



2013 NATIONAL CONSTRUCTION ESTIMATOR

61st Edition

Edited by Richard Pray



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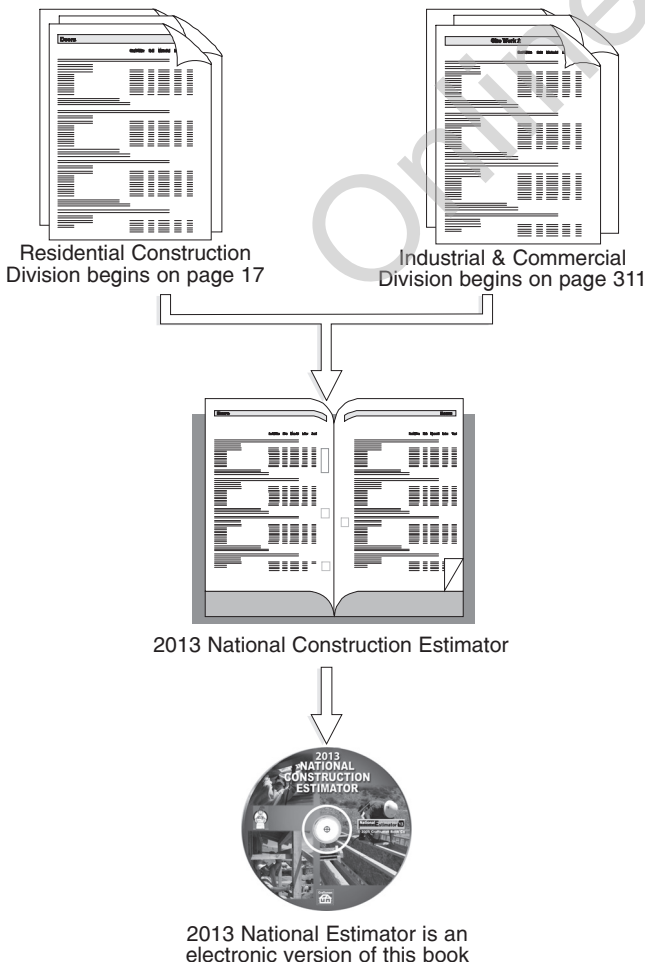
This Book Is an Encyclopedia of 2013 Building Costs

The **2013 National Construction Estimator** lists estimated construction costs to general contractors performing the work with their own crews, as of mid-2013. 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) is an electronic version of this book. To watch a short video guide to National Estimator, click “Help” on the menu bar. Then click “Launch The Tutorial.”



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-2013. Discounts may be available for purchases in larger volume.

Quarterly prices updates on the Web are free and automatic all during 2013. 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. These costs were compiled in the fall of 2012 and projected to mid-2013 by adding 3% to 6%. This estimate will be accurate for some materials but inaccurate for others. No one can predict material price changes accurately.

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		
F	Fahrenheit	NEMA	National Electrical Manufacturer's Association		
		NFPA	National Fire Protection Association		
		No.	number		
		NRC	noise reduction coefficient		

Symbols

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

Craft Codes, Hourly Costs and Crew Compositions

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

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

For example, on page 51 you'll find estimates for installing BC plywood wall sheathing by the square foot. The *Craft@Hrs* column opposite 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 \$32.53. That's the average for a residential laborer (listed at \$29.05 per hour on page 10) and a Residential carpenter (listed at \$36.01 per hour): \$29.05 plus \$36.01 is \$65.06. Divide by 2 to get \$32.53, 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 \$32.53, 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	\$32.53	1 laborer and 1 carpenter	BR	\$34.90	1 lather
B2	\$33.69	1 laborer, 2 carpenters	BS	\$31.36	1 marble setter
B3	\$31.37	2 laborers, 1 carpenter	CF	\$33.86	1 cement mason
B4	\$34.84	1 laborer 1 operating engineer 1 reinforcing iron worker	CT	\$33.77	1 mosaic & terrazzo worker
B5	\$34.88	1 laborer, 1 carpenter 1 cement mason 1 operating engineer 1 reinforcing iron worker	D1	\$34.97	1 drywall installer 1 drywall taper
B6	\$31.46	1 laborer, 1 cement mason	DI	\$34.64	1 drywall installer
B7	\$29.39	1 laborer, 1 truck driver	DT	\$35.30	1 drywall taper
B8	\$34.90	1 laborer 1 operating engineer	HC	\$27.98	1 plasterer helper
B9	\$31.95	1 bricklayer 1 bricklayer's helper	OE	\$40.74	1 operating engineer
BB	\$36.80	1 bricklayer	P1	\$35.16	1 laborer, 1 plumber
BC	\$36.01	1 carpenter	PM	\$41.27	1 plumber
BE	\$39.05	1 electrician	PP	\$32.91	1 painter, 1 laborer
BF	\$32.73	1 floor layer	PR	\$36.41	1 plasterer
BG	\$33.97	1 glazier	PT	\$36.77	1 painter
BH	\$27.09	1 bricklayer's helper	R1	\$34.74	1 roofer, 1 laborer
BL	\$29.05	1 laborer	RI	\$34.72	1 reinforcing iron worker
			RR	\$40.43	1 roofer
			SW	\$40.43	1 sheet metal worker
			T1	\$31.35	1 tile layer, 1 laborer
			TL	\$33.64	1 tile layer
			TR	\$29.73	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	\$46.63	2 carpenters, 2 laborers 1 tractor operator
AT	\$41.65	1 air tool operator	F7	\$48.536	2 carpenters, 1 laborer 1 tractor operator
AW	\$58.09	1 asbestos worker	F8	\$49.47	2 plasterers 1 plasterer's helper
BM	\$58.46	1 boilermaker	F9	\$43.84	1 laborer, 1 floor layer
BT	\$39.49	1 bricklayer tender	FL	\$48.61	1 floor layer
C1	\$39.93	4 laborers, 1 truck driver	G1	\$45.36	1 glazier, 1 laborer
C2	\$46.82	1 laborer, 2 truck drivers 2 tractor operators	H1	\$51.55	1 carpenter, 1 laborer 1 iron worker (structural) 1 tractor operator
C3	\$45.53	1 laborer, 1 truck driver 1 tractor operator	H2	\$48.87	1 crane operator 1 truck driver
C4	\$40.51	2 laborers, 1 truck driver	H3	\$44.23	1 carpenter, 3 laborers 1 crane operator 1 truck driver
C5	\$43.91	2 laborers, 1 truck driver 1 tractor operator	H4	\$59.13	1 crane operator 6 iron workers (structural) 1 truck driver
C6	\$42.94	6 laborers, 2 truck drivers 2 tractor operators	H5	\$51.51	1 crane operator 2 iron workers (structural) 2 laborers
C7	\$45.26	2 laborers , 3 truck drivers 1 crane operator 1 tractor operator	H6	\$50.81	1 iron worker (structural) 1 laborer
C8	\$44.77	1 laborer, 1 carpenter	H7	\$59.81	1 crane operator 2 iron workers (structural)
C9	\$46.69	1 laborer, 1 crane operator	H8	\$57.99	1 crane operator 4 iron workers (structural) 1 truck driver
CB	\$51.90	1 bricklayer	H9	\$57.59	1 electrician 1 sheet metal worker
CC	\$50.47	1 carpenter	IW	\$62.55	1 iron worker (structural)
CD	\$49.25	1 drywall Installer	LA	\$46.13	1 lather
CE	\$57.60	1 electrician	M1	\$45.70	1 bricklayer 1 bricklayer's tender
CG	\$51.65	1 glazier	M2	\$42.86	1 carpenter, 2 laborers
CL	\$39.069	1 laborer	M3	\$47.78	1 plasterer 1 plasterer's helper
CM	\$48.48	1 cement mason	M4	\$44.87	1 laborer, 1 marble setter
CO	\$54.32	1 crane operator	M5	\$48.90	1 pipefitter, 1 laborer,
CV	\$53.93	1 elevator constructor	M6	\$51.96	1 asbestos worker 1 laborer, 1 pipefitter
D2	\$44.16	1 drywall installer 1 laborer	M8	\$53.81	3 pipefitters, 1 laborer
D3	\$50.97	1 laborer, 1 iron worker (structural), 1 millwright	M9	\$58.17	1 electrician, 1 pipefitter
D4	\$45.18	1 laborer, 1 millwright	MI	\$52.17	2 pipefitters, 1 laborer
D5	\$48.76	1 boilermaker, 1 laborer	MS	\$50.67	marble setter
D6	\$52.23	2 millwrights 1 tractor operator	MT	\$48.42	mosaic & terrazzo worker
D7	\$44.90	1 painter, 1 laborer	MW	\$51.29	millwright
D9	\$47.21	2 millwrights, 1 laborer			
E1	\$49.49	2 electricians, 2 laborers 1 tractor operator			
E2	\$48.33	2 electricians, 2 laborers			
E3	\$49.04	2 electricians, 2 laborers 2 carpenters			
E4	\$48.33	1 electrician, 1 laborer			
F5	\$45.91	3 carpenters, 2 laborers			

Commercial and Industrial Division

Craft Code	Cost Per Manhour	Crew Composition	Craft Code	Cost Per Manhour	Crew Composition
P5	\$42.94	3 laborers 1 tractor operator 1 truck driver	S8	\$47.86	2 pile drivers, 2 laborers 1 truck driver 1 crane operator 1 tractor operator
P6	\$49.39	1 laborer, 1 plumber	S9	\$45.63	1 pile driver, 2 laborers 1 tractor operator 1 truck driver
P8	\$43.77	1 laborer, 1 cement mason			
P9	\$46.00	1 carpenter, 1 laborer 1 cement mason			
PA	\$50.74	1 painter	SM	\$57.58	1 sheet metal worker
PD	\$52.51	1 pile driver	SP	\$60.93	1 sprinkler fitter
PF	\$58.73	1 pipefitter	SS	\$49.09	1 laborer 2 tractor operators
PH	\$42.70	1 plasterer's helper			
PL	\$59.72	1 plumber	T2	\$50.36	3 laborers, 3 carpenters 3 iron workers (structural) 1 crane operator 1 truck driver
PS	\$52.85	1 plasterer			
R3	\$44.58	2 roofers, 1 laborer			
RB	\$56.93	1 reinforcing iron worker	T3	\$48.00	1 laborer 1 reinforcing iron worker
RF	\$47.34	1 roofer			
S1	\$46.59	1 laborer 1 tractor operator	T4	\$43.74	1 laborer, 1 mosaic worker
S3	\$48.77	1 truck driver 1 tractor operator	T5	\$48.32	1 sheet metal worker 1 laborer
S4	\$39.06	3 laborers	T6	\$51.41	2 sheet metal workers 1 laborer
S5	\$41.86	5 laborers 1 crane operator 1 truck driver	TD	\$43.42	1 truck driver
S6	\$44.08	2 laborers 1 tractor operator	TO	\$54.11	1 tractor operator
S7	\$46.59	3 laborers 3 tractor operators	U1	\$47.99	1 plumber, 2 laborers 1 tractor operator
			U2	\$45.95	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	\$26.94	\$1.39	25.54%	\$7.24	\$1.23	\$36.80
Bricklayer's Helper	19.84	1.02	25.54	5.33	0.90	27.09
Building Laborer	20.12	1.04	32.93	6.97	0.92	29.05
Carpenter	25.15	1.30	31.83	8.42	1.14	36.01
Cement Mason	25.22	1.30	23.35	6.19	1.15	33.86
Drywall installer	25.72	1.32	23.77	6.43	1.17	34.64
Drywall Taper	26.21	1.35	23.77	6.55	1.19	35.30
Electrician	29.86	1.54	20.04	6.29	1.36	39.05
Floor Layer	24.25	1.25	24.02	6.13	1.10	32.73
Glazier	24.79	1.28	25.98	6.77	1.13	33.97
Lather	26.38	1.36	21.48	5.96	1.20	34.90
Marble Setter	23.69	1.22	21.56	5.37	1.08	31.36
Millwright	25.58	1.32	21.44	5.77	1.16	33.83
Mosaic & Terrazzo Worker	25.52	1.31	21.56	5.78	1.16	33.77
Operating Engineer	29.86	1.54	25.42	7.98	1.36	40.74
Painter	27.02	1.39	25.08	7.13	1.23	36.77
Plasterer	26.02	1.34	28.78	7.87	1.18	36.41
Plasterer Helper	19.99	1.03	28.78	6.05	0.91	27.98
Plumber	30.47	1.57	24.47	7.84	1.39	41.27
Reinforcing Ironworker	24.80	1.28	28.81	7.51	1.13	34.72
Roofer	25.86	1.33	44.34	12.06	1.18	40.43
Sheet Metal Worker	29.45	1.52	26.21	8.12	1.34	40.43
Sprinkler Fitter	29.93	1.54	25.28	7.96	1.36	40.79
Tile Layer	25.41	1.31	21.56	5.76	1.16	33.64
Truck Driver	21.63	1.11	26.42	6.01	.98	29.73

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 2013.

