.63	2 carpenters, 1 laborer 1 tractor operator
AW	\$57.96	1 asbestos worker	F8	\$49.69	2 plasterers 1 plasterer's helper
BM	\$57.95	1 boilermaker	F9	\$43.75	1 laborer, 1 floor layer
BT	\$39.81	1 bricklayer tender	FL	\$48.30	1 floor layer
C1	\$40.08	4 laborers, 1 truck driver	G1	\$46.03	1 glazier, 1 laborer
C2	\$47.03	1 laborer, 2 truck drivers 2 tractor operators	H1	\$51.72	1 carpenter, 1 laborer 1 iron worker (structural) 1 tractor operator
C3	\$45.72	1 laborer, 1 truck driver 1 tractor operator	H2	\$49.11	1 crane operator 1 truck driver
C4	\$40.67	2 laborers, 1 truck driver	H3	\$44.38	1 carpenter, 3 laborers 1 crane operator 1 truck driver
C5	\$44.09	2 laborers, 1 truck driver 1 tractor operator	H4	\$59.40	1 crane operator 6 iron workers (structural) 1 truck driver
C6	\$43.11	6 laborers, 2 truck drivers 2 tractor operators	H5	\$51.72	1 crane operator 2 iron workers (structural) 2 laborers
C7	\$45.46	2 laborers , 3 truck drivers 1 crane operator 1 tractor operator	H6	\$51.01	1 iron worker (structural) 1 laborer
C8	\$44.85	1 laborer, 1 carpenter	H7	\$60.08	1 crane operator 2 iron workers (structural)
C9	\$46.89	1 laborer, 1 crane operator	H8	\$58.26	1 crane operator 4 iron workers (structural) 1 truck driver
CB	\$51.62	1 bricklayer	H9	\$57.64	1 electrician 1 sheet metal worker
CC	\$50.50	1 carpenter	IW	\$62.83	1 iron worker (structural)
CD	\$49.64	1 drywall Installer	LA	\$46.12	1 lather
CE	\$57.57	1 electrician	M1	\$45.72	1 bricklayer 1 bricklayer's tender
CG	\$52.87	1 glazier	M2	\$42.96	1 carpenter, 2 laborers
CL	\$39.19	1 laborer	M3	\$48.11	1 plasterer 1 plasterer's helper
CM	\$48.71	1 cement mason	M4	\$45.18	1 laborer, 1 marble setter
CO	\$54.58	1 crane operator	M5	\$49.23	1 pipefitter, 1 laborer,
CV	\$54.05	1 elevator constructor	M6	\$52.14	1 asbestos worker 1 laborer, 1 pipefitter
D2	\$44.42	1 drywall installer 1 laborer	M8	\$54.25	3 pipefitters, 1 laborer
D3	\$51.12	1 laborer, 1 iron worker (structural), 1 millwright	M9	\$58.42	1 electrician, 1 pipefitter
D4	\$45.26	1 laborer, 1 millwright	MI	\$52.58	2 pipefitters, 1 laborer
D5	\$48.57	1 boilermaker, 1 laborer	MS	\$51.17	marble setter
D6	\$52.33	2 millwrights 1 tractor operator	MT	\$48.60	mosaic & terrazzo worker
D7	\$44.86	1 painter, 1 laborer	MW	\$51.33	millwright
D9	\$47.28	2 millwrights, 1 laborer			
E1	\$49.57	2 electricians, 2 laborers 1 tractor operator			
E2	\$48.38	2 electricians, 2 laborers			
E3	\$49.09	2 electricians, 2 laborers 2 carpenters			
E4	\$48.38	1 electrician, 1 laborer			
F5	\$45.98	3 carpenters, 2 laborers			

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
P5	\$43.11	3 laborers 1 tractor operator 1 truck driver	S8	\$48.46	2 pile drivers, 2 laborers 1 truck driver 1 crane operator 1 tractor operator
P6	\$49.73	1 laborer, 1 plumber	S9	\$46.10	1 pile driver, 2 laborers 1 tractor operator 1 truck driver
P8	\$43.95	1 laborer, 1 cement mason			
P9	\$46.13	1 carpenter, 1 laborer 1 cement mason			
PA	\$50.52	1 painter	SM	\$57.70	1 sheet metal worker
PD	\$54.13	1 pile driver	SP	\$61.50	1 sprinkler fitter
PF	\$59.27	1 pipefitter	SS	\$49.29	1 laborer 2 tractor operators
PH	\$43.37	1 plasterer's helper			
PL	\$60.27	1 plumber	T2	\$50.53	3 laborers, 3 carpenters 3 iron workers (structural) 1 crane operator 1 truck driver
PS	\$52.85	1 plasterer			
R3	\$44.64	2 roofers, 1 laborer			
RB	\$60.44	1 reinforcing iron worker	T3	\$49.82	1 laborer 1 reinforcing iron worker
RF	\$47.37	1 roofer			
S1	\$46.77	1 laborer 1 tractor operator	T4	\$43.90	1 laborer, 1 mosaic worker
S3	\$48.99	1 truck driver 1 tractor operator	T5	\$48.45	1 sheet metal worker 1 laborer
S4	\$39.19	3 laborers	T6	\$51.53	2 sheet metal workers 1 laborer
S5	\$42.02	5 laborers 1 crane operator 1 truck driver	TD	\$43.64	1 truck driver
S6	\$44.24	2 laborers 1 tractor operator	TO	\$54.34	1 tractor operator
S7	\$46.77	3 laborers 3 tractor operators	U1	\$48.25	1 plumber, 2 laborers 1 tractor operator
			U2	\$46.22	1 plumber, 2 laborers

Residential Division

	1	2	3	4	5	6
Craft	Base wage per hour	Taxable fringe benefits (@5.15% of base wage)	Insurance and employer taxes (%)	Insurance and employer taxes (\$)	Non-taxable fringe benefits (@4.55% of base wage)	Total hourly cost used in this book
Bricklayer	\$26.84	\$1.38	25.34%	\$7.15	\$1.22	\$36.59
Bricklayer's Helper	20.04	1.03	25.34	5.34	0.91	27.32
Building Laborer	20.21	1.04	32.73	6.96	0.92	29.13
Carpenter	25.21	1.30	31.63	8.39	1.15	36.05
Cement Mason	25.38	1.31	23.15	6.18	1.15	34.02
Drywall installer	25.96	1.34	23.57	6.43	1.18	34.91
Drywall Taper	26.49	1.36	23.57	6.56	1.21	35.62
Electrician	29.90	1.54	19.84	6.24	1.36	39.04
Floor Layer	24.13	1.24	23.82	6.04	1.10	32.51
Glazier	25.41	1.31	25.78	6.89	1.16	34.77
Lather	26.42	1.36	21.28	5.91	1.20	34.87
Marble Setter	23.96	1.23	21.36	5.38	1.09	31.66
Millwright	25.64	1.32	21.24	5.73	1.17	33.86
Mosaic & Terrazzo Worker	25.65	1.32	21.36	5.76	1.17	33.90
Operating Engineer	30.04	1.55	25.22	7.97	1.37	40.93
Painter	26.93	1.39	24.88	7.05	1.23	36.60
Plasterer	26.06	1.34	28.58	7.83	1.19	36.42
Plasterer Helper	20.34	1.05	28.58	6.11	0.93	28.43
Plumber	30.80	1.59	24.27	7.86	1.40	41.65
Reinforcing Ironworker	24.37	1.36	28.61	7.93	1.20	36.86
Roofer	25.92	1.33	44.14	12.03	1.18	40.46
Sheet Metal Worker	29.56	1.52	26.01	8.08	1.34	40.50
Sprinkler Fitter	30.25	1.56	25.08	7.98	1.38	41.17
Tile Layer	25.70	1.32	21.36	5.77	1.17	33.96
Truck Driver	21.77	1.12	26.22	6.00	.99	29.88

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 312. 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 2014.

Column 2, taxable fringe benefits, includes vacation pay, sick leave and other taxable benefits. These fringe benefits average 5.15% 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 sec-

tion of this manual beginning on page 186. Taxes are itemized in the section on page 288. 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 4.55% 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 312.

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

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

Then add the regular work hours for the year:

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

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

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

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

10. Continuing with our example, we'll use 31.63%, the rate for carpenters in column 3 on page 10. To increase the annual taxable wage by 31.63%, we'll multiply by 1.3163:

$$\begin{array}{r} \$20,800 \text{ per year} \\ \times 1.3163 \text{ tax \& insurance rate} \\ \hline \$27,379 \text{ annual cost} \end{array}$$

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.

$$\begin{array}{r} \$4,124 \text{ medical plan} \\ + 27,379 \text{ annual cost} \\ \hline \$31,503 \text{ total annual cost} \end{array}$$

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:

$$\frac{\$31,503}{2,000} = \$15.75 \text{ per hour}$$

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 \$36.05.

$$\frac{\$15.75}{\$36.05} = .44$$

Your modification factor is 44%. Multiply any building carpenter (Craft Code BC) labor costs in the Residential Division of this book by .44 to find your estimated cost. For example, on page 24 the labor cost for installing an 18" long towel bar is \$10.10 per each bar. If installed by your carpenter working at \$10.00 per hour, your estimated cost would be 44% of \$10.10 or \$4.44. 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