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 311.

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 31.83%, the rate for carpenters in column 3 on page 10. To increase the annual taxable wage by 31.83%, we'll multiply by 1.3183:

$$\begin{array}{r} \$20,800 \text{ per year} \\ \times 1.3183 \text{ tax \& insurance rate} \\ \hline \$27,421 \text{ annual cost} \end{array}$$

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.

$$\begin{array}{r} \$4,124 \text{ medical plan} \\ + 27,421 \text{ annual cost} \\ \hline \$31,545 \text{ total annual cost} \end{array}$$

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:

$$\frac{\$31,545}{2,000} = \$15.77 \text{ per hour}$$

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 \$36.01.

$$\frac{\$15.77}{\$36.01} = .44$$

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 \$10.00 per each bar. If installed by your carpenter working at \$10.00 per hour, your estimated cost would be 44% of \$10.00 or \$4.40. The manhours would remain the same @.280, assuming normal productivity.

If the Labor Rate Is Unknown

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

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

Area Modification Factors

Construction costs are higher in some areas than in other areas. Add or deduct the percentages shown on the following pages to adapt the costs in this book to your job site. Adjust your cost estimate by the appropriate percentages in this table to find the estimated cost for the site selected. Where 0% is shown, it means no modification is required.

Modification factors are listed alphabetically by state and province. Areas within each state are listed alphabetically. For convenience, one representative city is identified in each three-digit zip or range of zips. Percentages are based on the average of all data points in the table. Factors listed for each state and province are the average of all data points in that state

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

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

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

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.												
Alabama Average						Alaska Average						Arizona Average																	
Anniston	362	-3	-17	-1	-9%	Anchorage	995	16	36	5	25%	Chambers	865	1	-12	0	-5%	Batesville	725	0	-23	0	-11%	Alhambra	917-918	3	14	1	8%
Auburn	368	0	-14	0	-6%	Fairbanks	997	16	32	5	23%	Douglas	855	0	-15	0	-7%	Camden	717	-4	-8	-1	-6%	Bakersfield	932-933	0	4	0	2%
Bellamy	369	-2	-6	-1	-4%	Juneau	998	17	25	6	21%	Flagstaff	860	2	-21	1	-9%	Fayetteville	727	1	-9	0	-4%	El Centro	922	1	0	0	1%
Birmingham	350-352	-3	10	-1	3%	Ketchikan	999	3	14	1	8%	Kingman	864	1	-12	0	-5%	Fort Smith	729	-1	-12	0	-6%	Eureka	955	1	-4	0	-1%
Dothan	363	-1	-8	0	-4%	King Salmon	996	16	30	5	22%	Mesa	852	1	0	0	1%	Harrison	726	0	-31	0	-14%	Fresno	936-938	0	-3	0	-1%
Evergreen	364	-1	-26	0	-12%	Arkansas Average						California Average																	
Gadsden	359	-4	-21	-1	-12%	Batesville	725	0	-23	0	-11%	Alhambra	917-918	3	14	1	8%												
Huntsville	358	1	-9	0	-4%	Camden	717	-4	-8	-1	-6%	Bakersfield	932-933	0	4	0	2%												
Jasper	355	-1	-21	0	-10%	Fayetteville	727	1	-9	0	-4%	El Centro	922	1	0	0	1%												
Mobile	365-366	-1	-4	0	-2%	Fort Smith	729	-1	-12	0	-6%	Eureka	955	1	-4	0	-1%												
Montgomery	360-361	-1	-8	0	-4%	Harrison	726	0	-31	0	-14%	Fresno	936-938	0	-3	0	-1%												
Scottsboro	357	0	-15	0	-7%	Hope	718	-3	7	-1	2%	Herlong	961	2	-3	1	0%												
Selma	367	-1	-10	0	-5%	Hot Springs	719	-2	-29	-1	-14%	Inglewood	902-905	3	15	1	8%												
Sheffield	356	0	-2	0	-1%	Jonesboro	724	-1	-17	0	-8%	Irvine	926-927	3	21	1	11%												
Tuscaloosa	354	1	-10	0	-4%	Little Rock	720-722	-1	-6	0	-3%	Colorado Average						Connecticut Average											
Alabama Average						Alaska Average						Arizona Average																	
Lompoc	934	3	10	1	6%	San Bernardino	923-924	0	5	0	2%	Aurora	800-801	2	6	1	4%	Bridgeport	66	1	21	0	10%						
Long Beach	907-908	3	16	1	9%	San Diego	919-921	3	15	1	8%	Boulder	803-804	3	-1	1	1%	Bristol	60	1	25	0	12%						
Los Angeles	900-901	3	13	1	8%	San Francisco	941	3	58	1	28%	Colorado Springs	808-809	2	-6	1	-2%	Fairfield	64	2	24	1	12%						
Marysville	959	1	0	0	1%	San Jose	901-951	3	35	1	18%	Denver	802	2	11	1	6%	Hartford	61	0	22	0	10%						
Modesto	953	1	-3	0	-1%	San Mateo	943-944	4	34	1	18%	Durango	813	1	-5	0	-2%	New Haven	65	1	21	0	10%						
Mojave	935	0	11	0	5%	Santa Barbara	931	3	11	1	7%	Fort Morgan	807	1	2	0	1%	Norwich	63	0	14	0	6%						
Novato	949	3	27	1	14%	Santa Rosa	954	3	10	1	6%	Glenwood Springs	816	2	7	1	4%	Stamford	068-069	4	28	1	15%						
Oakland	945-947	3	35	1	18%	Stockton	952	1	2	0	1%	Grand Junction	814-815	1	-4	0	-1%	Waterbury	67	1	19	0	9%						
Orange	928	3	19	1	10%	Sunnyvale	940	3	38	1	19%	Greeley	806	2	5	1	3%	West Hartford	62	1	15	0	7%						
Oxnard	930	3	7	1	5%	Van Nuys	913-916	3	13	1	8%	Longmont	805	3	2	1	3%	Delaware Average											
Pasadena	910-912	3	15	1	8%	Whittier	906	3	13	1	8%	Pagosa Springs	811	0	-10	0	-5%	Dover	199	1	-8	0	-3%						
Rancho Cordova	956-957	2	12	1	7%	Colorado Average						Connecticut Average																	
Redding	960	1	-7	0	-3%	Aurora	800-801	2	6	1	4%	Bridgeport	66	1	21	0	10%	Newark	197	2	14	1	8%						
Richmond	948	2	38	1	19%	Boulder	803-804	3	-1	1	1%	Bristol	60	1	25	0	12%	Wilmington	198	0	13	0	6%						
Riverside	925	1	7	0	4%	Colorado Springs	808-809	2	-6	1	-2%	Fairfield	64	2	24	1	12%	District of Columbia Average											
Sacramento	958	1	12	0	6%	Denver	802	2	11	1	6%	Hartford	61	0	22	0	10%	Average	3	25	1	13%							
Salinas	939	3	1	1	2%	Durango	813	1	-5	0	-2%	New Haven	65	1	21	0	10%	Washington	200-205	3	25	1	13%						
San Bernardino	923-924	0	5	0	2%	Fort Morgan	807	1	2	0	1%	Norwich	63	0	14	0	6%	Florida Average											
San Diego	919-921	3	15	1	8%	Glenwood Springs	816	2	7	1	4%	Stamford	068-069	4	28	1	15%	Altamonte Springs	327	-1	-12	0	-6%						
San Francisco	941	3	58	1	28%	Grand Junction	814-815	1	-4	0	-1%	Waterbury	67	1	19	0	9%	Bradenton	342	0	-16	0	-7%						
San Jose	901-951	3	35	1	18%	Greeley	806	2	5	1	3%	West Hartford	62	1	15	0	7%	Brooksville	346	-1	-16	0	-8%						
San Mateo	943-944	4	34	1	18%	Longmont	805	3	2	1	3%	Georgia Average																	
Santa Barbara	931	3	11	1	7%	Pagosa Springs	811	0	-10	0	-5%	Albany	317	-2	-19	-1	-10%												
Santa Rosa	954	3	10	1	6%	Pueblo	810	-1	8	0	3%	Athens	306	0	-16	0	-7%												
Stockton	952	1	2	0	1%	Salida	812	1	-11	0	-5%	Atlanta	303	3	23	1	12%												
Sunnyvale	940	3	38	1	19%	Connecticut Average						District of Columbia Average																	
Van Nuys	913-916	3	13	1	8%	Bridgeport	66	1	21	0	10%	Average	3	25	1	13%													
Whittier	906	3	13	1	8%	Bristol	60	1	25	0	12%	Florida	-1	-13	0	-6%													
Colorado Average						Connecticut Average						District of Columbia Average																	
Aurora	800-801	2	6	1	4%	Bridgeport	66	1	21	0	10%	Washington	200-205	3	25	1	13%												
Boulder	803-804	3	-1	1	1%	Bristol	60	1	25	0	12%	Florida Average																	
Colorado Springs	808-809	2	-6	1	-2%	Fairfield	64	2	24	1	12%	Altamonte Springs	327	-1	-12	0	-6%												
Denver	802	2	11	1	6%	Hartford	61	0	22	0	10%	Bradenton	342	0	-16	0	-7%												
Durango	813	1	-5	0	-2%	New Haven	65	1	21	0	10%	Brooksville	346	-1	-16	0	-8%												
Fort Morgan	807	1	2	0	1%	Norwich	63	0	14	0	6%	Daytona Beach	321	-2	-21	-1	-11%												
Glenwood Springs	816	2	7	1	4%	Stamford	068-069	4	28	1	15%	Fort Lauderdale	333	2	-3	1	0%												
Grand Junction	814-815	1	-4	0	-1%	Waterbury	67	1	19	0	9%	Fort Myers	339	0	-20	0	-9%												
Greeley	806	2	5	1	3%	West Hartford	62	1	15	0	7%	Fort Pierce	349	-2	-26	-1	-13%												
Longmont	805	3	2	1	3%	Delaware Average						Georgia Average																	
Pagosa Springs	811	0	-10	0	-5%	Dover	199	1	-8	0	-3%	Albany	317	-2	-19	-1	-10%												
Pueblo	810	-1	8	0	3%	Newark	197	2	14	1	8%	Athens	306	0	-16	0	-7%												
Salida	812	1	-11	0	-5%	Wilmington	198	0	13	0	6%	Atlanta	303	3	23	1	12%												
Connecticut Average						Delaware Average						District of Columbia Average																	
Bridgeport	66	1	21	0	10%	Dover	199	1	-8	0	-3%	Average	3	25	1	13%													
Bristol	60	1	25	0	12%	Newark	197	2	14	1	8%	Florida	-1	-13	0	-6%													
Fairfield	64	2	24	1	12%	Wilmington	198	0	13	0	6%	Washington	200-205	3	25	1	13%												
Hartford	61	0	22	0	10%	District of Columbia Average						Florida Average																	
New Haven	65	1	21	0	10%	Average	3	25	1	13%	Altamonte Springs	327	-1	-12	0	-6%													
Norwich	63	0	14	0	6%	Washington	200-205	3	25	1	13%	Bradenton	342	0	-16	0	-7%												
Stamford	068-069	4	28	1	15%	Florida Average						Georgia Average																	
Waterbury	67	1	19	0	9%	Altamonte Springs	327	-1	-12	0	-6%	Albany	317	-2	-19	-1	-10%												
West Hartford	62	1	15	0	7%	Bradenton	342	0	-16	0	-7%	Athens	306	0	-16	0	-7%												
Delaware Average						District of Columbia Average						Florida Average																	
Dover	199	1	-8	0	-3%	Average	3	25	1	13%	Altamonte Springs	327	-1	-12	0	-6%													
Newark	197	2	14	1	8%	Washington	200-205	3	25	1	13%	Bradenton	342	0	-16	0	-7%												
Wilmington	198	0	13	0	6%	Florida Average						Georgia Average																	
District of Columbia Average						Florida Average						Georgia Average																	
Average	3	25	1	13%	Altamonte Springs	327	-1	-12	0	-6%	Albany	317	-2	-19	-1	-10%													
Washington	200-205	3	25	1	13%	Bradenton	342	0	-16	0	-7%	Athens	306	0	-16	0	-7%												
Florida Average						Georgia Average						Hawaii Average																	
Altamonte Springs	327	-1	-12	0	-6%	Albany	317	-2	-19	-1	-10%	Aliamanu	968	17	35	6	25%												
Bradenton	342	0	-16	0	-7%	Athens	306	0	-16	0	-7%	Ewa	967	17	31	6	23%												
Brooksville	346	-1	-16	0	-8%	Atlanta	303	3	23	1	12%	Halawa Heights	967	17	31	6	23%												
Daytona Beach	321	-2	-21	-1	-11%	Augusta	308-309	-2	-10	-1	-6%	Hilo	967	17	31	6	23%												
Fort Lauderdale	333	2	-3	1	0%	Buford	305	0	-8	0	-4%	Honolulu	968	17	35	6	25%												
Fort Myers	339	0	-20	0	-9%	Calhoun	307	-1	-21	0	-10%	Kailua	968	17	35	6	25%												
Fort Pierce	349	-2	-26	-1	-13%	Columbus	318-319	-1	-10	0	-5%	Luualualei	967	17	31	6	23%												
Gainesville	326	-1	-20	0	-10%	Dublin/Fort Valley	310	-3	-15	-1	-8%	Milliani Town	967	17	31	6	23%												
Jacksonville	322	-1	-5	0	-3%	Hinesville	313	-2	-10	-1	-6%	Pearl City	967	17	31	6	23%												
Lakeland	338	-3	-15	-1	-8%	Kings Bay	315	-2	-17	-1	-9%	Wahiaawa	967	17	31														

Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
Idaho Average		0	-16	0	-8%	Hutchinson	675	-3	-12	-1	-7%	Michigan Average		-2	5	-1	1%
Boise	837	1	-5	0	-2%	Independence	673	-3	0	-1	-2%	Battle Creek	490-491	-3	4	-1	0%
Coeur d'Alene	838	0	-21	0	-10%	Kansas City	660-662	0	11	0	5%	Detroit	481-482	0	23	0	11%
Idaho Falls	834	-1	-16	0	-8%	Liberal	679	-2	-19	-1	-10%	Flint	484-485	-3	-3	-1	-3%
Lewiston	835	0	-22	0	-10%	Salina	674	-3	-11	-1	-7%	Grand Rapids	493-495	-1	5	0	2%
Meridian	836	0	-15	0	-7%	Topeka	664-666	-3	-4	-1	-3%	Grayling	497	1	-15	0	-6%
Pocatello	832	-1	-14	0	-7%	Wichita	670-672	-2	-8	-1	-5%	Jackson	492	-3	0	-1	-2%
Sun Valley	833	-1	-21	0	-10%							Lansing	488-489	0	3	0	1%
Illinois Average		-1	12	0	5%	Kentucky Average		-1	-8	0	-4%	Marquette	498-499	-1	-2	0	-1%
Arlington Heights	600	1	31	0	15%	Ashland	411-412	-3	-2	-1	-3%	Pontiac	483	-3	25	-1	10%
Aurora	605	2	30	1	15%	Bowling Green	421	0	-12	0	-6%	Royal Oak	480	-2	22	-1	9%
Belleville	622	-2	12	-1	4%	Campton	413-414	-1	-16	0	-8%	Saginaw	486-487	-2	-5	-1	-3%
Bloomington	617	1	4	0	2%	Covington	410	-1	4	0	1%	Traverse City	496	-1	2	0	0%
Carbondale	629	-3	-10	-1	-6%	Elizabethtown	427	-1	-16	0	-8%	Minnesota Average		0	1	0	0%
Carol Stream	601	2	30	1	15%	Frankfort	406	1	-8	0	-3%	Bemidji	566	-1	-8	0	-4%
Centralia	628	-3	-6	-1	-4%	Hazard	417-418	-1	-9	0	-5%	Brainerd	564	0	-4	0	-2%
Champaign	618	-1	5	0	2%	Hopkinsville	422	-2	-11	-1	-6%	Duluth	566-568	-2	2	-1	0%
Chicago	606-608	2	35	1	17%	Lexington	403-405	1	2	0	1%	Fergus Falls	565	-1	-13	0	-7%
Decatur	623	-2	-12	-1	-7%	London	407-409	-1	-8	0	-4%	Magnolia	561	0	-15	0	-7%
Galesburg	614	-2	-9	-1	-5%	Louisville	400-402	-1	-1	0	-1%	Mankato	560	0	-7	0	-3%
Granite City	620	-3	15	-1	5%	Owensboro	423	-2	-3	-1	-2%	Minneapolis	553-555	1	23	0	11%
Green River	612	-2	10	-1	4%	Paducah	420	-2	-6	-1	-4%	Rochester	559	0	-5	0	-2%
Joliet	604	0	33	0	15%	Pikeville	415-416	-3	-5	-1	-4%	St. Cloud	563	-1	15	0	6%
Kankakee	609	-2	2	-1	0%	Somerset	425-426	0	-25	0	-12%	St. Paul	550-551	1	23	0	11%
Lawrenceville	624	-4	-5	-1	-4%	White Plains	424	-2	-6	-1	-4%	Thief River Falls	567	0	-1	0	0%
Oak Park	603	3	38	1	19%	Louisiana Average		-1	2	-1	0%	Willmar	562	-1	-3	0	-2%
Peoria	615-616	-1	13	0	5%	Alexandria	713-714	-3	-10	-1	-6%	Mississippi Average		-2	-15	-1	-8%
Peru	613	0	15	0	7%	Baton Rouge	707-708	0	22	0	10%	Clarksdale	386	-3	-19	-1	-10%
Quincy	602	3	34	1	17%	Houma	703	-2	16	-1	6%	Columbus	397	-1	-5	0	-3%
Rockford	610-611	-2	12	-1	4%	Lafayette	705	0	5	0	2%	Greenville	387	-4	-25	-1	-14%
Springfield	625-627	-2	0	-1	-1%	Lake Charles	706	-3	4	-1	0%	Greenwood	389	-3	-18	-1	-10%
Urbana	619	-3	-8	-1	-5%	Mandeville	704	0	-1	0	0%	Gulfport	395	-2	-6	-1	-4%
Indiana Average		-2	0	-1	-1%	Minden	710	-2	-7	-1	-4%	Jackson	390-392	-3	-8	-1	-5%
Aurora	470	-1	-4	0	-2%	Monroe	712	-2	-13	-1	-7%	Laurel	394	-3	-10	-1	-6%
Bloomington	474	1	-6	0	-2%	New Orleans	700-701	0	11	0	5%	McComb	396	-2	-18	-1	-9%
Columbus	472	0	-9	0	-4%	Shreveport	711	-2	-3	-1	-2%	Meridian	393	-2	-16	-1	-8%
Elkhart	465	-2	-4	-1	-3%	Maine Average		-1	-12	0	-6%	Tupelo	388	-1	-20	0	-10%
Evansville	476-477	-2	25	-1	10%	Auburn	42	-1	-10	0	-5%	Missouri Average		-1	-8	-1	-4%
Fort Wayne	467-468	-3	-4	-1	-3%	Augusta	43	-1	-12	0	-6%	Cape Girardeau	637	-2	-8	-1	-5%
Gary	463-464	-4	43	-1	18%	Bangor	44	-2	-14	-1	-8%	Caruthersville	638	-1	-22	0	-11%
Indianapolis	460-462	-1	12	0	5%	Bath	45	1	-13	0	-5%	Chillicothe	646	-2	-17	-1	-9%
Jasper	475	-1	-14	0	-7%	Brunswick	39-40	1	-5	0	-2%	Columbia	652	1	-10	0	-4%
Jeffersonville	471	-1	-6	0	-3%	Camden	48	-1	-19	0	-9%	East Lynne	647	-1	-11	0	-6%
Kokomo	469	-2	-15	-1	-8%	Cutler	46	-1	-21	0	-10%	Farmington	636	-3	-16	-1	-9%
Lafayette	479	-1	-9	0	-5%	Dexter	49	-2	-10	-1	-6%	Hannibal	634	1	-10	0	-4%
Muncie	473	-4	-13	-1	-8%	Northern Area	47	-2	-20	-1	-10%	Independence	640	-2	13	-1	5%
South Bend	466	-4	-1	-1	-3%	Portland	41	2	0	1	1%	Jefferson City	650-651	1	-10	0	-4%
Terre Haute	478	-4	0	-1	-2%	Maryland Average		1	6	0	3%	Joplin	648	-2	-15	-1	-8%
Iowa Average		-2	-7	-1	-4%	Annapolis	214	3	10	1	6%	Kansas City	641	-2	16	-1	6%
Burlington	526	0	-6	0	-3%	Baltimore	210-212	-1	18	0	8%	Kirksville	635	0	-21	0	-10%
Carroll	514	-3	-18	-1	-10%	Bethesda	208-209	3	26	1	14%	Knob Noster	653	0	-10	0	-5%
Cedar Falls	506	-1	-6	0	-3%	Church Hill	216	2	-10	1	-4%	Lebanon	654-655	-2	-21	-1	-11%
Cedar Rapids	522-524	0	3	0	1%	Cumberland	215	-4	-11	-1	-7%	Poplar Bluff	639	-1	-12	0	-6%
Cherokee	510	-3	-5	-1	-4%	Elkton	219	2	4	1	3%	Saint Charles	633	1	1	0	1%
Council Bluffs	515	-2	-11	-1	-6%	Frederick	217	1	5	0	3%	Saint Joseph	644-645	-3	6	-1	1%
Creston	508	-3	-11	-1	-7%	Laurel	206-207	2	18	1	9%	Springfield	656-658	-2	-16	-1	-8%
Davenport	527-528	-1	2	0	0%	Salisbury	218	1	-9	0	-4%	St. Louis	630-631	-2	14	-1	5%
Decorah	521	-2	-7	-1	-4%	Massachusetts Average		2	25	1	12%	Montana Average		0	-6	0	-3%
Des Moines	500-503	-2	10	-1	4%	Ayer	015-016	1	16	0	8%	Billings	590-591	0	3	0	1%
Dubuque	520	-1	1	0	0%	Bedford	017	3	36	1	18%	Butte	597	1	-10	0	-4%
Fort Dodge	505	-2	-7	-1	-4%	Boston	021-022	3	75	1	36%	Fairview	592	-1	1	0	0%
Mason City	504	0	-7	0	-3%	Brockton	023-024	2	44	1	21%	Great Falls	594	-1	-5	0	-3%
Ottumwa	525	0	-13	0	-6%	Cape Cod	026	2	3	1	2%	Havre	595	-1	-14	0	-7%
Sheldon	512	0	-17	0	-8%	Chicopee	010	1	14	0	7%	Helena	596	0	-5	0	-2%
Shenandoah	516	-3	-27	-1	-14%	Dedham	019	3	33	1	17%	Kalispell	599	1	-12	0	-5%
Sioux City	511	-2	1	-1	-1%	Fitchburg	014	2	27	1	13%	Miles City	593	-1	-3	0	-2%
Spencer	513	-1	-14	0	-7%	Hingham	020	3	41	1	20%	Missoula	598	1	-12	0	-5%
Waterloo	507	-4	-6	-1	-5%	Lawrence	018	2	32	1	16%	Nebraska Average		-1	-19	0	-9%
Kansas Average		-2	-12	-1	-7%	Nantucket	025	3	18	1	10%	Alliance	693	-1	-23	0	-11%
Colby	677	-1	-22	0	-11%	New Bedford	027	2	15	1	8%	Columbus	686	0	-14	0	-6%
Concordia	669	-1	-26	0	-12%	Northfield	013	1	0	0	1%	Grand Island	688	0	-18	0	-8%
Dodge City	678	-2	-8	-1	-5%	Pittsfield	012	1	2	0	1%	Hastings	689	0	-21	0	-10%
Emporia	668	-3	-23	-1	-12%	Springfield	011	-1	17	0	7%	Lincoln	683-685	0	-10	0	-5%
Fort Scott	667	-2	-12	-1	-7%												
Hays	676	-2	-28	-1	-14%												

Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.
McCook	690	0	-27	0	-12%	Rochester	144-146	-3	7	-1	2%	Grants Pass	975	2	-14	1	-5%
Norfolk	687	-3	-18	-1	-10%	Rockaway	116	3	30	1	15%	Klamath Falls	976	2	-21	1	-9%
North Platte	691	0	-21	0	-10%	Rome	133-134	-3	-1	-1	-2%	Pendleton	978	0	-7	0	-3%
Omaha	680-681	-1	-3	0	-2%	Staten Island	103	3	22	1	12%	Portland	970-972	2	19	1	10%
Valentine	692	-2	-33	-1	-16%	Stewart	127	-1	-9	0	-5%	Salem	973	2	-8	1	-3%
Nevada Average	2	11	1	6%	Syracuse	130-132	-3	8	-1	2%	Pennsylvania Average	-3	2	-1	-1%		
Carson City	897	2	-9	1	-3%	Tonawanda	141	-4	2	-1	-1%	Allentown	181	-2	11	-1	4%
Elko	898	1	65	0	30%	Utica	135	-4	-3	-1	-3%	Altoona	166	-3	-11	-1	-7%
Ely	893	2	-7	1	-2%	Watertown	136	-2	26	-1	11%	Beaver Springs	178	-3	-6	-1	-4%
Fallon	894	2	6	1	4%	West Point	109	1	22	0	11%	Bethlehem	180	-1	14	0	6%
Las Vegas	889-891	2	8	1	5%	White Plains	105-108	3	34	1	17%	Bradford	167	-4	-9	-1	-6%
Reno	895	2	1	1	2%	North Carolina Average	1	-10	0	-4%	Butler	160	-4	5	-1	0%	
New Hampshire Average	1	0	0	0%	Asheville	287-289	1	-19	0	-8%	Chambersburg	172	-1	-13	0	-7%	
Charlestown	036	1	-9	0	-4%	Charlotte	280-282	1	4	0	2%	Clearfield	168	2	-3	1	0%
Concord	034	1	-4	0	-1%	Durham	277	2	-1	1	1%	DuBois	158	-2	-18	-1	-9%
Dover	038	0	7	0	3%	Elizabeth City	279	1	-15	0	-6%	East Stroudsburg	183	0	-7	0	-3%
Lebanon	037	2	-7	1	-2%	Fayetteville	283	-1	-17	0	-8%	Erie	164-165	-3	-9	-1	-6%
Littleton	035	-1	-6	0	-3%	Goldsboro	275	1	-4	0	-1%	Genesee	169	-4	0	-1	-2%
Manchester	032-033	0	5	0	2%	Greensboro	274	1	-8	0	-3%	Greensburg	156	-4	1	-1	-2%
New Boston	030-031	1	11	1	6%	Hickory	286	-1	-17	0	-8%	Harrisburg	170-171	-2	6	-1	2%
New Jersey Average	1	27	0	13%	Kinston	285	-1	-21	0	-10%	Hazleton	182	-3	-3	-1	-3%	
Atlantic City	080-084	-2	22	-1	9%	Raleigh	276	3	-1	1	1%	Johnstown	159	-4	-15	-1	-9%
Brick	087	2	10	1	6%	Rocky Mount	278	-1	-15	0	-7%	Kittanning	162	-4	-11	-1	-7%
Dover	078	1	26	0	12%	Wilmington	284	1	-4	0	-1%	Lancaster	175-176	-2	2	-1	0%
Edison	088-089	1	32	0	15%	Winston-Salem	270-273	0	-10	0	-5%	Meadville	163	-4	-21	-1	-12%
Hackensack	076	3	26	1	14%	North Dakota Average	-1	6	0	2%	Montrose	188	-3	-3	-1	-3%	
Monmouth	077	3	31	1	16%	Bismarck	585	0	4	0	2%	New Castle	161	-4	-3	-1	-3%
Newark	071-073	2	29	1	14%	Dickinson	586	-1	21	0	9%	Philadelphia	190-191	-3	34	-1	14%
Passaic	070	2	30	1	15%	Fargo	580-581	0	4	0	2%	Pittsburgh	152	-4	22	-1	8%
Paterson	074-075	2	23	1	12%	Grand Forks	582	0	1	0	0%	Pottsville	179	-4	-12	-1	-8%
Princeton	085	-2	33	-1	14%	Jamestown	584	-1	-5	0	-3%	Punxsutawney	157	-4	-6	-1	-5%
Summit	079	3	37	1	19%	Minot	587	-1	9	0	4%	Reading	195-196	-4	10	-1	2%
Trenton	086	-3	29	-1	12%	Nekoma	583	-1	-18	0	-9%	Scranton	184-185	-2	-2	-1	-2%
New Mexico Average	0	-20	0	-9%	Williston	588	-1	32	0	14%	Somerset	155	-4	-12	-1	-8%	
Alamogordo	883	-1	-21	0	-10%	Ohio Average	-2	1	-1	-1%	Southeastern	193	0	19	0	9%	
Albuquerque	870-871	2	-8	1	-3%	Akron	442-443	-2	2	-1	0%	Uniontown	154	-4	-7	-1	-5%
Clovis	881	-2	-26	-1	-13%	Canton	446-447	-2	-4	-1	-3%	Valley Forge	194	-3	35	-1	15%
Farmington	874	2	-2	1	0%	Chillicothe	456	-2	-8	-1	-5%	Warminster	189	-1	26	0	11%
Fort Sumner	882	-3	-1	-1	-2%	Cincinnati	450-452	-1	8	0	3%	Warrendale	150-151	-4	21	-1	8%
Gallup	873	1	-18	0	-8%	Cleveland	440-441	-3	11	-1	3%	Washington	153	-3	23	-1	9%
Holman	877	2	-22	1	-9%	Columbus	432	0	9	0	4%	Wilkes Barre	186-187	-3	1	-1	-1%
Las Cruces	880	-2	-23	-1	-12%	Dayton	453-455	-3	-2	-1	-3%	Williamsport	177	-3	5	-1	1%
Santa Fe	875	3	-23	1	-9%	Lima	458	-3	-8	-1	-5%	York	173-174	-3	4	-1	0%
Socorro	878	1	-34	0	-15%	Marietta	457	-2	-6	-1	-4%	Rhode Island Average	1	12	0	6%	
Truth or Consequences	879	-2	-38	-1	-19%	Marion	433	-3	-9	-1	-6%	Bristol	28	1	11	0	6%
Tucumcari	884	-1	-20	0	-10%	Newark	430-431	-1	7	0	3%	Coventry	028	1	11	0	6%
New York Average	0	19	0	9%	Sandusky	448-449	-1	-2	0	-1%	Cranston	029	1	14	0	7%	
Albany	120-123	0	22	0	10%	Steubenville	439	-3	-2	-1	-3%	Davisville	028	1	11	0	6%
Amityville	117	2	25	1	13%	Toledo	434-436	-1	12	0	5%	Narragansett	028	1	11	0	6%
Batavia	140	-3	5	-1	1%	Warren	444	-4	-4	-1	-4%	Newport	028	1	11	0	6%
Binghamton	137-139	-3	6	-1	1%	Youngstown	445	-5	3	-2	-1%	Providence	029	1	14	0	7%
Bronx	104	2	32	1	16%	Zanesville	437-438	-2	5	-1	1%	Warwick	028	1	11	0	6%
Brooklyn	112	3	22	1	12%	Oklahoma Average	-3	-12	-1	-7%	South Carolina Average	0	-10	0	-5%		
Buffalo	142	-4	6	-1	1%	Adams	739	-2	-20	-1	-10%	Aiken	298	0	9	0	4%
Elmira	149	-4	4	-1	0%	Ardmore	734	-3	-11	-1	-7%	Beaufort	299	-1	-16	0	-8%
Flushing	113	3	43	1	21%	Clinton	736	-3	-11	-1	-7%	Charleston	294	-1	-5	0	-3%
Garden City	115	3	37	1	19%	Durant	747	-4	-19	-1	-11%	Columbia	290-292	0	-9	0	-4%
Hicksville	118	3	33	1	17%	Enid	737	-4	-13	-1	-8%	Greenville	296	0	-9	0	-4%
Ithaca	148	-4	-2	-1	-3%	Lawton	735	-3	-15	-1	-8%	Myrtle Beach	295	0	-20	0	-9%
Jamaica	114	3	40	1	20%	McAlester	745	-4	-19	-1	-11%	Rock Hill	297	0	-18	0	-8%
Jamestown	147	-4	-5	-1	-4%	Muskogee	744	-2	-23	-1	-12%	Spartanburg	293	-1	-14	0	-7%
Kingston	124	0	-7	0	-3%	Norman	730	-2	-4	-1	-3%	South Dakota Average	-1	-13	0	-6%	
Long Island	111	3	72	1	35%	Oklahoma City	731	-2	-2	-1	-2%	Aberdeen	574	-1	-11	0	-6%
Montauk	119	1	22	0	11%	Ponca City	746	-3	-5	-1	-4%	Mitchell	573	0	-15	0	-7%
New York (Manhattan)	100-102	3	74	1	36%	Poteau	749	-2	-19	-1	-10%	Mobridge	576	-1	-22	0	-11%
New York City	100-102	3	74	1	36%	Pryor	743	-2	-22	-1	-11%	Pierre	575	-1	-21	0	-10%
Newcomb	128	-1	1	0	0%	Shawnee	748	-4	-18	-1	-10%	Rapid City	577	-1	-11	0	-6%
Niagara Falls	143	-4	-10	-1	-7%	Tulsa	740-741	-1	-3	0	-2%	Sioux Falls	570-571	0	-2	0	-1%
Plattsburgh	129	1	-2	0	0%	Woodward	738	-4	8	-1	2%	Watertown	572	-1	-11	0	-6%
Poughkeepsie	125-126	0	5	0	2%	Oregon Average	1	-9	1	-3%	Tennessee Average	-1	-3	0	-2%		
Queens	110	4	44	1	22%	Adrian	979	-1	-17	0	-8%	Chattanooga	374	-1	5	0	2%
						Bend	977	1	-15	0	-6%	Clarksville	370	1	4	0	2%
						Eugene	974	2	-5	1	-1%	Cleveland	373	-1	-1	0	-1%