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.											
Columbia	384	-1	-15	0	-7%	Charlottesville	229	1	-15	0	-6%	Gillette	827	-1	4	0	1%											
Cookeville	385	0	-20	0	-9%	Chesapeake	233	0	-4	0	-2%	Powell	824	0	-15	0	-7%											
Jackson	383	-1	-6	0	-3%	Culpeper	227	2	-11	1	-4%	Rawlins	823	0	2	0	1%											
Kingsport	376	0	-10	0	-5%	Farmville	239	-2	-26	-1	-13%	Riverton	825	-1	-10	0	-5%											
Knoxville	377-379	-1	-2	0	-1%	Fredericksburg	224-225	1	-11	0	-5%	Rock Springs	828-831	0	2	0	1%											
McKenzie	382	-1	-11	0	-6%	Galax	243	-2	-19	-1	-10%	Sheridan	828	0	-12	0	-6%											
Memphis	380-381	-2	5	-1	1%	Harrisonburg	228	1	-19	0	-8%	Wheatland	822	0	-18	0	-8%											
Nashville	371-372	1	10	0	5%	Lynchburg	245	-2	-16	-1	-8%	UNITED STATES TERRITORIES																
Texas Average						-2	-1	-1	-2%	Norfolk	235-237	0	-3	0	-1%	Guam	53	-21	-5	18%								
Abilene	795-796	-4	-4	-1	-4%	Petersburg	238	-2	-7	-1	-4%	Puerto Rico	2	-47	-5	-21%												
Amarillo	790-791	-2	-6	-1	-4%	Radford	241	-1	-21	0	-10%	VIRGIN ISLANDS (U.S.)																
Arlington	760	-1	3	0	1%	Reston	201	3	14	1	8%	St. Croix	18	-15	-4	2%												
Austin	786-787	1	5	0	3%	Richmond	232	-1	1	0	0%	St. John	52	-15	-4	20%												
Bay City	774	-2	50	-1	22%	Roanoke	240	-1	-21	0	-10%	St. Thomas	23	-15	-4	5%												
Beaumont	776-777	-3	22	-1	9%	Staunton	244	0	-22	0	-10%	CANADIAN AREA MODIFIERS																
Brownwood	768	-3	-17	-1	-9%	Tazewell	246	-3	-11	-1	-7%	These figures assume an exchange rate of \$1.00 Canadian to \$0.95 U.S.																
Bryan	778	0	-10	0	-5%	Virginia Beach	234	0	-9	0	-4%	Alberta Average	20	5	7	13%												
Childress	792	-3	-26	-1	-14%	Williamsburg	230-231	0	-9	0	-4%	Calgary	20	7	7	14%												
Corpus Christi	783-784	-2	11	-1	4%	Winchester	226	0	-11	0	-5%	Edmonton	19	8	7	14%												
Dallas	751-753	-1	11	0	5%	Washington Average					1	-2	0	0%	Fort McMurray	22	-1	7	11%									
Del Rio	788	-3	-14	-1	-8%	Clarkston	994	0	-12	0	-6%	British Columbia Average					20	-9	7	7%								
El Paso	798-799	-3	-21	-1	-11%	Everett	982	2	3	1	2%	Fraser Valley	20	-10	7	6%												
Fort Worth	761-762	-2	3	-1	0%	Olympia	985	2	-7	1	-2%	Okanagan	21	-12	7	6%												
Galveston	775	-3	22	-1	9%	Pasco	993	0	2	0	1%	Vancouver	20	-5	7	8%												
Giddings	789	0	-3	0	-1%	Seattle	980-981	3	20	1	11%	Manitoba Average					14	-16	5	0%								
Greenville	754	-3	10	-1	3%	Spokane	990-992	0	-6	0	-3%	North Manitoba	14	-16	5	0%												
Houston	770-772	-1	24	0	11%	Tacoma	983-984	1	4	0	2%	South Manitoba	14	-16	5	0%												
Huntsville	773	-2	23	-1	10%	Vancouver	986	2	4	1	3%	Selkirk	14	-16	5	0%												
Longview	756	-2	-2	-1	-2%	Wenatchee	988	1	-13	0	-5%	Winnipeg	14	-16	5	0%												
Lubbock	793-794	-3	-12	-1	-7%	Yakima	989	0	-10	0	-5%	New Brunswick Average					10	-41	3	-14%								
Lufkin	759	-3	-9	-1	-6%	West Virginia Average					-2	-9	-1	-5%	Moncton	10	-41	3	-14%									
McAllen	785	-3	-26	-1	-14%	Beckley	258-259	1	-15	0	-6%	Nova Scotia Average					11	-30	4	-8%								
Midland	797	-3	18	-1	7%	Bluefield	247-248	-1	2	0	0%	Amherst	10	-30	3	-9%												
Palestine	758	-2	-13	-1	-7%	Charleston	250-253	1	7	0	4%	Nova Scotia	11	-29	4	-8%												
Plano	750	-1	12	0	5%	Clarksburg	263-264	-3	-6	-1	-4%	Sydney	11	-31	4	-8%												
San Angelo	769	-3	-13	-1	-8%	Fairmont	266	0	-23	0	-11%	Newfoundland/Labrador Average					13	-29	4	-6%								
San Antonio	780-782	-3	0	-1	-2%	Huntington	255-257	-1	-2	0	-1%	Ontario Average	16	-5	5	6%												
Texarkana	755	-3	-17	-1	-9%	Lewisburg	249	-2	-31	-1	-15%	London	16	-4	5	7%												
Tyler	757	-1	-13	0	-5%	Martinsburg	254	-1	-9	0	-5%	Thunder Bay	18	-8	6	6%												
Victoria	779	-3	1	-1	-1%	Morgantown	265	-3	-9	-1	-6%	Toronto	15	-3	5	7%												
Waco	765-767	-3	-10	-1	-6%	New Martinsville	262	-2	-17	-1	-9%	Quebec Average					13	-18	4	-1%								
Wichita Falls	763	-3	-20	-1	-11%	Parkersburg	261	-3	5	-1	1%	Montreal	13	-18	4	-1%												
Woodson	764	-3	-10	-1	-6%	Romney	267	-4	-11	-1	-7%	Quebec City	13	-18	4	-1%												
Utah Average						1	-10	1	-4%	Sugar Grove	268	-3	-12	-1	-7%	Saskatchewan Average					17	-12	5	3%				
Clearfield	840	2	-1	1	1%	Wheeling	260	-3	-2	-1	-3%	La Ronge	18	-15	6	3%												
Green River	845	1	-5	0	-2%	Wisconsin Average					-1	1	0	0%	Prince Albert	16	-14	5	2%									
Ogden	843-844	0	-22	0	-10%	Amery	540	0	-3	0	-1%	Saskatoon	16	-8	5	5%												
Provo	846-847	2	-21	1	-9%	Beloit	535	0	9	0	4%																	
Salt Lake City	841	2	0	1	1%	Clam Lake	545	-1	-12	0	-6%																	
Vermont Average						1	-12	0	-5%	Eau Claire	547	-1	-2	0	-1%													
Albany	058	1	-15	0	-6%	Green Bay	541-543	0	4	0	2%																	
Battleboro	053	1	-11	0	-5%	La Crosse	546	-2	-2	-1	-2%																	
Beecher Falls	059	1	-17	0	-7%	Ladysmith	548	-2	-2	-1	-2%																	
Bennington	052	-1	-16	0	-8%	Madison	537	2	13	1	7%																	
Burlington	054	2	3	1	2%	Milwaukee	530-534	0	13	0	6%																	
Montpelier	056	2	-10	1	-4%	Oshkosh	549	-1	5	0	2%																	
Rutland	057	-1	-15	0	-7%	Portage	539	0	6	0	3%																	
Springfield	051	-1	-14	0	-7%	Prairie du Chien	538	-2	-6	-1	-4%																	
White River Junction	050	1	-14	0	-6%	Wausau	544	-1	-5	0	-3%																	
Virginia Average						0	-10	0	-5%	Wyoming Average					0	-6	0	-3%										
Abingdon	242	-2	-16	-1	-8%	Casper	826	-2	8	-1	3%																	
Alexandria	220-223	3	18	1	10%	Cheyenne/Laramie	820	1	-11	0	-5%																	

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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. Based on 10.5 ounce tubes.

	Unit	Bead diameter			
		1/8"	1/4"	3/8"	1/2"
Subfloor adhesive, on floors					
12" OC members	CSF	1.64	6.54	14.70	26.20
16" OC members	CSF	1.23	4.91	11.00	19.60
20" OC members	CSF	.98	3.93	8.83	15.70
24" OC members	CSF	.82	3.27	7.36	13.10
Wall sheathing or shear panel adhesive, on walls					
16" OC members	CSF	2.81	11.30	25.30	45.00
20" OC members	CSF	2.25	9.00	20.30	36.00
24" OC members	CSF	1.88	7.50	16.90	30.00
Polystyrene or polyurethane foam panel adhesive, on walls					
12" OC members	CSF	3.49	14.00	31.40	55.80
16" OC members	CSF	2.62	10.50	23.50	41.90
20" OC members	CSF	2.09	8.37	18.80	33.50
24" OC members	CSF	1.74	6.98	15.70	27.90
Gypsum drywall adhesive					
12" OC members	CSF	1.36	5.43	12.20	21.70
16" OC members	CSF	1.02	4.07	9.17	16.30
20" OC members	CSF	.81	3.26	7.33	13.00
24" OC members	CSF	.68	2.72	6.11	10.90
Hardboard or plastic panel adhesive, on walls					
12" OC members	CSF	3.11	12.40	28.00	49.80
16" OC members	CSF	2.33	9.33	21.00	37.30
20" OC members	CSF	1.87	7.46	16.80	29.90
24" OC members	CSF	1.56	6.22	14.00	24.90
	Craft@Hrs	Unit	Material	Labor	Total
Labor to apply adhesive to framing members, 1/8" to 1/2" bead diameter, no material included					
Floor or ceiling joists					
12" OC members	BC@.075	CSF	—	2.70	2.70
16" OC members	BC@.056	CSF	—	2.02	2.02
20" OC members	BC@.052	CSF	—	1.87	1.87
24" OC members	BC@.042	CSF	—	1.51	1.51
Interior and exterior wall members					
12" OC members	BC@.100	CSF	—	3.61	3.61
16" OC members	BC@.090	CSF	—	3.24	3.24
20" OC members	BC@.084	CSF	—	3.03	3.03
24" OC members	BC@.084	CSF	—	3.03	3.03

Special purpose adhesives

Construction adhesive, for counters, cabinets, paneling, brick veneer, ceramic fixtures, shelving, sets in 10 minutes, 10.5 oz cartridge	—	Ea	2.89	—	2.89
Epoxy-tie adhesive, bonds concrete, fills cracks to 3/4", seals doors and windows, anchor grouting, non-shrink, 22 oz. cartridge	—	Ea	22.40	—	22.40
Gypsum drywall adhesive, waterproof, bonds to wood, metal, masonry, concrete, 29 oz. cartridge	—	Ea	4.29	—	4.29

Adhesives

	Craft@Hrs	Unit	Material	Labor	Total
Latex FRP adhesive, indoor, bonds wood, concrete, drywall, foamboard, trowel grade, gallon	—	Ea	15.60	—	15.60
Panel insulation adhesive, waterproof, for polyurethane & polystyrene panels, bonds to wood, metal, masonry, concrete, 16 oz	—	Ea	31.00	—	31.00
Marine adhesive/sealant, 10 oz.	—	Ea	12.00	—	12.00
Project adhesive, rubber-based, bonds plywood, hardboard fiberglass, drywall, foam board, shelving, ceramic fixtures, 10 minute work time, 10.5 oz cartridge	—	Ea	2.89	—	2.89

	Unit	1 quart can	1 gallon can
General purpose adhesives			
Acoustic tile adhesive, solvent base, waterproof, sound deadening type	Ea	—	20.70
Aliphatic resin woodworking glue	Ea	10.10	23.30
Carpet cement, outdoor	Ea	12.70	—
Professional carpenter's glue, multi-purpose	Ea	—	21.20
Contact cement, rubber based, waterproof, bonds veneers to plywood, particleboard, wallboard	Ea	17.00	33.90
Gel contact cement	Ea	15.40	—
Resilient flooring adhesive, latex base, adheres to concrete, plywood, felt, sheet flooring	Ea	7.41	18.60
Tile cement, solvent base, ceramic/stone, interior	Ea	11.30	28.60

	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	23.00	—	23.00
3/4" (Number 3)	—	Ton	21.90	—	21.90
1-1/2" (Number 2)	—	Ton	23.00	—	23.00
Crushed slag, typical prices where available					
3/4" slag	—	Ton	14.80	—	14.80
1-1/2"	—	Ton	15.10	—	15.10
Washed gravel (1.4 tons per CY)					
3/4" gravel	—	Ton	23.00	—	23.00
1-1/2"	—	Ton	23.10	—	23.10
Fill sand (1.35 tons per CY)	—	Ton	10.70	—	10.70
Add per ton less than 24 tons	—	Ton	7.00	—	7.00
Add for delivery over 5 miles, one way	—	Mile	9.50	—	9.50

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 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, quadriplex)					
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.

Arbitration and Mediation Fees

	Unit	Initial Filing Fee	Case Service Fee
Claims to \$10,000	LS	775.00	200.00
Claims over \$10,000 to \$75,000	LS	975.00	300.00
Claims over \$75,000 to \$150,000	LS	1,850.00	750.00
Claims over \$150,000 to \$300,000	LS	2,800.00	1,250.00
Claims over \$300,000 to \$500,000	LS	4,350.00	1,750.00
Claims over \$500,000 to \$1,000,000	LS	6,200.00	2,500.00
Claims over \$1,000,000 to \$5,000,000	LS	8,200.00	3,250.00
Claims over \$5,000,000 to \$10,000,000	LS	10,200.00	4,000.00
Claims over \$10,000,000 *	LS	*	6,000.00
No Amount Stated **	LS	3,350.00	1,250.00

* \$10 million and above – Base fee is \$12,800 plus .01% of the amount of claim above \$10 million. Filing fees are capped at \$65,000.

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

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

Nonrefundable retainer (half from each party)	—	Ea	—	—	321.00
Weekday sessions after the initial consultation	—	Hr	—	—	161.00
Nonrefundable retainer for weekend mediation	—	Ea	—	—	388.00
Weekend mediation sessions	—	Hr	—	—	192.00

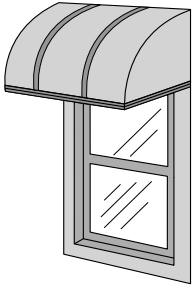
Architectural Illustrations Full color painting on watercolor board with matted frame with title and credit on matte. Glass and elaborate framing are extra. Costs for pen and ink illustrations with color Mylar overlay are similar to cost for watercolor illustrations. Typical fees.



Custom home, eye level view					
Simple rendering	—	LS	—	—	900.00
Complex rendering	—	LS	—	—	1,325.00
Custom home, bird's eye view					
Simple rendering	—	LS	—	—	1,090.00
Complex rendering	—	LS	—	—	1,550.00
Tract homes in groups of five or more (single floor plans, multiple elevations), eye level view					
Simple rendering	—	LS	—	—	535.00
Complex rendering	—	LS	—	—	735.00
Tract homes in groups of five or more (single floor plans, multiple elevations), bird's eye view					
Simple rendering	—	LS	—	—	685.00
Complex rendering	—	LS	—	—	1,100.00
Tract homes or condominium project, overall bird's eye view					
10-25 homes or living units	—	LS	—	—	3,390.00
Typical commercial structure					
Eye level view	—	LS	—	—	1,490.00
Bird's eye view	—	LS	—	—	1,680.00
Complex commercial structure					
Eye level view	—	LS	—	—	2,200.00
Bird's eye view	—	LS	—	—	2,840.00

Awnings and Canopies

	Craft@Hrs	Unit	Material	Labor	Total
Deduct for pen and ink drawings (no color)	—	%	—	—	-33.0
Computer generated perspective drawings using CAD system for design studies					
Custom home	—	LS	—	—	575.00
Large condo or apartment projects	—	LS	—	—	1,440.00
Tract homes	—	LS	—	—	359.00
Commercial structure, line drawing	—	LS	—	—	1,080.00

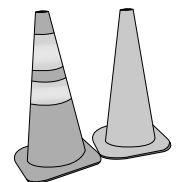


Awnings and Canopies for Doors and Windows Costs for awnings include all hardware. All have adjustable support arms to control angle height and preferred amount of window coverage. For larger size aluminum awnings, price two awnings and add for splice kit below. For commercial grade awnings, see the Industrial and Commercial Division section 10, Specialties.

Natural aluminum ribbed awning with clear, weather-resistant finish and 26" arms					
36" wide x 30" long	SW@1.45	Ea	63.10	58.70	121.80
48" wide x 30" long	SW@1.86	Ea	81.50	75.30	156.80
60" wide x 30" long	SW@2.07	Ea	101.00	83.80	184.80
72" wide x 30" long	SW@2.27	Ea	114.00	91.90	205.90
Add for door canopy with 17" drop sides	—	%	50.0	—	—
Custom colored window awnings in stripes or solids, with baked enamel finish and ventilation panels					
30" wide x 24" high	SW@1.45	Ea	102.00	58.70	160.70
36" wide x 36" high	SW@1.45	Ea	154.00	58.70	212.70
48" wide x 48" high	SW@1.87	Ea	260.00	75.70	335.70
48" wide x 60" high	SW@1.87	Ea	368.00	75.70	443.70
60" wide x 72" high	SW@2.07	Ea	403.00	83.80	486.80
72" wide x 72" high	SW@2.26	Ea	552.00	91.50	643.50
Add for splice kit with overlap slats	SW@.218	Ea	21.30	8.83	30.13
Security roll-up awning with pull cord assembly and folding arms, clear weather-resistant finish. Awning rolls down to cover whole window. 48" long, 24" arms					
36" wide	SW@1.52	Ea	195.00	61.60	256.60
48" wide	SW@1.94	Ea	234.00	78.60	312.60
Plastic awning with baked-on acrylic finish, ventilated side panels, and reinforced metal frame, hardware included. 24" drop, 24" projection					
36" wide	BC@1.58	Ea	150.00	57.00	207.00
42" wide	BC@1.75	Ea	167.00	63.10	230.10
48" wide	BC@2.02	Ea	192.00	72.80	264.80
60" wide	BC@2.26	Ea	215.00	81.50	296.50
72" wide	BC@2.47	Ea	231.00	89.00	320.00
96" wide	BC@2.79	Ea	293.00	101.00	394.00
Plastic door canopy with 36" projection					
42" wide	BC@1.80	Ea	316.00	64.90	380.90
Traditional fabric awning, with waterproof, acrylic duck, colorfast fabric, double stitched seams, and tubular metal framing and pull cord assembly. 24" drop, 24" projection					
30" wide	BC@1.35	Ea	53.90	48.70	102.60
36" wide	BC@1.58	Ea	70.80	57.00	127.80
42" wide	BC@1.80	Ea	66.00	64.90	130.90
48" wide	BC@2.02	Ea	77.50	72.80	150.30
Add for 30" drop, 30" projection	—	%	10.0	20.0	—
Cloth canopy patio cover, with front bar and tension support rafters, 9" valance and 8' projection					
8' x 10'	BC@2.03	Ea	327.00	73.20	400.20
8' x 15'	BC@2.03	Ea	450.00	73.20	523.20

Barricades, Construction Safety

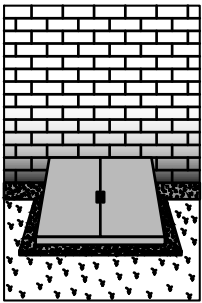
	Craft@Hrs	Unit	Material	Labor	Total
Barricades, Construction Safety Purchase prices except as noted. See also Equipment Rental in the index.					
Heavy Duty Plastic Type I barricade, Engineer Grade Reflectivity, 8" height Top Panel					
Quantities from 1 - 15 units	—	Ea	46.00	—	46.00
Quantities from 16 - 31 units	—	Ea	41.00	—	41.00
Pallet quantities, multiples of 32 units	—	Ea	38.00	—	38.00
Reflectorized plastic, injected barricade, NCHRP-350 certified meets MUTCD specifications 8" to 12" wide rail, 4" to 6" wide stripes, 40" legs, no light					
Type I, 2' wide, 3' high, Top panel 12" height, 1 reflectorized rail each side					
Quantities from 1 - 15 units	—	Ea	53.00	—	53.00
Quantities from 16 - 31 units	—	Ea	46.00	—	46.00
Pallet quantities, multiples of 32 units	—	Ea	41.00	—	41.00
Type II, 2' wide, 3' high, Top panel 8" height, 1 reflectorized rail each side					
Quantities from 1 - 15 units	—	Ea	60.50	—	60.50
Quantities from 16 - 31 units	—	Ea	53.20	—	53.20
Pallet quantities, multiples of 32 units	—	Ea	48.00	—	48.00
Type III, 4' wide, 5' high, 3 reflectorized rails each side, wood & steel legs					
Quantities from 1 - 15 units	—	Ea	115.00	—	115.00
Quantities from 16 - 31 units	—	Ea	105.00	—	105.00
Pallet quantities, multiples of 32 units	—	Ea	98.50	—	98.50
Add for lighted units without batteries (batteries last 2 months)					
Amber lens	—	Ea	18.80	—	18.80
Red lens	—	Ea	19.70	—	19.70
Batteries, 6 volt (2 needed)	—	Ea	4.75	—	4.75
Utility barricade lights, solar powered Utility barricade solar powered lights, compliant with M.U.T.C.D. Specification 6E-5 and ITE Specifications for Flashing / Steady Burn warning light, 180 degree swivel base axis.					
Utility barricade solar powered lights	—	Ea	45.00	—	45.00
Miscellaneous signage/traffic control					
"Road Closed", reflectorized, 30" x 48", Engineer Grade					
	—	Ea	83.60	—	83.60
"Construction Zone", 4' x 4' high intensity grade					
	—	Ea	230.00	—	230.00
High-rise tripod with 3 orange flags					
	—	Ea	187.00	—	187.00
Flags					
	—	Ea	3.65	—	3.65
Traffic cones, PVC					
Non-reflectorized type					
18" high	—	Ea	10.80	—	10.80
28" high	—	Ea	14.70	—	14.70
Reflectorized type					
18" high	—	Ea	11.50	—	11.50
28" high	—	Ea	19.90	—	19.90
Lane delineator, 42" orange plastic cylinder with 2 reflectors on a 12 pound rubber base					
	—	Ea	20.20	—	20.20
Mesh signs, orange, 48" x 48", includes brace and clamp					
	—	Ea	66.50	—	66.50
Hand-held traffic paddles, "Stop" and "Slow"					
	—	Ea	26.20	—	26.20



Basement Doors

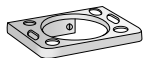
	Craft@Hrs	Unit	Material	Labor	Total
Utility Highway Barricade Rental					
Lighted units, rental, per day	—	Ea	.35	—	.35
Unlighted units, rental per day	—	Ea	.25	—	.25
Add for pickup and delivery, per trip	—	Ea	35.00	—	35.00
Typical labor cost, place and remove any barricade					
Per use	BL@.160	Ea	—	4.66	4.66
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	61.20	—	61.20
Medium Weight 4' x 100', opening 2" x 2.5"	—	Ea	39.70	—	39.70
Barricade tape for marking construction sites, landscaping, wet paint					
Yellow plastic 3" x 1,000', "Caution"	—	Ea	8.29	—	8.29
Various colors, 3" x 200', "Danger"	—	Ea	5.68	—	5.68

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.