Area Modification Factors

Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.	Location	Zip	Mat.	Lab.	Equip.	Total Wtd. Avg.			
Columbia	384	0	-15	0	-7%	Charlottesville	229	1	-13	0	-5%	Gillette	827	-1	6	0	2%			
Cookeville	385	0	-16	0	-7%	Chesapeake	233	-1	-1	0	-1%	Powell	824	0	-13	0	-6%			
Jackson	383	-1	-3	0	-2%	Culpeper	227	2	-12	1	-4%	Rawlins	823	0	1	0	0%			
Kingsport	376	0	-8	0	-4%	Farmville	239	-2	-24	-1	-12%	Riverton	825	-1	-9	0	-5%			
Knoxville	377-379	-1	-2	0	-1%	Fredericksburg	224-225	1	-12	0	-5%	Rock Springs	829-831	0	6	0	3%			
McKenzie	382	-2	-17	-1	-9%	Galax	243	-2	-20	-1	-10%	Sheridan	828	0	-8	0	-4%			
Memphis	380-381	-2	8	-1	3%	Harrisonburg	228	1	-16	0	-7%	Wheatland	822	0	-21	0	-10%			
Nashville	371-372	1	10	0	5%	Lynchburg	245	-2	-18	-1	-9%	UNITED STATES TERRITORIES								
Texas Average					-2 -2 -1 -2%	Norfolk	235-237	0	-1	0	0%	Guam	53	-21	-5	18%				
Abilene	795-796	-4	-3	-1	-3%	Petersburg	238	-2	-10	-1	-6%	Puerto Rico	2	-47	-5	-21%				
Amarillo	790-791	-2	-5	-1	-3%	Radford	241	-1	-22	0	-11%	VIRGIN ISLANDS (U.S.)								
Arlington	760	-1	1	0	0%	Reston	201	3	18	1	10%	St. Croix	18	-15	-4	2%				
Austin	786-787	1	4	0	2%	Richmond	232	-1	3	0	1%	St. John	52	-15	-4	20%				
Bay City	774	-2	53	-1	23%	Roanoke	240	-1	-22	-1	-11%	St. Thomas	23	-15	-4	5%				
Beaumont	776-777	-3	19	-1	7%	Staunton	244	0	-18	0	-8%	CANADIAN AREA MODIFIERS								
Brownwood	768	-3	-18	-1	-10%	Tazewell	246	-3	-13	-1	-8%	These figures assume an exchange rate of \$1.00 Canadian to \$1.00 U.S.								
Bryan	778	0	-11	0	-5%	Virginia Beach	234	0	-8	0	-4%	Alberta Average	23	8	10	16%				
Childress	792	-3	-31	-1	-16%	Williamsburg	230-231	0	-9	0	-4%	Calgary	23	10	10	17%				
Corpus Christi	783-784	-3	6	-1	1%	Winchester	226	0	-16	0	-7%	Edmonton	22	10	10	17%				
Dallas	751-753	-1	10	0	4%	Washington Average					1	-1	0	0%	Fort McMurray	25	2	10	14%	
Del Rio	788	-3	-15	-1	-8%	Clarkston	994	0	-19	0	-9%	British Columbia Average					23	-6	10	10%
El Paso	798-799	-3	-22	-1	-12%	Everett	982	2	3	1	2%	Fraser Valley	23	-7	10	9%				
Fort Worth	761-762	-2	1	-1	-1%	Olympia	985	2	-7	1	-2%	Okanagan	24	-9	10	9%				
Galveston	775	-3	21	-1	8%	Pasco	993	0	9	0	4%	Vancouver	23	-2	10	11%				
Giddings	789	0	-9	0	-4%	Seattle	980-981	3	24	1	13%	Manitoba Average					17	-13	8	3%
Greenville	754	-3	8	-1	2%	Spokane	990-992	0	-2	0	-1%	North Manitoba	17	-13	8	3%				
Houston	770-772	-1	23	0	10%	Tacoma	983-984	1	4	0	2%	South Manitoba	17	-13	8	3%				
Huntsville	773	-2	25	-1	10%	Vancouver	986	2	1	1	2%	Selkirk	17	-13	8	3%				
Huntview	756	-3	-4	-1	-3%	Wenatchee	988	1	-11	0	-5%	Winnipeg	17	-13	8	3%				
Lubbock	793-794	-3	-15	-1	-8%	Yakima	989	0	-9	0	-4%	New Brunswick Average					13	-38	6	-11%
Lufkin	759	-3	-4	-1	-3%	West Virginia Average					-2	-9	-1	-5%	Moncton	13	-38	6	-11%	
McAllen	785	-3	-27	-1	-14%	Beckley	258-259	1	-10	0	-4%	Nova Scotia Average					13	-27	6	-5%
Midland	797	-3	14	-1	5%	Bluefield	247-248	-1	-2	0	-1%	Amherst	13	-27	6	-6%				
Palestine	758	-2	-10	-1	-6%	Charleston	250-253	1	11	0	6%	Nova Scotia	14	-26	7	-5%				
Plano	750	-1	11	0	5%	Clarksburg	263-264	-3	-5	-1	-4%	Sydney	14	-28	7	-6%				
San Angelo	769	-3	-14	-1	-8%	Fairmont	266	0	-23	0	-11%	Newfoundland/Labrador Average					16	-32	7	-6%
San Antonio	780-782	-3	-1	-1	-2%	Huntington	255-257	-1	0	0	-1%	Ontario Average					19	-2	8	9%
Texarkana	755	-3	-16	-1	-9%	Lewisburg	249	-2	-30	-1	-15%	London	19	-1	8	10%				
Tyler	757	-1	-14	0	-7%	Martinsburg	254	-1	-16	0	-8%	Thunder Bay	21	-5	9	9%				
Victoria	779	-3	-4	-1	-3%	Morgantown	265	-3	0	-1	-2%	Toronto	18	0	8	10%				
Waco	765-767	-3	-10	-1	-6%	New Martinsville	262	-3	-13	-1	-8%	Quebec Average					16	-15	7	2%
Wichita Falls	763	-3	-16	-1	-9%	Parkersburg	261	-3	2	-1	-1%	Montreal	16	-15	7	2%				
Woodson	764	-3	-16	-1	-9%	Romney	267	-4	-11	-1	-7%	Quebec City	16	-15	7	2%				
Utah Average					1 -8 1 -3%	Sugar Grove	268	-3	-23	-1	-12%	Saskatchewan Average					20	-9	9	6%
Clearfield	840	2	-2	1	0%	Wheeling	260	-3	-3	-1	-3%	La Ronge	21	-12	9	6%				
Green River	845	1	-2	0	0%	Wisconsin Average					-1	0	0	0%	Prince Albert	19	-11	8	5%	
Ogden	843-844	0	-16	0	-7%	Amery	540	0	-1	0	0%	Saskatoon	19	-5	8	8%				
Provo	846-847	2	-22	1	-9%	Beloit	535	0	9	0	4%									
Salt Lake City	841	2	1	1	2%	Clam Lake	545	-1	-16	0	-8%									
Vermont Average					1 -9 0 -4%	Eau Claire	547	-1	0	0	-1%									
Albany	058	1	-12	0	-5%	Green Bay	541-543	0	2	0	1%									
Battleboro	053	1	-8	0	-3%	La Crosse	546	-2	-2	-1	-2%									
Beecher Falls	059	1	-13	0	-5%	Lady Smith	548	-2	-9	-1	-5%									
Bennington	052	-1	-14	0	-7%	Madison	537	2	15	1	8%									
Burlington	054	2	4	1	3%	Milwaukee	530-534	0	15	0	7%									
Montpelier	056	2	-9	1	-3%	Oshkosh	549	-1	3	0	1%									
Rutland	057	-1	-15	0	-7%	Portage	539	0	3	0	1%									
Springfield	051	-1	-9	0	-5%	Prairie du Chien	538	-2	-8	-1	-5%									
White River Junction	050	1	-9	0	-4%	Wausau	544	-1	-5	0	-3%									
Virginia Average					0 -9 0 -5%	Wyoming Average					0 -5 0 -2%									
Abingdon	242	-2	-9	-1	-5%	Casper	826	-2	7	-1	2%									
Alexandria	220-223	3	24	1	13%	Cheyenne/Laramie	820	1	-12	0	-5%									

Credits and Acknowledgments

This book has over 30,000 cost estimates for 2013. To develop these estimates, the editors relied on information supplied by hundreds of construction cost authorities. We offer our sincere thanks to the contractors, engineers, design professionals, construction estimators, material suppliers and manufacturers who, in the spirit of cooperation, have assisted in the preparation of this Sixty-first Edition of the National Construction Estimator. Many of the cost authorities who supplied information for this volume are listed below.

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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	1.63	6.54	14.70	26.10
16" OC members	CSF	1.23	4.90	11.00	19.60
20" OC members	CSF	.98	3.92	8.82	15.70
24" OC members	CSF	.82	3.27	7.35	13.10
Wall sheathing or shear panel adhesive, on walls					
16" OC members	CSF	2.63	10.50	23.70	42.20
20" OC members	CSF	2.11	8.43	19.00	33.70
24" OC members	CSF	1.76	7.03	15.80	28.10
Polystyrene or polyurethane foam panel adhesive, on walls					
12" OC members	CSF	3.19	12.70	28.70	51.00
16" OC members	CSF	2.39	9.56	21.50	38.20
20" OC members	CSF	1.91	7.65	17.20	30.60
24" OC members	CSF	1.59	6.37	14.30	25.50
Gypsum drywall adhesive					
12" OC members	CSF	1.39	5.55	12.50	22.20
16" OC members	CSF	1.04	4.17	9.37	16.70
20" OC members	CSF	.83	3.33	7.50	13.30
24" OC members	CSF	.69	2.78	6.25	11.10
Hardboard or plastic panel adhesive, on walls					
12" OC members	CSF	3.10	12.40	27.90	49.70
16" OC members	CSF	2.33	9.31	21.00	37.30
20" OC members	CSF	1.86	7.45	16.80	29.80
24" OC members	CSF	1.55	6.21	14.00	24.80

	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	—	3.60	3.60
16" OC members	BC@.090	CSF	—	3.24	3.24
20" OC members	BC@.084	CSF	—	3.02	3.02
24" OC members	BC@.084	CSF	—	3.02	3.02

Special purpose adhesives

Construction adhesive, for counters, cabinets, paneling, brick veneer, ceramic fixtures, shelving, sets in 10 minutes, 10.5 oz cartridge	—	Ea	1.79	—	1.79
Epoxy-tie adhesive, bonds concrete, fills cracks to 3/4", seals doors and windows, anchor grouting, non-shrink, 22 oz. cartridge	—	Ea	23.20	—	23.20
Gypsum drywall adhesive, waterproof, bonds to wood, metal, masonry, concrete, 29 oz. cartridge	—	Ea	4.55	—	4.55

Adhesives

	Craft@Hrs	Unit	Material	Labor	Total
Latex FRP adhesive, indoor, bonds wood, concrete, drywall, foamboard, trowel grade, gallon	—	Ea	15.50	—	15.50
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	14.00	—	14.00
Project adhesive, rubber-based, bonds plywood, hardboard fiberglass, drywall, foam board, shelving, ceramic fixtures, 10 minute work time, 10.5 oz cartridge	—	Ea	2.62	—	2.62

	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	11.60	—
Professional carpenter's glue, multi-purpose	Ea	—	21.20
Contact cement, rubber based, waterproof, bonds veneers to plywood, particleboard, wallboard	Ea	15.90	31.80
Gel contact cement	Ea	15.40	—
Resilient flooring adhesive, latex base, adheres to concrete, plywood, felt, sheet flooring	Ea	6.88	16.90
Tile cement, solvent base, ceramic/stone, interior	Ea	10.60	27.00

	Craft@Hrs	Unit	Material	Labor	Total
Aggregate Typical prices, 5 mile haul, 24 ton minimum. See also Roofing, Built-up					
Crushed stone (1.4 tons per CY)					
3/8" stone	—	Ton	22.60	—	22.60
3/4" (Number 3)	—	Ton	21.50	—	21.50
1-1/2" (Number 2)	—	Ton	22.60	—	22.60
Crushed slag, typical prices where available					
3/4" slag	—	Ton	14.50	—	14.50
1-1/2"	—	Ton	14.80	—	14.80
Washed gravel (1.4 tons per CY)					
3/4" gravel	—	Ton	22.60	—	22.60
1-1/2"	—	Ton	22.70	—	22.70
Fill sand (1.35 tons per CY)	—	Ton	10.50	—	10.50
Add per ton less than 24 tons	—	Ton	7.00	—	7.00
Add for delivery over 5 miles, one way	—	Mile	7.50	—	7.50

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	—	—	350.00
Over 2,500 SF to 3,500 SF	—	LS	—	—	400.00
Over 3,500 SF to 5,000 SF	—	LS	—	—	500.00
Over 5,000 SF	—	LS	—	—	750.00
Small residential income properties (duplex, triplex, quadriplex)					
2 to 4 units	—	LS	—	—	650.00
Apartment houses, commercial and industrial buildings					
To \$300,000 valuation	—	LS	—	—	3,000.00
Over \$300,000 to \$1,000,000 valuation	—	LS	—	—	4,000.00
Over \$1,000,000 to \$3,000,000 valuation	—	LS	—	—	4,500.00
Over \$3,000,000 to \$5,000,000 valuation	—	LS	—	—	5,500.00
Other services					
Additional photograph (each)	—	LS	—	—	25.00
Outlying area fee	—	LS	—	—	50.00
Satisfactory Completion (old Form 442 / new Form 1004d)	—	LS	—	—	125.00
Appraisal Update same comps (Form 1004d)	—	LS	—	—	250.00
Operating Income Statement (FNMA 216)	—	LS	—	—	75.00
SFR Rental Survey (FNMA 1007)	—	LS	—	—	75.00
Appraisal review (desk)	—	LS	—	—	150.00
Appraisal review (field)	—	LS	—	—	350.00
Drive-by appraisal (Form 2055) starting at	—	LS	—	—	250.00
Drive-by appraisal (Form 2070/2075)	—	LS	—	—	200.00
Machinery (Fee is based on total value of equipment appraised) Additional charges for travel and lodging may be required					
To \$30,000 valuation	—	LS	—	—	570.00
Over \$30,000 to \$100,000 valuation	—	LS	—	—	770.00
Over \$100,000 to \$500,000 valuation	—	LS	—	—	1,300.00
Over \$500,000 to \$1,000,000 valuation	—	LS	—	—	1,800.00
Over \$1,000,000 to \$5,000,000 valuation	—	LS	—	—	3,100.00
Court testimony (excluding preparation)	—	Day	—	—	1,400.00
Consulting fees are billed at an hourly rate	—	Hour	—	—	175.00
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	—	—	310.00
Weekday sessions after the initial consultation	—	Hr	—	—	155.00
Nonrefundable retainer for weekend mediation	—	Ea	—	—	375.00
Weekend mediation sessions	—	Hr	—	—	185.00

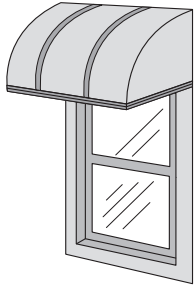
Architectural Illustrations Full color painting on watercolor board with matted frame with title and credit on matte. Glass and elaborate framing are extra. Costs for pen and ink illustrations with color Mylar overlay are similar to cost for watercolor illustrations. Typical fees.



Custom home, eye level view					
Simple rendering	—	LS	—	—	895.00
Complex rendering	—	LS	—	—	1,320.00
Custom home, bird's eye view					
Simple rendering	—	LS	—	—	1,080.00
Complex rendering	—	LS	—	—	1,530.00
Tract homes in groups of five or more (single floor plans, multiple elevations), eye level view					
Simple rendering	—	LS	—	—	528.00
Complex rendering	—	LS	—	—	732.00
Tract homes in groups of five or more (single floor plans, multiple elevations), bird's eye view					
Simple rendering	—	LS	—	—	681.00
Complex rendering	—	LS	—	—	1,090.00
Tract homes or condominium project, overall bird's eye view					
10-25 homes or living units	—	LS	—	—	3,360.00
Typical commercial structure					
Eye level view	—	LS	—	—	1,480.00
Bird's eye view	—	LS	—	—	1,660.00
Complex commercial structure					
Eye level view	—	LS	—	—	2,180.00
Bird's eye view	—	LS	—	—	2,820.00

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	—	—	570.00
Large condo or apartment projects	—	LS	—	—	1,430.00
Tract homes	—	LS	—	—	356.00
Commercial structure, line drawing	—	LS	—	—	1,070.00

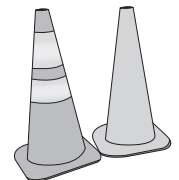


Awnings and Canopies for Doors and Windows Costs for awnings include all hardware. All have adjustable support arms to control angle height and preferred amount of window coverage. For larger size aluminum awnings, price two awnings and add for splice kit below. For commercial grade awnings, see the 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	63.60	58.60	122.20
48" wide x 30" long	SW@1.86	Ea	82.20	75.20	157.40
60" wide x 30" long	SW@2.07	Ea	102.00	83.70	185.70
72" wide x 30" long	SW@2.27	Ea	115.00	91.80	206.80
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	103.00	58.60	161.60
36" wide x 36" high	SW@1.45	Ea	155.00	58.60	213.60
48" wide x 48" high	SW@1.87	Ea	262.00	75.60	337.60
48" wide x 60" high	SW@1.87	Ea	371.00	75.60	446.60
60" wide x 72" high	SW@2.07	Ea	406.00	83.70	489.70
72" wide x 72" high	SW@2.26	Ea	557.00	91.40	648.40
Add for splice kit with overlap slats	SW@.218	Ea	21.50	8.81	30.31
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	197.00	61.50	258.50
48" wide	SW@1.94	Ea	236.00	78.40	314.40
Plastic awning with baked-on acrylic finish, ventilated side panels, and reinforced metal frame, hardware included. 24" drop, 24" projection					
36" wide	BC@1.58	Ea	145.00	56.90	201.90
42" wide	BC@1.75	Ea	161.00	63.00	224.00
48" wide	BC@2.02	Ea	185.00	72.70	257.70
60" wide	BC@2.26	Ea	207.00	81.40	288.40
72" wide	BC@2.47	Ea	223.00	88.90	311.90
96" wide	BC@2.79	Ea	283.00	100.00	383.00
Plastic door canopy with 36" projection					
42" wide	BC@1.80	Ea	305.00	64.80	369.80
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	51.00	48.60	99.60
36" wide	BC@1.58	Ea	67.00	56.90	123.90
42" wide	BC@1.80	Ea	62.50	64.80	127.30
48" wide	BC@2.02	Ea	73.40	72.70	146.10
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	310.00	73.10	383.10
8' x 15'	BC@2.03	Ea	426.00	73.10	499.10

Barricades, Construction Safety

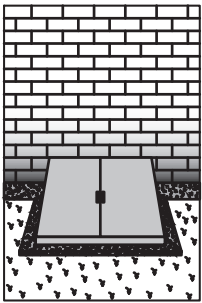
	Craft@Hrs	Unit	Material	Labor	Total
Barricades, Construction Safety Purchase prices except as noted. See also Equipment Rental in the index.					
Heavy Duty Plastic Type I barricade, Engineer Grade Reflectivity, 8" height Top Panel					
Quantities from 1 - 15 units	—	Ea	52.00	—	52.00
Quantities from 16 - 31 units	—	Ea	46.00	—	46.00
Pallet quantities, multiples of 32 units	—	Ea	41.00	—	41.00
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	57.20	—	57.20
Quantities from 16 - 31 units	—	Ea	47.00	—	47.00
Pallet quantities, multiples of 32 units	—	Ea	40.70	—	40.70
Type II, 2' wide, 3' high, Top panel 8" height, 1 reflectorized rail each side					
Quantities from 1 - 15 units	—	Ea	60.00	—	60.00
Quantities from 16 - 31 units	—	Ea	53.00	—	53.00
Pallet quantities, multiples of 32 units	—	Ea	47.90	—	47.90
Type III, 4' wide, 5' high, 3 reflectorized rails each side, wood & steel legs					
Quantities from 1 - 15 units	—	Ea	59.70	—	59.70
Quantities from 16 - 31 units	—	Ea	54.00	—	54.00
Pallet quantities, multiples of 32 units	—	Ea	47.50	—	47.50
Add for lighted units without batteries (batteries last 2 months)					
Amber lens	—	Ea	18.10	—	18.10
Red lens	—	Ea	19.00	—	19.00
Batteries, 6 volt (2 needed)	—	Ea	4.50	—	4.50
Utility barricade lights, solar powered Utility barricade solar powered lights, compliant with M.U.T.C.D. Specification 6E-5 and ITE Specifications for Flashing / Steady Burn warning light, 180 degree swivel base axis.					
Utility barricade solar powered lights	—	Ea	45.00	—	45.00
Miscellaneous signage/traffic control					
"Road Closed", reflectorized, 30" x 48", Engineer Grade					
—	—	Ea	83.30	—	83.30
"Construction Zone", 4' x 4' high intensity grade					
—	—	Ea	225.00	—	225.00
High-rise tripod with 3 orange flags					
—	—	Ea	181.00	—	181.00
Flags					
—	—	Ea	3.45	—	3.45
Traffic cones, PVC					
Non-reflectorized type					
18" high	—	Ea	10.20	—	10.20
28" high	—	Ea	14.30	—	14.30
Reflectorized type					
18" high	—	Ea	11.10	—	11.10
28" high	—	Ea	19.20	—	19.20
Lane delineator, 42" orange plastic cylinder with 2 reflectors on a 12 pound rubber base					
—	—	Ea	19.90	—	19.90
Mesh signs, orange, 48" x 48", includes brace and clamp					
—	—	Ea	64.50	—	64.50
Hand-held traffic paddles, "Stop" and "Slow"					
—	—	Ea	24.20	—	24.20



Basement Doors

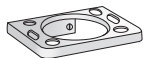
	Craft@Hrs	Unit	Material	Labor	Total
Utility Highway Barricade Rental					
Lighted units, rental, per day	—	Ea	.35	—	.35
Unlighted units, rental per day	—	Ea	.25	—	.25
Add for pickup and delivery, per trip	—	Ea	35.00	—	35.00
Typical labor cost, place and remove any barricade					
Per use	BL@.160	Ea	—	4.65	4.65
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.