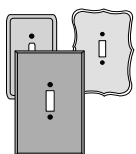


Doors (overall dimensions)					
Classic Series standard, all sizes	BC@3.41	Ea	800.00	123.00	923.00
SLW Series standard, all sizes	BC@3.41	Ea	829.00	123.00	952.00
Ultra Series,	BC@3.41	Ea	1,100.00	123.00	1,223.00
Add for keyed lock	BC@.160	Ea	97.20	5.77	102.97
Door extensions (available for 19-1/2"H, 55"W, 72"L door only)					
6" deep	BC@1.71	Ea	198.00	61.60	259.60
12" deep	BC@1.71	Ea	259.00	61.60	320.60
18" deep	BC@1.71	Ea	323.00	61.60	384.60
Stair stringers, steel, pre-cut for 2" x 10" wood treads (without treads)					
32" to 39" stair height	BC@1.71	Ea	93.50	61.60	155.10
48" to 55" stair height	BC@1.71	Ea	118.00	61.60	179.60
56" to 64" stair height	BC@1.71	Ea	131.00	61.60	192.60
65" to 72" stair height	BC@1.71	Ea	147.00	61.60	208.60
73" to 78" stair height	BC@1.71	Ea	203.00	61.60	264.60
81" to 88" stair height	BC@1.71	Ea	220.00	61.60	281.60
89" to 97" stair height	BC@1.71	Ea	235.00	61.60	296.60

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




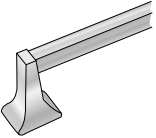
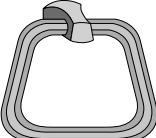


Cup and toothbrush holder, chrome	BC@.258	Ea	11.40	9.30	20.70
Cup holder, porcelain, surface mounted	BC@.258	Ea	7.99	9.30	17.29
Cup, toothbrush & soap holder, recessed	BC@.258	Ea	30.20	9.30	39.50
Cup, toothbrush holder, polished brass	BC@.258	Ea	16.10	9.30	25.40

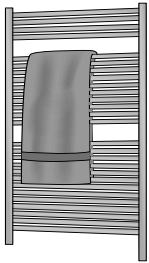


Electrical plates, chrome plated					
Switch plate, single	BE@.154	Ea	4.24	6.01	10.25
Switch plate, double	BE@.154	Ea	5.60	6.01	11.61
Duplex receptacle plate	BE@.154	Ea	4.24	6.01	10.25
Duplex receptacle and switch	BE@.154	Ea	5.60	6.01	11.61

Bathroom Accessories

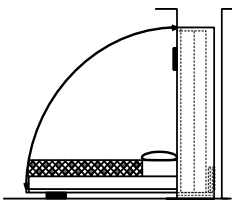
	Craft@Hrs	Unit	Material	Labor	Total	
Grab bars						
Tubular chrome plated, with anchor plates						
Straight bar, 16"	BC@.414	Ea	24.90	14.90	39.80	
Straight bar, 24"	BC@.414	Ea	30.20	14.90	45.10	
Straight bar, 32"	BC@.414	Ea	32.90	14.90	47.80	
"L"- shaped bar, 16" x 32"	BC@.620	Ea	76.10	22.40	98.50	
Stainless steel, with anchor plates						
Straight bar, 16"	BC@.414	Ea	37.60	14.90	52.50	
Straight bar, 24"	BC@.414	Ea	45.30	14.90	60.20	
Straight bar, 32"	BC@.414	Ea	49.10	14.90	64.00	
"L"- shaped bar, 16" x 32"	BC@.620	Ea	106.00	22.40	128.40	
Mirrors, stainless steel framed, surface mount, no light or cabinet						
16" high x 20" wide	BG@.420	Ea	60.00	14.60	74.60	
18" high x 24" wide	BG@.420	Ea	69.70	14.60	84.30	
18" high x 36" wide	BG@.420	Ea	107.00	14.60	121.60	
24" high x 36" wide	BG@.420	Ea	125.00	14.60	139.60	
48" high x 24" wide	BG@.420	Ea	154.00	14.60	168.60	
Mirrors, wood framed, surface mount, better quality						
18" x 29" rectangular	BG@.420	Ea	74.50	14.60	89.10	
20" x 27" oval, oak	BG@.420	Ea	106.00	14.60	120.60	
Robe hook						
Chrome	BC@.258	Ea	22.30	9.30	31.60	
Double, solid brass	BC@.258	Ea	21.50	9.30	30.80	
Shower curtain rods, chrome plated						
60", recessed	BC@.730	Ea	26.10	26.30	52.40	
66", recessed	BC@.730	Ea	28.70	26.30	55.00	
Soap holder, surface mounted, with drain holes						
Williamsburg, satin chrome	BC@.258	Ea	53.20	9.30	62.50	
Polished brass	BC@.258	Ea	17.40	9.30	26.70	
Facial tissue holder, stainless steel, recessed	BC@.258	Ea	35.80	9.30	45.10	
Toilet tissue roll holder, chrome, recessed	BC@.258	Ea	16.70	9.30	26.00	
Toothbrush holder, chrome, surface mount	BC@.258	Ea	6.17	9.30	15.47	
Towel bars, 3/4" round bar						
18" long, chrome	BC@.280	Ea	13.70	10.10	23.80	
24" long, chrome	BC@.280	Ea	16.20	10.10	26.30	
30" long, chrome	BC@.280	Ea	19.20	10.10	29.30	
36" long, chrome	BC@.280	Ea	21.90	10.10	32.00	
18" long, solid brass	BC@.280	Ea	44.50	10.10	54.60	
24" long, solid brass	BC@.280	Ea	46.80	10.10	56.90	
Towel rack, swing-arm, chrome, 3 bars, 12" L	BC@.280	Ea	15.50	10.10	25.60	
Towel rings						
Williamsburg chrome and brass	BC@.280	Ea	42.20	10.10	52.30	
Williamsburg chrome and porcelain	BC@.280	Ea	40.30	10.10	50.40	
Towel shelf, chrome, 24" L with bar below	BC@.280	Ea	39.30	10.10	49.40	
Heated towel racks, 16" and 24" width, mounted on wall with brackets. Direct wire connection, 700 watt output. Add for electrical work						
26" high, 16" wide, standard colors	BE@.850	Ea	705.00	33.20	738.20	
26" high, 24" wide, standard colors	BE@.850	Ea	750.00	33.20	783.20	
26" high, 24" wide, chrome finish	BE@.850	Ea	2,330.00	33.20	2,363.20	

Beds, Folding



	Craft@Hrs	Unit	Material	Labor	Total
35" high, 16" wide, standard colors	BE@1.00	Ea	790.00	39.00	829.00
35" high, 24" wide, standard colors	BE@1.00	Ea	835.00	39.00	874.00
35" high, 24" wide, chrome finish	BE@1.00	Ea	2,790.00	39.00	2,829.00
44" high, 16" wide, standard colors	BE@1.10	Ea	880.00	42.90	922.90
44" high, 24" wide, standard colors	BE@1.10	Ea	930.00	42.90	972.90
44" high, 24" wide, chrome finish	BE@1.10	Ea	3,060.00	42.90	3,102.90
Add for direct wire w/ control panel	BE@.100	Ea	195.00	3.90	198.90
Add for wall plug in	BE@.100	Ea	260.00	3.90	263.90
Heated towel rack accessories					
Programmable control panel	BE@.250	Ea	250.00	9.76	259.76
Pull out drying racks	BE@.250	Ea	70.00	9.76	79.76
Robe knobs	BE@.150	Ea	45.00	5.86	50.86
Towel bar accents with standard colors	BE@.150	Ea	90.00	5.86	95.86
Towel bar accents with chrome finish	BE@.150	Ea	121.00	5.86	126.86
Robe knob accents (all styles)	BE@.150	Ea	209.00	5.86	214.86
Tub or shower chairs					
Wall-hung elevated fixed seat	BE@.750	Ea	32.30	29.30	61.60
White adjustable seat	BE@.750	Ea	60.10	29.30	89.40

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



Twin, frames and mechanisms	B1@5.41	Ea	795.00	176.00	971.00
Double, frames and mechanisms	B1@5.41	Ea	832.00	176.00	1,008.00
Queen, frames and mechanisms	B1@5.41	Ea	869.00	176.00	1,045.00
King, frames and mechanisms	B1@5.41	Ea	954.00	176.00	1,130.00
Add for wood-tone melamine cabinet	—	LS	1,410.00	—	1,410.00
Add for white melamine cabinet	—	LS	1,250.00	—	1,250.00

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

Blueline or blackline prints					
1-100 SF	—	SF	—	—	.20
101-1,000 SF	—	SF	—	—	.18
1,001-2,000 SF	—	SF	—	—	.17
2,001-to 3,000 SF	—	SF	—	—	.16
3,001-4,000 SF	—	SF	—	—	.09
4,001 SF and higher	—	SF	—	—	.08
Presentation blackline (heavy paper)	—	SF	—	—	.50
Sepia	—	SF	—	—	.76
Mylar	—	SF	—	—	2.52
Xerographic prints					
Vellum	—	SF	—	—	1.01
Erasable vellum	—	SF	—	—	1.26
Mylar	—	SF	—	—	2.52
Enlargements (bond)	—	SF	—	—	.60
Reductions (bond, per sheet)	—	Ea	—	—	2.52

Industrial and Commercial Division Contents

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Industrial and Commercial Division

Hourly Labor Costs

The hourly labor costs shown in the column headed "Hourly Cost" have been used to compute the manhour costs for the crews on pages 8 and 9 and the costs in the "Labor" column on pages 312 to 644 of this book. All figures are in U.S. dollars per hour.

"Hourly Wage and Benefits" includes the wage, welfare, pension, vacation, apprentice and other mandatory contributions. The "Typical Employer's Burden" is the cost to the contractor for Unemployment Insurance (FUTA), Social Security (FICA) and Medicare, state unemployment insurance, workers' compensation insurance and liability insurance. Tax and insurance expense included in these labor-hour costs are itemized in the sections beginning on pages 186 and 288.

These hourly labor costs will apply within a few percent on many jobs. But wages may be much higher or lower on the job you are estimating. If the hourly cost on this page is not accurate for your jobs, use the labor cost adjustment procedure on page 11.

If your hourly labor cost is not known and can't be estimated, use both labor and material figures in this book without adjustment. When all material and labor costs have been compiled, multiply the total by the appropriate figure in the area modification table on pages 12 through 15.

Craft	Hourly Wage and Benefits (\$)	Typical Employer Burden (%)	Employer's Burden Per Hour (\$)	Hourly Cost (\$)
Air Tool Operator	30.78	35.92%	11.06	41.84
Asbestos Worker	37.31	37.17%	20.65	57.96
Boilermaker	38.47	36.59%	19.48	57.95
Bricklayer	34.74	32.03%	16.88	51.62
Bricklayer Tender	26.70	32.03%	13.11	39.81
Building Laborer	27.39	32.16%	11.80	39.19
Carpenter	34.28	31.06%	16.22	50.50
Cement Mason	32.64	33.33%	16.07	48.71
Crane Operator	35.23	36.00%	19.35	54.58
Drywall Installer	33.96	29.25%	15.68	49.64
Electrician	39.47	28.31%	18.10	57.57
Elevator Constructor	36.58	27.02%	17.47	54.05
Floor Layer	32.81	33.52%	15.49	48.30
Glazier	34.54	30.90%	18.33	52.87
Iron Worker (Structural)	37.50	47.12%	25.33	62.83
Lather	31.42	30.97%	14.70	46.12
Marble Setter	34.31	31.06%	16.68	51.17
Millwright	34.86	30.94%	16.47	51.33
Mosaic & Terrazzo Worker	32.26	31.06%	16.34	48.60
Painter	34.09	30.90%	16.43	50.52
Pile Driver	34.56	35.41%	19.57	54.13
Pipefitter	39.36	31.25%	19.91	59.27
Plasterer	35.34	33.39%	17.51	52.85
Plasterer Helper	29.39	33.39%	13.98	43.37
Plumber	40.03	31.25%	20.24	60.27
Reinforcing Ironworker	36.58	38.31%	23.86	60.44
Roofer	30.52	37.01%	16.85	47.37
Sheet Metal Worker	38.92	30.33%	18.78	57.70
Sprinkler Fitter	41.25	29.91%	20.25	61.50
Tractor Operator	35.11	35.92%	19.23	54.34
Truck Driver	28.46	35.92%	15.18	43.64

01 General Requirements

General Contractor's Markup Costs in this manual do not include the general contractor's markup. Costs in sections identified as *subcontract* are representative of prices quoted by subcontractors and include the subcontractor's markup. See pages 3 through 5 for more on subcontracted work and markup. Typical markup for general contractors handling commercial and industrial projects is shown at the bottom of this page. The two sections that follow, Indirect Overhead and Direct Overhead, give a more detailed breakdown.