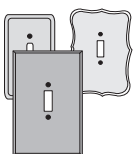


Doors (overall dimensions)					
Classic Series standard, all sizes	BC@3.41	Ea	782.00	123.00	905.00
SLW Series standard, all sizes	BC@3.41	Ea	810.00	123.00	933.00
Ultra Series,	BC@3.41	Ea	1,080.00	123.00	1,203.00
Add for keyed lock	BC@.160	Ea	95.00	5.76	100.76
Door extensions (available for 19-1/2"H, 55"W, 72"L door only)					
6" deep	BC@1.71	Ea	194.00	61.60	255.60
12" deep	BC@1.71	Ea	253.00	61.60	314.60
18" deep	BC@1.71	Ea	316.00	61.60	377.60
Stair stringers, steel, pre-cut for 2" x 10" wood treads (without treads)					
32" to 39" stair height	BC@1.71	Ea	91.40	61.60	153.00
48" to 55" stair height	BC@1.71	Ea	115.00	61.60	176.60
56" to 64" stair height	BC@1.71	Ea	128.00	61.60	189.60
65" to 72" stair height	BC@1.71	Ea	144.00	61.60	205.60
73" to 78" stair height	BC@1.71	Ea	198.00	61.60	259.60
81" to 88" stair height	BC@1.71	Ea	215.00	61.60	276.60
89" to 97" stair height	BC@1.71	Ea	230.00	61.60	291.60

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



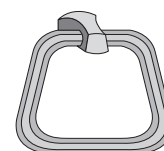
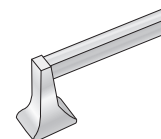
Cup and toothbrush holder, chrome	BC@.258	Ea	11.30	9.29	20.59
Cup holder, porcelain, surface mounted	BC@.258	Ea	7.95	9.29	17.24
Cup, toothbrush & soap holder, recessed	BC@.258	Ea	30.00	9.29	39.29
Cup, toothbrush holder, polished brass	BC@.258	Ea	16.00	9.29	25.29



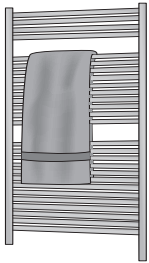
Electrical plates, chrome plated					
Switch plate, single	BE@.154	Ea	4.22	6.01	10.23
Switch plate, double	BE@.154	Ea	5.57	6.01	11.58
Duplex receptacle plate	BE@.154	Ea	4.22	6.01	10.23
Duplex receptacle and switch	BE@.154	Ea	5.57	6.01	11.58

Bathroom Accessories

	Craft@Hrs	Unit	Material	Labor	Total
Grab bars					
Tubular chrome plated, with anchor plates					
Straight bar, 16"	BC@.414	Ea	24.80	14.90	39.70
Straight bar, 24"	BC@.414	Ea	30.00	14.90	44.90
Straight bar, 32"	BC@.414	Ea	32.70	14.90	47.60
"L"- shaped bar, 16" x 32"	BC@.620	Ea	75.70	22.30	98.00
Stainless steel, with anchor plates					
Straight bar, 16"	BC@.414	Ea	37.40	14.90	52.30
Straight bar, 24"	BC@.414	Ea	45.10	14.90	60.00
Straight bar, 32"	BC@.414	Ea	48.90	14.90	63.80
"L"- shaped bar, 16" x 32"	BC@.620	Ea	105.00	22.30	127.30
Mirrors, stainless steel framed, surface mount, no light or cabinet					
16" high x 20" wide	BG@.420	Ea	59.70	14.30	74.00
18" high x 24" wide	BG@.420	Ea	69.40	14.30	83.70
18" high x 36" wide	BG@.420	Ea	106.00	14.30	120.30
24" high x 36" wide	BG@.420	Ea	124.00	14.30	138.30
48" high x 24" wide	BG@.420	Ea	153.00	14.30	167.30
Mirrors, wood framed, surface mount, better quality					
18" x 29" rectangular	BG@.420	Ea	74.10	14.30	88.40
20" x 27" oval, oak	BG@.420	Ea	105.00	14.30	119.30
Robe hook					
Chrome	BC@.258	Ea	22.20	9.29	31.49
Double, solid brass	BC@.258	Ea	21.40	9.29	30.69
Shower curtain rods, chrome plated					
60", recessed	BC@.730	Ea	26.00	26.30	52.30
66", recessed	BC@.730	Ea	28.60	26.30	54.90
Soap holder, surface mounted, with drain holes					
Williamsburg, satin chrome	BC@.258	Ea	52.90	9.29	62.19
Polished brass	BC@.258	Ea	17.30	9.29	26.59
Facial tissue holder, stainless steel, recessed	BC@.258	Ea	35.60	9.29	44.89
Toilet tissue roll holder, chrome, recessed	BC@.258	Ea	16.60	9.29	25.89
Toothbrush holder, chrome, surface mount	BC@.258	Ea	6.14	9.29	15.43
Towel bars, 3/4" round bar					
18" long, chrome	BC@.280	Ea	13.60	10.10	23.70
24" long, chrome	BC@.280	Ea	16.10	10.10	26.20
30" long, chrome	BC@.280	Ea	19.10	10.10	29.20
36" long, chrome	BC@.280	Ea	21.80	10.10	31.90
18" long, solid brass	BC@.280	Ea	44.30	10.10	54.40
24" long, solid brass	BC@.280	Ea	46.60	10.10	56.70
Towel rack, swing-arm, chrome, 3 bars, 12" L	BC@.280	Ea	15.40	10.10	25.50
Towel rings					
Williamsburg chrome and brass	BC@.280	Ea	42.00	10.10	52.10
Williamsburg chrome and porcelain	BC@.280	Ea	40.10	10.10	50.20
Towel shelf, chrome, 24" L with bar below	BC@.280	Ea	39.10	10.10	49.20
Heated towel racks, 16" width, mounted on wall with brackets. Wall plug in or direct connection, 700 watt output. Add for electrical work					
26" high, standard colors	BE@.850	Ea	845.00	33.20	878.20
Add for control panel	BE@.850	Ea	169.00	33.20	202.20
26" high, chrome finish	BE@.850	Ea	2,270.00	33.20	2,303.20
Add for control panel	BE@.850	Ea	194.00	33.20	227.20

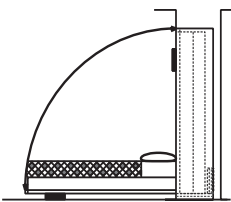


Beds, Folding



	Craft@Hrs	Unit	Material	Labor	Total
35" high, standard colors	BE@1.00	Ea	927.00	39.10	966.10
Add for control panel	BE@1.00	Ea	172.00	39.10	211.10
35" high, chrome finish	BE@1.00	Ea	2,740.00	39.10	2,779.10
Add for control panel	BE@1.00	Ea	198.00	39.10	237.10
44" high, standard colors	BE@1.10	Ea	1,030.00	43.00	1,073.00
Add for control panel	BE@1.10	Ea	187.00	43.00	230.00
44" high, chrome finish	BE@1.10	Ea	3,010.00	43.00	3,053.00
Add for control panel	BE@1.10	Ea	215.00	43.00	258.00
Add for 24" width rack	BE@1.10	Ea	50.00	43.00	93.00
Heated towel rack accessories					
Programmable control panel	BE@.250	Ea	240.00	9.76	249.76
Pull out drying racks	BE@.250	Ea	65.00	9.76	74.76
Robe knobs	BE@.150	Ea	42.00	5.86	47.86
Towel bar accents with standard colors	BE@.150	Ea	85.00	5.86	90.86
Towel bar accents with chrome finish	BE@.150	Ea	115.00	5.86	120.86
Robe knob accents (all styles)	BE@.150	Ea	199.00	5.86	204.86
Tub or shower chairs					
Wall-hung elevated fixed seat	BE@.750	Ea	30.10	29.30	59.40
White adjustable seat	BE@.750	Ea	57.90	29.30	87.20

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



Twin, frames and mechanisms	B1@5.41	Ea	765.00	176.00	941.00
Twin-long, frames and mechanisms	B1@5.41	Ea	765.00	176.00	941.00
Double, frames and mechanisms	B1@5.41	Ea	797.00	176.00	973.00
Double-long, frames and mechanisms	B1@5.41	Ea	797.00	176.00	973.00
Queen, frames and mechanisms	B1@5.41	Ea	829.00	176.00	1,005.00
King, frames and mechanisms	B1@5.41	Ea	934.00	176.00	1,110.00
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	—	—	.75
Mylar	—	SF	—	—	2.50
Xerographic prints					
Vellum	—	SF	—	—	1.00
Erasable vellum	—	SF	—	—	1.25
Mylar	—	SF	—	—	2.50
Enlargements (bond)	—	SF	—	—	.60
Reductions (bond, per sheet)	—	Ea	—	—	2.50

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Practical References for Builders

Steel-Frame House Construction

Framing with steel has obvious advantages over wood, yet building with steel requires new skills that can present challenges to the wood builder. This book explains the secrets of steel framing techniques for building homes, whether pre-engineered or built stick by stick. It shows you the techniques, the tools, the materials, and how you can make it happen. Includes hundreds of photos and illustrations, plus a FREE download with steel framing details and a database of steel materials and manhours, with an estimating program. **320 pages, 8½ x 11, \$39.75**

National Painting Cost Estimator

A complete guide to estimating painting costs for just about any type of residential, commercial, or industrial painting, whether by brush, spray, or roller. Shows typical costs and bid prices for fast, medium, and slow work, including material costs per gallon; square feet covered per gallon; square feet covered per manhour; labor, material, overhead, and taxes per 100 square feet; and how much to add for profit. Includes a CD-ROM with an electronic version of the book with *National Estimator*, a stand-alone *Windows™* estimating program, plus an interactive multimedia video that shows how to use the disk to compile construction cost estimates. **448 pages, 8½ x 11, \$73.00. Revised annually**

Basic Lumber Engineering for Builders

Beam and lumber requirements for many jobs aren't always clear, especially with changing building codes and lumber products. Most of the time you rely on your own "rules of thumb" when figuring spans or lumber engineering. This book can help you fill the gap between what you can find in the building code span tables and what you need to pay a certified engineer to do. With its large, clear illustrations and examples, this book shows you how to figure stresses for pre-engineered wood or wood structural members, how to calculate loads, and how to design your own girders, joists and beams. Included FREE with the book — an easy-to-use limited version of NorthBridge Software's *Wood Beam Sizing* program. **272 pages, 8½ x 11, \$38.00**

Contractor's Guide to QuickBooks 2012



QuickBooks 2012 has many new features that simplify a building contractor's bookkeeping work. You'll wonder how you managed without them. To help you make the most of these new features, or to make getting set up with *QuickBooks* almost painless, this user-friendly manual walks you through *QuickBooks'* detailed setup procedure and explains step-by-step how to create a first-rate accounting system. You'll learn in days, rather than weeks, how to use *QuickBooks* to get your contracting business

organized, with simple, fast accounting procedures. But setting up *QuickBooks* from scratch can be time-consuming. On the free download included with purchase of the book you'll find a *QuickBooks* file preconfigured for a construction company. Open it, enter your company's data, add info on your suppliers, subs and customers, and you're up and running. The setup's done for you. **288 pages, 8½ x 11, \$58.50**

See checklist for other available editions.