Indirect Overhead (home office overhead)

This cost, usually estimated as a percentage, is calculated by dividing average annual indirect overhead costs by average annual receipts. Indirect overhead usually doesn't increase or decrease as quickly as gross volume increases or decreases. Home office expense may be about the same even if annual sales double or drop by one-half or more.

The figures below show typical indirect overhead costs per \$1,000 of estimated project costs for a general contractor handling \$600,000 to \$1,000,000 commercial and industrial projects. Indirect overhead costs vary widely but will be about 8% of gross for most profitable firms. Total indirect overhead cost (\$20.00 per \$1,000 for materials and \$60.00 per \$1,000 for labor) appears as 2.0% and 6.0% under Total General Contractor's Markup at the bottom of this page.

	Craft@Hrs	Unit	Material	Labor	Total
Rent, office supplies, utilities, equipment, advertising, etc.	—	M\$	20.00	—	20.00
Office salaries and professional fees	—	M\$	—	60.00	60.00
General Contractor's indirect overhead	—	M\$	20.00	60.00	80.00

Direct Overhead (job site overhead)

The figures below show typical direct overhead costs per \$1,000 of a project's total estimated costs for a general contractor handling a \$600,000 to \$1,000,000 job that requires 6 to 9 months for completion. Use these figures for preliminary estimates and to check final bids. Add the cost of mobilization, watchmen, fencing, hoisting, permits, bonds, scaffolding and testing. Total direct overhead cost (\$14.30 per \$1,000 for materials and \$58.70 per \$1,000 for labor) appears as 1.4% and 5.9% under Total General Contractor's Markup at the bottom of this page. These costs can be expected to vary and will usually be lower on larger projects.

Job supervision	—	M\$	—	44.00	44.00
Truck and fuel for superintendent (\$450 per month)	—	M\$	4.50	—	4.50
Temporary power, light and heat (\$250 per month)	—	M\$	2.50	—	2.50
Temporary water (\$100 per month)	—	M\$	1.00	—	1.00
Cellular phone (\$50 per month)	—	M\$.50	—	.50
Job site toilets (\$100 per month)	—	M\$	1.00	—	1.00
Job site office trailer 8' x 30' (\$150 per month)	—	M\$	1.50	—	1.50
Storage bin and tool shed 8' x 24' (\$80 per month)	—	M\$.80	—	.80
Job site cleanup & debris removal (\$300 per month)	—	M\$	—	3.00	3.00
Job signs & first aid equipment (\$50 per month)	—	M\$.50	—	.50
Small tools, supplies (\$200 per month)	—	M\$	2.00	—	2.00
Taxes and insurance on wages (at 24.9%)	—	M\$	—	11.70	11.70
Total General Contractor's direct overhead	—	M\$	14.30	58.70	73.00

Total General Contractor's Markup Typical costs for commercial and industrial projects.

Indirect overhead (home office overhead)	—	%	2.0	6.0	8.0
Direct overhead (job site overhead)	—	%	1.4	5.9	7.3
Contingency (allowance for unknown conditions)	—	%	—	—	2.0
Profit (varies widely, mid-range shown)	—	%	—	—	7.5
Total General Contractor's markup	—	%	—	—	24.8

01 General Requirements

	Craft@Hrs	Unit	Material	Labor	Total
Project Financing Construction loans are usually made for a term of up to 18 months. The maximum loan will be based on the value of the land and building when completed. Typically this maximum is 75% for commercial, industrial and apartment buildings and 77.5% for tract housing.					
The initial loan disbursement will be about 50% of the land cost. Periodic disbursements are based on the percentage of completion as verified by voucher or inspection. The last 20% of loan proceeds is disbursed when an occupancy permit is issued. Fund control fees cover the cost of monitoring disbursements. Typical loan fees, loan rates and fund control fees are listed below.					
Loan origination fee, based on amount of loan					
Tracts	—	%	—	—	2.5
Apartments	—	%	—	—	2.0
Commercial, industrial buildings	—	%	—	—	3.0
Loan interest rate, prime rate plus					
Tracts, commercial, industrial	—	%	—	—	2.0
Apartments	—	%	—	—	1.5
Fund control fees (costs per \$1,000 disbursed)					
To \$100,000	—	LS	—	—	800.00
Over \$100,000 to \$300,000, \$800 plus	—	M\$	—	—	3.00
Over \$300,000 to \$500,000, \$1,340 plus	—	M\$	—	—	2.25
Over \$500,000 to \$1,000,000, \$1,790 plus	—	M\$	—	—	2.00
Over \$1,000,000 to \$7,000,000, \$2,795 plus	—	M\$	—	—	.90
Over \$7,000,000, \$8,195 plus	—	M\$	—	—	.75
Project Scheduling by CPM (Critical Path Method). Includes consultation, review of construction documents, development of construction logic, and graphic schedule. Project scheduling software can be purchased for home use. Costs typically will be between \$1,000.00 and \$2,500.00					
Wood frame buildings, one or two stories					
Simple schedule	—	LS	—	—	869.00
Complex schedule	—	LS	—	—	2,090.00
Tilt-up concrete buildings, 10,000 to 50,000 SF					
Simple schedule	—	LS	—	—	1,180.00
Complex schedule	—	LS	—	—	1,780.00
Two to five story buildings (mid rise)					
Simple schedule	—	LS	—	—	2,150.00
Complex schedule	—	LS	—	—	3,050.00
Five to ten story buildings (high rise)					
Simple schedule	—	LS	—	—	3,480.00
Complex schedule	—	LS	—	—	8,740.00
Manufacturing plants and specialized use low rise buildings					
Simple schedule	—	LS	—	—	1,550.00
Complex schedule	—	LS	—	—	2,140.00

Comprehensive schedules to meet government or owner specifications may cost 20% to 40% more. Daily schedule updates can increase costs by 40% to 50%.

Sewer Connection Fees Check with the local sanitation district for actual charges. These costs are typical for work done by city or county crews and include excavation, re-compaction and repairs to the street. Note that these costs are set by local government and will vary widely. These costs do not include capacity fees or other charges which are often levied on connection to new construction. The capacity fee per living unit may be \$3,000 or more. For commercial buildings, figure 20 fixture units equal one living unit. A 6" sewer connection will be required for buildings that include more than 216 fixture units. (Bathtubs, showers and sinks are 2 fixture units, water closets are 4, clothes washers are 3 and lavatories are 1.) The costs shown assume that work will be done by sanitation district crews. Similar work done by a private contractor under a public improvement permit may cost 50% less.

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	Craft@Hrs	Unit	Material	Labor	Total
Typical charges based on main up to 11' deep and lateral up to 5' deep.					
4" connection and 40' run to main in street	—	LS	—	—	1,730.00
4" pipe runs over 40' to street	—	LF	—	—	39.00
6" connection and 40' run to main in street	—	LS	—	—	2,810.00
6" pipe runs over 40' to street	—	LF	—	—	66.60
4" connection and 15' run to main in alley	—	LS	—	—	1,250.00
6" connection and 15' run to main in alley	—	LS	—	—	2,020.00
Manhole cut-in	—	Ea	—	—	343.00
Add for main depths over 5'					
Over 5' to 8'	—	%	—	—	30.0
Over 8' to 11'	—	%	—	—	60.0
Over 11'	—	%	—	—	100.0

Water Meters Check with the local water district for actual charges. These costs are typical for work done by city or county crews and include excavation and pipe to 40' from the main, meter, vault, re-compaction and repairs to the street. These costs do not include capacity fees or other charges which are often levied on connection to new construction. The capacity fee per living unit is typically \$5,000. For commercial buildings, figure 20 fixture units equal one living unit. (Bathtubs, showers and sinks are 2 fixture units, water closets are 4, clothes washers are 3 and lavatories are 1.) The cost for discontinuing service will usually be about the same as the cost for starting new service, but no capacity fee will be charged. Add the backflow device and capacity fee, if required.

1" service, 3/4" meter	—	LS	—	—	2,870.00
1" service, 1" meter	—	LS	—	—	2,960.00
Add for 1" service per LF over 40'	—	LF	—	—	68.40
2" service, 1-1/2" meter	—	LS	—	—	3,310.00
2" service, 2" meter	—	LS	—	—	3,440.00
Add for 2" service per LF over 40'	—	LF	—	—	73.70
Two 2" service lines and meter manifold	—	LS	—	—	5,440.00
Add for two 2" lines per LF over 40'	—	LF	—	—	100.00
Hydrant meter, typical deposit is \$1,000 to \$2,000, typical water cost is \$5 per 1,000 gallons					
Rental per day	—	Day	—	—	12.10
Installation of meter only. Connected to existing water service if correct size line exists from the water main to the meter box location					
3/4" meter	—	LS	—	—	126.00
1" x 3/4" meter	—	LS	—	—	120.00
1" meter	—	LS	—	—	143.00
1-1/2" meter	—	LS	—	—	463.00
2" meter	—	LS	—	—	674.00
2" meter (double line)	—	LS	—	—	1,190.00
Backflow preventer with single check valve. Includes pressure vacuum breaker (PVB), two ball valves, one air inlet and one check valve					
1" pipe	—	LS	—	—	285.00
2" pipe	—	LS	—	—	561.00
Backflow preventer with double check valves. Includes pressure vacuum breaker (PVB), two ball or gate valves, one air inlet and two check valves					
3/4" pipe	—	LS	—	—	373.00
1" pipe	—	LS	—	—	391.00
1-1/2" pipe	—	LS	—	—	457.00
2" pipe	—	LS	—	—	612.00
Reduced pressure backflow preventer. Includes pressure reducing vacuum breaker (PRVB), two ball or gate valves, one air inlet and two check valves and a relief valve					
1" pipe	—	LS	—	—	989.00
2" pipe	—	LS	—	—	1,200.00
Two 2" pipes (double installation)	—	LS	—	—	2,370.00

01 General Requirements

	Craft@Hrs	Unit	Material	Labor	Total
Surveying					
Surveying party, 2 or 3 technicians					
Typical cost	—	Day	—	—	1,270.00
Higher cost	—	Day	—	—	1,630.00
Data reduction and drafting	—	Hr	—	—	77.10
Surveys Including wood hubs or pipe markers as needed. These figures assume that recorded monuments are available adjacent to the site.					
Residential lot, tract work, 4 corners	—	LS	—	—	767.00
Residential lot, individual, 4 corners	—	LS	—	—	1,310.00
Commercial lot, based on 30,000 SF lot	—	LS	—	—	1,410.00
Over 30,000 SF, add per acre	—	Acre	—	—	224.00
Lots without recorded markers cost more, depending on distance to the nearest recorded monument.					
Add up to	—	%	—	—	104.0
Some states require that a corner record be prepared and filed with the county surveyor's office when new monuments are set. The cost of preparing and filing a corner record will be about \$350.00 to \$400.00.					
Aerial Mapping Typical costs based on a scale of 1" to 40'.					
Back up ground survey including flagging model	—	Ea	—	—	3,770.00
(Typical "model" is approximately 750' by 1,260' or 25 acres)					
Aerial photo flight, plane and crew, per local flight. One flight can cover several adjacent models					
Per local flight	—	Ea	—	—	462.00
Vertical photos (2 required per model)	—	Ea	—	—	50.30
Data reduction and drafting, per hour	—	Hr	—	—	70.40
Complete survey with finished drawing, per model, including both field work and flying					
Typical cost per model	—	Ea	—	—	3,870.00
Deduct if ground control is marked on the ground by others					
Per model	—	LS	—	—	-1,000.00
Typical mapping cost per acre including aerial control, flight and compilation					
Based on 25 acre coverage	—	Acre	—	—	181.00
Aerial photos, oblique (minimum 4 per job), one 8" x 10" print					
Black and white	—	Ea	—	—	50.30
Color	—	Ea	—	—	101.00
Quantitative studies for earthmoving operations to evaluate soil quantities moved					
Ground control and one flight	—	Ea	—	—	3,170.00
Each additional flight	—	Ea	—	—	2,160.00
Engineering Fees Typical billing rates.					
Registered engineers (calculations, design and drafting)					
Assistant engineer	—	Hr	—	—	88.60
Senior engineer	—	Hr	—	—	151.00
Principal engineers (cost control, project management, client contact)					
Assistant principal engineer	—	Hr	—	—	159.00
Senior principal engineer	—	Hr	—	—	213.00
Job site engineer (specification compliance)	—	Hr	—	—	88.70
Estimating Cost Compiling detailed labor and material cost estimate for commercial and industrial construction, in percent of job cost. Actual fees are based on time spent plus cost of support services.					
Most types of buildings, typical fees					
Under \$100,000 (range of .75 to 1.5%)	—	%	—	—	1.1
Over \$100,000 to \$500,000 (range of .5 to 1.25%)	—	%	—	—	0.9
Over \$500,000 to \$1,000,000 (range of .5 to 1.0%)	—	%	—	—	0.8
Over \$1,000,000 (range of .25 to .75%)	—	%	—	—	0.5

01 General Requirements

	Craft@Hrs	Unit	Material	Labor	Total
Complex, high-tech, research or manufacturing facilities or other buildings with many unique design features, typical fees					
Under \$100,000 (range of 2.3 to 3%)	—	%	—	—	2.7
Over \$100,000 to \$500,000 (range of 1.5 to 2.5%)	—	%	—	—	2.0
Over \$500,000 to \$1,000,000 (range of 1.0 to 2.0%)	—	%	—	—	1.5
Over \$1,000,000 (range of .5 to 1.0%)	—	%	—	—	0.8
Typical estimator's fee per hour	—	Hr	—	—	45.00
Specifications Fee Preparing detailed construction specifications to meet design requirements for commercial and industrial buildings, in percent of job cost. Actual fees are based on time spent plus cost of support services, if any.					
Typical fees for most jobs	—	%	—	—	0.5
Small or complex jobs					
Typical cost	—	%	—	—	1.0
High cost	—	%	—	—	1.5
Large jobs or repetitive work					
Typical cost	—	%	—	—	0.2
High cost	—	%	—	—	0.5
Job Layout Setting layout stakes for the foundation from monuments identified on the plans and existing on site. Per square foot of building first floor area. Typical costs. Actual costs will be based on the time required.					
Smaller or more complex jobs	—	SF	—	—	.90
Large job, easy work	—	SF	—	—	.57
General Non-Distributable Supervision and Expense					
Project manager, typical	—	Mo	—	—	6,720.00
Job superintendent	—	Mo	—	—	5,210.00
Factory representative	—	Day	—	—	803.00
Timekeeper	—	Mo	—	—	2,160.00
Job site engineer for layout	—	Mo	—	—	4,020.00
Office manager	—	Mo	—	—	2,430.00
Office clerk	—	Mo	—	—	1,790.00
Mobilization Typical costs for mobilization and demobilization within a 50 mile radius as a percent of total contract price. Includes cost of moving general contractor-owned equipment and job office to the site, setting up a fenced material yard, and removing equipment, office and fencing at job completion.					
Allow, as a percentage of total contract price	—	%	—	—	0.5
Aggregate Testing					
Add for sample prep	—	Hr	—	—	50.30
Abrasion, L.A. Rattler, 100/500 cycles, ASTM C 131	—	Ea	—	—	123.00
Absorption, ASTM C 127, 128	—	Ea	—	—	60.90
Acid solubility	—	Ea	—	—	35.60
Aggregate test for mix design, including sieve analysis, specific gravity, number 200 wash,					
organic impurities	—	Ea	—	—	50.30
Clay lumps and friable particles, ASTM C 142	—	Ea	—	—	67.00
Coal and lignite, ASTM C 123	—	Ea	—	—	107.00
Material finer than #200 sieve, ASTM C 117	—	Ea	—	—	41.60
Organic impurities, ASTM C 40	—	Ea	—	—	52.80
Percent crushed particles, CAL 205	—	Ea	—	—	70.00
Percent flat or elongated particles, CRD C 119	—	Ea	—	—	112.00
Potential reactivity, chemical method, 3 determinations per series,					
ASTM C 289	—	Ea	—	—	352.00
Potential reactivity, mortar bar method, ASTM C 227	—	Ea	—	—	335.00

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	Craft@Hrs	Unit	Material	Labor	Total
Sieve analysis, pit run aggregate	—	Ea	—	—	70.00
Lightweight aggregate ASTM C 123	—	Ea	—	—	78.20
Sand equivalent	—	Ea	—	—	89.30
Sieve analysis, processed (each size), ASTM C 136	—	Ea	—	—	81.20
Soft particles, ASTM C 235	—	Ea	—	—	70.00
Soundness, sodium or magnesium, 5 cycle, per series, ASTM C 88	—	Ea	—	—	151.00
Specific gravity, coarse, ASTM C 127	—	Ea	—	—	60.90
Specific gravity, fine, ASTM C 127	—	Ea	—	—	84.20
Unit weight per cubic foot, ASTM C 29	—	Ea	—	—	35.60
Asphaltic Concrete Testing Minimum fee is usually \$40.00.					
Asphaltic concrete core drilling, field or laboratory					
Per linear inch	—	Ea	—	—	5.08
Add for equipment and technician for core drilling	—	Hr	—	—	71.10
Asphaltic core density	—	Ea	—	—	25.40
Extraction, percent asphalt (Method B), excluding ash correction, ASTM D 2172	—	Ea	—	—	60.90
Gradation on extracted sample (including wash), ASTM C 136	—	Ea	—	—	76.20
Maximum density, lab mixed, Marshall, 1559	—	Ea	—	—	178.00
Maximum density, premixed, Marshall, 1559	—	Ea	—	—	127.00
Maximum theoretical unit weight (Rice Gravity), ASTM 2041	—	Ea	—	—	76.20
Penetration, ASTM D 5	—	Ea	—	—	60.90
Stability, lab mixed, Marshall, ASTM D 1559	—	Ea	—	—	254.00
Stability, premixed, Marshall, ASTM D 1559	—	Ea	—	—	153.00
Concrete Testing Minimum fee is usually \$40.00.					
Aggregate tests for concrete mix designs only, including sieve analysis, specific gravity, number 200 wash, organic impurities, weight per cubic foot					
Per aggregate size	—	Ea	—	—	73.10
Amend or re-type existing mix designs					
Not involving calculations	—	Ea	—	—	42.60
Compression test, 2", 4", or 6" cores (excludes sample preparation) ASTM C 42	—	Ea	—	—	37.60
Compression test, 6" x 12" cylinders, including mold ASTM C 39	—	Ea	—	—	13.20
Core cutting in laboratory	—	Ea	—	—	42.60
Cylinder pickup within 40 miles of laboratory					
Cost per cylinder (minimum of 3)	—	Ea	—	—	9.14
Flexure test, 6" x 6" beams, ASTM C 78	—	Ea	—	—	53.80
Laboratory trial, concrete batch, ASTM C 192	—	Ea	—	—	350.00
Length change (3 bars, 4 readings, up to 90 days) ASTM C 157 modified	—	LS	—	—	243.00
Additional readings, per set of 3 bars	—	LS	—	—	37.60
Storage over 90 days, per set of 3 bars, per month	—	Mo	—	—	37.60
Modulus of elasticity test, static, ASTM C 469	—	Ea	—	—	74.10
Mix design, determination of proportions	—	Ea	—	—	80.20
Pick up aggregate sample					
Within 40 mile radius of laboratory, per trip	—	Ea	—	—	47.70
Pickup or delivery of shrinkage molds, per trip	—	Ea	—	—	32.50
Prepare special strength documentation for mix design	—	Ea	—	—	90.30

01 General Requirements

	Craft@Hrs	Unit	Material	Labor	Total
Proportional analysis, cement factor and percent of aggregate					
Per analysis	—	Ea	—	—	233.00
Review mix design prepared by others	—	Ea	—	—	69.00
Splitting tensile, 6" x 12" cylinder, ASTM C 496	—	Ea	—	—	32.50
Weight per cubic foot determination of lightweight concrete cylinders	—	Ea	—	—	6.09
Masonry and Tile Testing					
Brick, ASTM C 67					
Modulus of rupture (flexure) or compressive strength	—	Ea	—	—	27.40
Absorption initial rate, 5 hour or 24 hour	—	Ea	—	—	22.30
Boil, 1, 2, or 5 hours	—	Ea	—	—	22.30
Efflorescence	—	Ea	—	—	27.40
Dimensions, overall, coring, shell and web	—	Ea	—	—	22.30
Compression of core	—	Ea	—	—	37.60
Cores, shear, 6" and 8" diameter, 2 faces, per core	—	Ea	—	—	47.70
Coefficient of friction (slip test)	—	Ea	—	—	85.20
Concrete block, ASTM C 140					
Moisture content as received	—	Ea	—	—	22.30
Absorption	—	Ea	—	—	27.40
Compression	—	Ea	—	—	32.50
Shrinkage, modified British, ASTM C 426	—	Ea	—	—	69.00
Compression, 4", 6", 8" cores	—	Ea	—	—	37.60
Fireproofing, oven dry density	—	Ea	—	—	32.50
Gunitite					
Compression, 2", 4", 6" cores, ASTM C 42	—	Ea	—	—	37.60
Pickup gunitite field sample (40 mile trip maximum)	—	Ea	—	—	53.80
Building stone					
Compression	—	Ea	—	—	32.50
Flex strength	—	Ea	—	—	32.50
Modules/rupture	—	Ea	—	—	32.50
Specific gravity	—	Ea	—	—	32.50
Water absorption	—	Ea	—	—	32.50
Masonry prisms, ASTM E 447					
Compression test, grouted prisms	—	Ea	—	—	138.00
Pickup prisms, within 40 miles of lab	—	Ea	—	—	37.60
Mortar and grout, UBC Standard 24-22 & 24-28					
Compression test, 2" x 4" mortar cylinder	—	Ea	—	—	18.30
Compression test, 3" x 6" grout prisms	—	Ea	—	—	24.30
Compression test, 2" cubes, ASTM C 109	—	Ea	—	—	47.70
Roof fill, lightweight ASTM C 495					
Compression test	—	Ea	—	—	22.30
Density	—	Ea	—	—	16.30
Roofing tile					
Roofing tile breaking strength, UBC	—	Ea	—	—	22.30
Roofing tile absorption	—	Ea	—	—	22.30
Reinforcement Testing					
Sampling at fabricator's plant (within 40 miles of lab), \$50.00 minimum					
During normal business hours, per sample	—	Ea	—	—	18.30
Other than normal business hours, per sample	—	Ea	—	—	27.40
Tensile test, mechanically spliced bar	—	Ea	—	—	102.00
Tensile test, number 11 bar or smaller, ASTM 615	—	Ea	—	—	26.40

steel framing, door opening	65	stairnose	158	vanities	293	Bituminous	
steel framing, window opening	.66	threshold	158	wallboard	168	paving	245, 616
wall	.34	Band moulding	224	Baths, steam	287	paving, removal	.335
wall, brick	.211, 377	Band saws, rental	331	Bathtubs	247, 536, 538	prime coat	.614
Astragal moulding	.109, 225, 417, 425	Bank equipment	456	ADA compliant	248	roofing	258, 405
Astro dial switch	.569	alarm system	456	caulk	.78	Black steel pipe	498
Athletic		camera surveillance	456	doors	274	Blanket insulation	.184
benches	470	Bar		enameled cast iron	247	Blasting	
court, striping	471	doors	118	enameled steel	247	excavation	600
court, surface prep	471	sinks	249	fiberglass	247	sand	375
equipment	470	Barbed wire fence	143	recessed	247	water	.241, 266, 336, 375, 441
equipment, swimming pools	480	Barracks		rough-in	536	Bleachers	468, 478
field marker	220	manufactured	484	seat	.25	Blinds	
fields	469	mining camp	484	walk-in	248	roll-up	299
gym equipment	468	Barricade		whirlpool tub	247	Venetian	299
ATM machine	457	highway	620	Battens, lumber	224	vertical	299
Attachments, crane, rental	325	lights	.22	Batts, insulation	.181, 401	Block	
Attic		rental	.22	Bay vent channel	295	adobe	218
access doors	269	roadway	.22	Bay window	301	concrete	215, 381
fans	128	temporary enclosures	334	roof cover	306	core fill	215, 381
fans, belt drive	141	Barrier, egress	491	Bead		demolition	.339
gable vents	141	Barrier posts	456	lath	429	detailed concrete	.215, 381
stairs, folding	287	Barrier tapes	321	lath & plaster	189	filler, acrylic	239
vents	294	Bars		moulding	225, 228	flooring	158
Audio		bath accessories	.24	Beadex	169	frieze	394
detectors	267	masonry	.349, 375	Beam clamps, piping	521	glass building	219
sensors	594	reinforcing steel	.89, 349	Beams		masonry	215, 381
Audio-visual equipment, school	462	welding	352	applied	.54	painting	242, 441
Auditorium		Base		carpentry	393	pier	.39
acoustic design fees	134	asphalt	245	ceiling	.45	sawing	373
seating	478	ceramic tile	.293, 377, 431	clamps, conduit	560	walls, concrete	215
Auger holes		column	391	collar	.48	Block filler, painting	441
caissons	.613	course, paving	245	concrete	343, 348	Blocking	
post holes	622	floor	154	formwork	343, 348	carpentry	393
Augers		hardwood	224	grade	.93	finish carpentry	.51
rental	330	marble	385	laminated timbers	399	fireblocks	.45
toilet, rental	331	MDF	228	log	194	sheathing	395
Auto hoist	454	post	163	lumber	202	steel floor joists	.61
Automatic gates	166	resilient flooring	154	LVL	400	Blockout forms	
Awning windows		screed	189, 430	precast	362	cast-in-place slabs	344
aluminum	305	sheet, fiberglass	260	ridge	194	tilt-up	364
vinyl-clad wood	303	slab	.94	shoring	348	Blockouts, concrete	345
Awnings	.21	Base wages		steel	386	Blood storage refrigerators	474
canopy-type	476	industrial & commercial	312	steel collar	.72	Blowers	
commercial	475	residential	.10	Bearing capacity test	282	exhaust hood	459
fabric	.21	Baseball backstops	623	Bearing ratio, soil testing	320	fans	142
lean-to type	476	Baseboard	.55	Bed bumpers	448	fireplace	152
motorized	476	bamboo	158	Bed moulding	226, 228	heating	540
security	.21	MDF	228	Beds		Blown-in insulation	184, 402
B							
Baby changing stations	451	Baseboard heating		concealed	.25	Blue Board insulation	182
Backbar	461	electric	541	folding	.25	Bluegrass seeding	629
Backboard, plywood	464	radiation	543	Beehive climber	471	Blueprinting	.25
Backer board		radiators	176	Beehive grate	642	Board	
gypsum drywall	168	Basement		Bell footings	613	insulation	181
tile	293	doors	.23	Bell wire	104	sheathing	51
Backer rod	617	stairs	284	Bell wiring, electrical work	128	Boards	
Backer strip, steel framing	.69	storm window	307	Bellows, pipe	527	forming	.88
Backfill		window	304	Bells		lumber	195, 197-199
concrete excavation	342	Basic wage cost	.3	door	104	sheathing	.61
earthwork	136	Basketweave fence	147	fire alarm	596	treatment	208
tilt-up	365	Bath accessories	448	Belt conveyors	495	Bobcats, rental	326
trench	603, 624	ceramic	290	Benches		Boilermaker, wage	312
Backflow		ceramic tile	292	athletic	470	Boilers	583
preventers	526, 624, 632	compartments	446, 538	bus stop	483	expansion tank	174
valves	315	doors	274	church	464	foundations	370
Backhoes		enclosures	275	locker room	478	modules	583
excavation	137, 604	fans	142	park	478	Bollards	
rental	138, 325	shower and tub doors	274	stadium	478	bicycle	479
trenching	602	shower cabinets	538	Benderboard	188	cast iron	620
Backing		vanities	293	Benefits, fringe	312	granite	621
carpentry	.47	Bath exhaust fan	139-140	Bentonite		Boit cutters, rental	331
clay tile	377	accessories	141	granules	358	Bolts	
finish carpentry	.51	ceiling blower	139	waterproofing	296	anchor	.58
rods	415	Exhaust Air	140	Berber carpet	.76	carriage	234
steel framing	.69	Heat-A-Lamp	141	Bevel siding	200	foundation	159
Backsplash	.96	heater, ceiling	141	Beveled glass doors	107	lag	234
Backstops, baseball	623	Quiet Test	140	Beverage dispenser	462	machine	234
Balance beams	471	switch	141	Bicycle racks	479	tilt-up	364
Balancing valves	174, 544	timer switch	141	Bidets	249	Bond breaker	358
Ball cleaning sewer mains	636	Value Test	140	Bi-fold doors	124-125	tilt-up	367
Ball joint, pipe	527	vent kit	141	hardware	125	Bonding agents	
Ball valves	527	with heater	141	mirrored	125	adhesives	17, 18
Ballista range hood	257	with heater, infrared	140	Bike post bollard	479	flooring	154
Balusters	285	with light	140	Bin, trash	335	roofing	259, 406
painting	242, 442	Bath fixtures	536, 538	Birch		Bonds, insurance	185
Bamboo		Bathroom		doors	106, 115-116, 119	Bookcases, painting	243
baseboard	158	accessories	.23	paneling	244	Boomlifts, rental	327
flooring	157	cabinets	293	plywood	205	Boring	
		fan wiring	128	Bird screen	410	caissons	.613
		fans	139-141	Birdstop	265	soil testing	282
		sinks	249, 538	Bitumen adhesive, modified	260	under walkways	624

shakes	262	Changes in costs	5	Cleaning	Colonial
shingles	258	Changing stations	451	brick	brick
siding	200	Channel		cabinets	columns
Cedarmill	277	hanger	560	concrete	interior doors
Ceiling		resilient	169, 428	doors	storm doors
access hatches	410	siding	200	final	Color coat, tennis court
adhesive	17	steel	217	floors	Coloring agents
assemblies, wood framed	36	strap	560	glass	concrete
beams	45	vent, rafter bay	295	glass block	mortar
beams, carpentry	393	Channelizing, earthwork	607	masonry	220, 617
demolition	100	Charbroiler, commercial	459	new construction	Column forms
domes	79	Charging, electric fence	143	paint preparation	capitals
fans	142	Check desks	456	paving	round
fans, bath	139	Check valves	496, 523, 525	painting	tilt-up
grid	433	Checkroom equipment	457	pavement joints	Columns
joists	46, 67	Chemical fire protection	459	plumbing fixtures	base ties
joists, steel	67, 73	Chemical-resistant brick	378	sewer main	bases
lighting fixtures	79, 190	Cherry		shower stalls	capitals, formwork
metal pans	82	paneling	244	stone	caps
paint removal	235	parquet	158	terra cotta	carpentry
painting	240, 243, 441	Chestnut flooring	155-156	vacuum systems	carpentry, steel
panels	81	Child protection seat	451	walls	clamps, rental
radiant heating systems	176	Chilled water pipe	498	windows	concrete
skylights	280	Chimes, door	104	Cleaning station	fireproofing
tile	82, 433	wiring	128	Cleanout	footings
tile adhesive	433	Chimneys		adapter, ABS	lally
tile, wood fiber	433	anchors	151	doors, fireplace	lally, steel
treatments	54	caps	294	drainage piping	marble
Ceilings		firebrick	214	plug, ABS-DWV	painting
acoustical	432	fireplace	152	tees, ABS	porch
plywood	54	flashing	407	Cleanup, overhead	precast
stained glass look	81	flues	152, 218, 377	Clear cedar siding	reinforcing
suspended	79, 433	masonry	221, 377	Clearing	structural steel
tin	82	prefabricated	377	brush	tilt-up
wood strip	54	Chippers		excavation	tube
Cellar doors, steel	109	pneumatic, rental	323	Clerical help cost	wood
Cellulose insulation	184-185	rental	330	Clevis hangers	Come-a-longs, rental
Cement	82	Chisels, rental	323	Climber, tower	Commercial, wage rates
adhesive	17	Chop saws, rental	331	Clips	Commercial brick
cold process	260	Church		angle	Common brick
coloring	85, 220, 359	acoustical design fees	134	framing	Communications
concrete	354	chairs	465	plywood	Communications cable
cutting	373	equipment	464	Clock	Communior rail
duct, envelopes	547	glass	475	receptacles	Compacting soil
fireproofing	411	pews	465	wiring	embankment
lap roof	260	Chutes		Closers, door	equipment rental
painting	242	demolition	340	Closet doors	excavation
pargeting	386	garbage	495	bi-fold	136, 601
plaster	246	linen	495	bypass	roadway
roofing	259	mail	451	mirrored bypass	trenches
testing	318	trash	340	Closet flange, ABS	603
tile	264	Cigarette disposal	478	Closets	Compaction testing
white	82, 430, 437	Cinder rock	609	cabinets	282
Cement and EPS forms	87	Circline lighting	192	lighting, wiring	Compactors, rental
Cement mason, wage		Circuit balancing valves	174, 544	lining, cedar	139, 324
industrial & commercial	312	Circuit breakers		poles	Compartments, cubicles
residential	10	panels	580	racks	Composite lumber
Cementitious		wiring for	128	shelves	98
coating	373	Circuits		storage unit	Composition
decks	372	dryer	548	water	roof, coating for
roofing system	406	exit light	547	Clothes chutes	roofing
Central		light and power	547	Clothes dryers	Compressors
air filter	177, 181	motor	571	vent sets	foundations
heating and cooling	175	range	548	wiring	paint
vacuum systems	293	receptacle	548	Clothes washers, wiring	rental
Ceramic tile	290, 431	switch	547	Clothesline units	service station
backer board	293	under slab	547	Coat hooks and racks	453
demolition	101-102, 340	Circular louver	295	Coatings	Computer
facing tile	378	Circular windows	302	cementious	floor
fixtures	290	City cost adjustments	12-15	concrete finishes	network
installation	292	Civil engineering fees	134	deck	network cable
mosaic	290	Cladding, preformed	404	industrial	wiring
vener	384	Clamps		roofing	130, 463
CertainTeed	261	column forms	358	steel	Concrete
CFL light bulb	193	concrete, rental	325	Coaxial cable	342
Chain hoists, rental	332	conduit	560	Code caps	access ramps
Chain link fence	142, 622	ground rod	571	Coffee brewer/percolator	additives
demolition	336	pipe	521-522	Coil nails	85, 353, 358-359
painting	440	PVC conduit	556	framing	adhesive
Chain railing	390	riser	521	roofing	18
Chain saws	139	top beam	521	Cold box, insulation	aggregate
rental	331	Clamshell excavators, rental	325	Cold milling, asphalt	353
Chair rail	55, 225	Clamshovels, rental	330	Cold process cement	apron
MDF	228	Classrooms, manufactured	484	Cold-formed steel framing	480, 619
Chairs		Clay		Collar beams	architectural
auditorium	478	backing tile	377	carpentry	85
cathedral	465	brick	377	steel framing	beams
reinforcing steel	90	pipe	640	Collar ties	343, 348
school	462	tile, load bearing	377	Collated brads	block core fill
Chamfer		Clean metal primer	238	Collated nails	215, 381
corner forms	358				buggies, rental
strip	358				building walls

CSI		railing	99	Dispensers		painting, interior	243
Division 01	313	redwood	98	beverage	462	peep sights	171
Division 02	335	roof	50, 98, 388	Capuccino	462	protectors	448
Division 03	342	stain	238	cash	457	pulls	171
Division 04	374, 377	stairs	99	gasoline	453	push plates	171
Division 05	386	waterproofing	297	paper towel	448	rehang	52
Division 06	392	yard and patio	99	ticket	454	removal	101, 340
Division 07	401	Decontamination		toilet paper	449	repair	52
Division 08	416	lead-based paint	235, 439	Dispenser, rain gutters	410	sealant	78
Division 09	427	PCBs	439	Display case, food	458	seals, loading dock	456
Division 11	453	radioactivity	439	Display panel for map, schedule	484	seals, weatherstrip	297
Division 12	475	toxic chemicals	439	Disposal		security switch	594
Division 13	480	Decora glass block	219	asbestos	341	shim	52
Division 14	492	Decorative glass, ecclesiastical	475	fields	268	shoe	289
Division 21	495	Deflect-O	141	waste	335	sidelites	110
Division 22	498	Dehumidifiers, rental	332	Disposers, garbage		sill, oak	289
Division 23	540	Deli case, food service	458	commercial	462	stop	171, 424
Division 26	546	Delivery expense defined	3	residential	128, 250	stop moulding	53
Division 27	594	Delivery, office trailers	334	Dispute resolution	20	thresholds	224, 288, 425
Division 31	599	Delphi glass block	219	Distillation, water	252	trim	224, 422
Division 32	614	Deluge valves	496	Distribution, electric	581	twin door portal	489
Division 33	631	Demobilization	317	overhead	581	weatherstripping	297, 425
Cubicles	446	Demolition	100, 338	panels	575, 577	Doorbell, wiring	104
Culvert pipe	636, 638	asbestos	341	switchboards	575	Doors	
Cup holder	23	asphalt	102	Ditch Witch	603	4-panel	106
Cupboards, painting	243	building	104, 338	Ditching	136, 602	6-panel	106
Cupolas		ceiling	100	Ditra membrane	95	access	255, 269, 422, 529
aluminum roof	97	concrete	100	Divider strips, terrazzo	437	accordion	447
cedar	97	concrete block	100	Dividers		air curtain	421
copper roof	97	curb	101, 481	partition	447	aluminum, patio	120-121
weather vanes	97	doors	101	redwood	620	automatic	483
Curbing machine rental	328	fence	336	Docks, loading	357	bar	118
Curbs		flooring	101	bumpers	368	basement	23
asphalt	614	guardrail	336	equipment	455	bathtub	274
concrete	88, 95, 619	joists	103	levelers	368, 455	beveled glass	107
demolition	101, 335	manholes	337	lifts	455	bi-fold	124-125
elevated slabs	349	masonry	100	seals	455	birch	106, 119
for handicapped	482	plumbing fixtures	482	shelters	456	birch, prehung	110
granite	618	roof	339	Documentation, photographs	321	bypass	123-124
inlets	643	roofing	102	Dolly, rental	332	café	118
Curing concrete	359, 365	sheathing and siding	102	Domes		camber top	112
Curing papers	27-28	stairs	103	lighted ceilings	79	cellar	109
Curtain rods		subcontract	104	playground	471	cleanout, fireplace	151
drapery hardware	127	toilet partitions	482	skylights	280	closet	119, 123-124
shower	24	walls	103, 338	Door		closet, installation	52
Curtain wall	422	windows	102	accessories, bypass	124	convenience store	489
Curtains		wood framing	103	bells, wiring	128	crossbuck	106
industrial and commercial	475	Demountable partitions	447	bottom	289	depository	456
lift equipment	467	Dens Glass sheathing	183	casing	53, 108	Dutch	448
residential	127	Deposit boxes	456	casing, ranch	108	entrance	107
stage	466	Depository doors, after hours	456	chimes	104	entry	106-107, 111-112
Cut and fill excavation	607	Desalination, water	252	cleaning	83	entry, steel	112
Cutting		Desks		closers	105	exterior	105-106, 110
asphalt	374	bank	456	closers, hinge pin	105	exterior, fire-rated	109
boards	458	study	463	coverings	277	exterior, steel	109-111
brick	373	Detailed block	215	demolition	101, 338	fiberglass	112-113, 419
concrete	373	Detection systems	596	finish carpentry	52	fir	107
masonry	373	Detectors		flexible strip	422	fire	419
slabs	374	audio	267	frame protectors	448	fire-rated	109
steel	391	fire	267	frames	109	flush closet	124
walls	373	infrared	267	frames, fire-rated	109	flush exterior	106
Cypress flooring	156	security	596	frames, metal	391, 418	flush interior	116
		smoke	267	frames, painting	242	folding	122
D		vehicle	454	frames, pocket	171	folding, installation	52
Dampers, air regulating, fireplace	151	Detour signs, barricade	22	frames, steel	109	foundation access	295
Dampproofing	401	Dewatering	607	framing	43	frames, wood	419
Danger signs	321	Diamond lath	188	framing, steel	65	French	107
Danish oil stain	239	Diaphragm meter	644	handle sets	170	French, interior	117
Deadbolt locks		Diffusers, light	587	hangers	172	garage	165
commercial	423-424	Digging		hangers, pocket	172	handicapped	483
residential	170-171	concrete work	342	hardware	53, 125, 425	handicapped, automatic	483
Debris removal	313, 335, 340	excavation	136	hardware kit	172	hangar	420
Decks	98	post holes	144	hardware, exit	172	hanging	52
cementitious	372	Digital		hardware, garage	166, 173	hardboard	118
composite lumber	98	networking systems	131	hardware, threshold	288-289	hardboard exterior	105
concrete	312	photography	321	hinges	424	hemlock	110
covers	98	Digital recorder	597	jamb, exterior	108	hollow metal	416
diagonal pattern	98	Dimension lumber	195, 202	jamb, interior	118	interior fire-rated	109
fiber	372	Dimmer switches	129, 569	kick plates	171	interior, café	118
finish room	99	Direct overhead	313	knockers	171	interior, French	117, 120
flashing	271, 273	Directory boards	444-445	lever latchset	171	interior, hollow core	116
flashing, Vycor	27	Dirt, recycling	335	lever, privacy	171	interior, louver	117, 120
footings	99	Disabled, access for	480	locks	122	interior, panel	116-117, 119-120
handrail	99	Disappearing stairs	287	locksets	170	interior, prehung	118-119
metal	388	Disconnect switches	582	louvers	421	interior, slab	115
metal, demolition	339	Dishwashers		mantels	298	interior, solid core	116
nails	230	commercial	462	mirrors	223	lauan	118
painting	440-442	electrical	251	openers	164	metal, reversible	109
pine	98	plumbing	251	openings, framing	43	mirrored	125
posts	99	residential	251	openings, steel framing	65	molded face	116-117
pressure treated	98	return panels	31	paint removal	235	oak	106, 119
		wiring	128	painting, exterior	242	overhead	165, 419, 487

overhead roll-up	420	fittings	126	vinyl clad	427	Electrical	546
partition	446	fittings, corrugated	637	wallboard	296	alarm systems	128, 267
patio, sliding	121	Hi-Q	636	wallboard assemblies	34	boxes	547
patio, swinging	120-122	plastic	126, 516	Drywall installer, wage		boxes, outlet	566
pet	122	poly	635	industrial & commercial	312	building wire	563
pocket	171	Drainage		residential	10	cable tray	562
pocket, installation	52	fabric	608	Drywall taper, wage, residential	10	circuit breakers	572
prehung, exterior	110	pipe	126, 636	Duct		conduit	548
prehung, interior	118-120	slope protection	608	cable tray	562	cover plate	570
prehung, steel	418	Drainage systems		electrical	561	cutouts	582
prehung, wood	419	rock and sand fill	126	fiberglass	178	device boxes	561
radiation shielding	488	tile	639	flex	178	distribution	581
refrigerator	420	Drainboards, countertops	293	painting	440	duct, concrete	547
revolving	420	laminated plastic	477	sheet metal	178	duct, surface	561
screen, patio	121	stainless steel	461	underfloor	562	fence, charging unit	143
screen, security	113	tile	437	underground	547	fuses	580
screen, vinyl	113	Drains		Ductile iron pipe	633	generators	131, 582
screen, wood	113	area	530	Ducting	256	generators, rental	329
screen, metal	113	fiberglass	640	Ductwork, painting	440	ground wire	563
security	115	floor	520, 530	Dumbwaiters	133, 492	grounding	571
security grills	420	foundation footing	126	Dummy knobs	424	handy box	567
service	420	gratings	390	Dump fees	335	heater	176
shower	274	pipng	126	Dump trucks		heating	541
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