Plumber's Handbook Revised

This new edition shows what will and won't pass inspection in drainage, vent, and waste piping, septic tanks, water supply, graywater recycling systems, pools and spas, fire protection, and gas piping systems. All tables, standards, and specifications are completely up-to-date with recent plumbing code changes. Covers common layouts for residential work, how to size piping, select and hang fixtures, practical recommendations, and trade tips. It's the approved reference for the plumbing contractor's exam in many states. Includes an extensive set of multiple-choice questions after each chapter, with answers and explanations in the back of the book, along with a complete sample plumber's exam. **352 pages, 8½ x 11, \$41.50**

Finish Carpentry: Efficient Techniques for Custom Interiors

Professional finish carpentry demands expert skills, precise tools, and a solid understanding of how to do the work. This book explains how to install moldings, paneled walls and ceilings, and just about every aspect of interior trim — including doors and windows. Covers built-in bookshelves, coffered ceilings, and skylight wells and soffits, including paneled ceilings with decorative beams. **276 pages, 8½ x 11, \$34.95**

Construction Estimating Reference Data



Provides the 300 most useful manhour tables for practically every item of construction. Labor requirements are listed for sitework, concrete work, masonry, steel, carpentry, thermal and moisture protection, doors and windows, finishes, mechanical and electrical. Each section details the work being estimated and gives appropriate crew size and equipment needed. Includes a CD-ROM with an electronic version of the book with *National Estimator*, a stand-alone *Windows™* estimating program, plus an inter-active multi-media video that shows how to use the disk to compile construction cost estimates. **384 pages, 11 x 8½, \$39.50**

CD Estimator

If your computer has *Windows™* and a CD-ROM drive, *CD Estimator* puts at your fingertips over 150,000 construction costs for new construction, remodeling, renovation & insurance repair, home improvement, framing & finish carpentry, electrical, concrete & masonry, painting, earthwork & heavy equipment and plumbing & HVAC. Quarterly cost updates are available at no charge on the Internet. You'll also have the *National Estimator* program — a stand-alone estimating program for *Windows™* that *Remodeling* magazine called a "computer wiz," and *Job Cost Wizard*, a program that lets you export your estimates to *QuickBooks Pro* for actual job costing. A 60-minute interactive video teaches you how to use this CD-ROM to estimate construction costs. And to top it off, to help you create professional-looking estimates, the disk includes over 40 construction estimating and bidding forms in a format that's perfect for nearly any *Windows™* word processing or spreadsheet program. **CD Estimator is \$108.50**

Construction Forms for Contractors



This practical guide contains 78 useful forms, letters and checklists, guaranteed to help you streamline your office, run your jobsites, gather and organize records and documents, keep a handle on your subs, reduce estimating errors, administer change orders and lien issues, monitor crew productivity, track your equipment use, and more. Includes accounting forms, change order forms, forms for customers, estimating forms, field work forms, HR forms, lien forms, office forms, bids and proposals, subcontracts, and more. All are also on the CD-ROM included, in *Excel* spreadsheets, as formatted Rich Text that you can fill out on your computer, and as PDFs. **360 pages, 8½ x 11, \$48.50**

Excavation & Grading Handbook Revised

The foreman's, superintendent's and operator's guide to highway, subdivision and pipeline jobs: how to read plans and survey stake markings, set grade, excavate, compact, pave and lay pipe on nearly any job. Includes hundreds of informative, on-the-job photos and diagrams that even experienced pros will find invaluable. This new edition has been completely revised to be current with state-of-the-art equipment usage and the most efficient excavating and grading techniques. You'll learn how to read topo maps, use a laser level, set crows feet, cut drainage channels, lay or remove asphaltic concrete, and use GPS and sonar for absolute precision. For those in training, each chapter has a set of self-test questions, and a Study Center CD-ROM included has all 250 questions in a simple interactive format to make learning easy and fun. **512 pages, 8½ x 11, \$42.00**

Construction Contract Writer

Relying on a "one-size-fits-all" boilerplate construction contract to fit your jobs can be dangerous — almost as dangerous as a handshake agreement. *Construction Contract Writer* lets you draft a contract in minutes that precisely fits your needs and the particular job, and meets both state and federal requirements. You just answer a series of questions — like an interview — to construct a legal contract for each project you take on. Anticipate where disputes could arise and settle them in the contract before they happen. Include the warranty protection you intend, the payment schedule, and create subcontracts from the prime contract by just clicking a box. Includes a feedback button to an attorney on the Craftsman staff to help should you get stumped — *No extra charge. \$99.95.* Download the *Construction Contract Writer* at: <http://www.constructioncontractwriter.com>



Markup & Profit: A Contractor's Guide, Revisited



In order to succeed in a construction business, you have to be able to price your jobs to cover all labor, material and overhead expenses, and make a decent profit. But calculating markup is only part of the picture. If you're going to beat the odds and stay in business — profitably, you also need to know how to write good contracts, manage your crews, work with subcontractors and collect on your work. This book covers the business basics of running a construction company, whether you're a general or specialty contractor working in remodeling, new construction or commercial work. The principles outlined here apply to all construction-related businesses. You'll find tried and tested formulas to guarantee profits, with step-by-step instructions and easy-to-follow examples to help you learn how to operate your business successfully. Includes a link to free downloads of blank forms and checklists used in this book. **336 pages, 8½ x 11, \$47.50**

Standard Estimating Practice

Estimating isn't always an easy job. Sometimes snap decisions can produce negative long-term effects. This book was designed by the American Society of Professional Estimators as a set of standards to guide professional estimators. It's intended to help every estimator develop estimates that are uniform and verifiable. Every step that should be included in the estimate is listed, as well as aspects in the plans to consider when you're estimating a job, and what you should look for that may not be included. The result should help you produce more consistently accurate estimates. **526 pages, 8½ x 11, \$89.00**

Construction Estimating



This unusually well-organized book shows the best and easiest way to estimate materials for room additions or residential structures. It gives estimating tables and procedures needed to make a fast, accurate, and complete material list of the structural members found in wood- and steel-framed buildings. This book is divided into 72 units, each of them covering a separate element in the estimating procedure. Covers estimating foundations, floor framing, wall framing, ceiling framing, roof framing, roofing materials, exterior and interior finish materials, hardware, steel joist floor framing, steel stud framing, and steel ceiling joist and rafter framing. **496 pages, 8½ x 11, \$49.50**

Roofing Construction & Estimating

Installation, repair and estimating for nearly every type of roof covering available today in residential and commercial structures: asphalt shingles, roll roofing, wood shingles and shakes, clay tile, slate, metal, built-up, and elastomeric. Covers sheathing and underlayment techniques, as well as secrets for installing leakproof valleys. Many estimating tips help you minimize waste, as well as insure a profit on every job. Troubleshooting techniques help you identify the true source of most leaks. Over 300 large, clear illustrations help you find the answer to just about all your roofing questions. **448 pages, 8½ x 11, \$38.00**

Craftsman's Construction Installation Encyclopedia

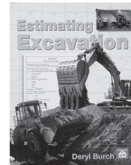
Step-by-step installation instructions for just about any residential construction, remodeling or repair task, arranged alphabetically, from *Acoustic tile* to *Wood flooring*. Includes hundreds of illustrations that show how to build, install, or remodel each part of the job, as well as manhour tables for each work item so you can estimate and bid with confidence. Also includes a CD-ROM with all the material in the book, handy look-up features, and the ability to capture and print out for your crew the instructions and diagrams for any job. **792 pages, 8½ x 11, \$65.00**



Survive & Thrive in Building

Are you ready for the housing rebound? For every home-builder casualty of a housing recession, there's another one still in business. Which will you be? Business owners often learn how to run a successful company the hard way — through trial and error. But you don't have to rely on this haphazard approach to entrepreneurship. As a home builder, you can have behind you the wisdom and experience of NAHB members who have weathered the ups and downs of the housing cycle. This book covers basic, but essential knowledge for running a successful company, whether you're new to residential construction or a veteran builder. You'll learn how to find a sustainable market niche, get financing for your projects, market your homes, achieve an optimal balance between sales volume and profit margin, understand financial reports, organize and insure your company to minimize risk, and find and keep the best employees and trade contractors. **316 pages, 10 x 7, \$39.95. Published by NAHB**

Estimating Excavation



How to calculate the amount of dirt you'll have to move and the cost of owning and operating the machines you'll do it with. Detailed, step-by-step instructions on how to assign bid prices to each part of the job, including labor and equipment costs. Also, the best ways to set up an organized and logical estimating system, take off from contour maps, estimate quantities in irregular areas, and figure your overhead. **448 pages, 8½ x 11, \$39.50**

Concrete Construction

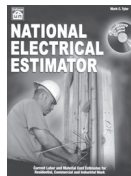
Just when you think you know all there is about concrete, many new innovations create faster, more efficient ways to do the work. This comprehensive concrete manual has both the tried-and-tested methods and materials, and more recent innovations. It covers everything you need to know about concrete, along with Styrofoam forming systems, fiber reinforcing adjuncts, and some architectural innovations, like architectural foam elements, that can help you offer more in the jobs you bid on. Every chapter provides detailed, step-by-step instructions for each task, with hundreds of photographs and drawings that show exactly how the work is done. To keep your jobs organized, there are checklists for each stage of the concrete work, from planning, to finishing and protecting your pours. Whether you're doing residential or commercial work, this manual has the instructions, illustrations, charts, estimating data, rules of thumb and examples every contractor can apply on their concrete jobs. **288 pages, 8½ x 11, \$28.75**

National Building Cost Manual

Square-foot costs for residential, commercial, industrial, military, schools, greenhouses, churches and farm buildings. Includes important variables that can make any building unique from a cost standpoint. Quickly work up a reliable budget estimate based on actual materials and design features, area, shape, wall height, number of floors, and support requirements. Now includes easy-to-use software that calculates total in-place cost estimates. Use the regional cost adjustment factors provided to tailor the estimate to any job-site in the U.S. Then view, print, email or save the detailed PDF report as needed. **264 pages, 8½ x 11, \$63.00. Revised annually**



National Electrical Estimator



This year's prices for installation of all common electrical work: conduit, wire, boxes, fixtures, switches, outlets, load-centers, panelboards, raceway, duct, signal systems, and more. Provides material costs, manhours per unit, and total installed cost. Explains what you should know to estimate each part of an electrical system. Includes a CD-ROM with an electronic version of the book with *National Estimator*, a stand-alone *Windows*™ estimating program, plus an interactive multimedia video that shows how to use the disk to compile construction cost estimates. **552 pages, 8½ x 11, \$72.75. Revised annually**

Estimating Home Building Costs, Revised

Estimate every phase of residential construction from site costs to the profit margin you include in your bid. Shows how to keep track of manhours and make accurate labor cost estimates for site clearing and excavation, footings, foundations, framing and sheathing finishes, electrical, plumbing, and more. Provides and explains sample cost estimate worksheets with complete instructions for each job phase. This practical guide to estimating home construction costs has been updated with digital *Excel* estimating forms and worksheets that ensure accurate and complete estimates for your residential projects. Enter your project information on the worksheets and *Excel* automatically totals each material and labor cost from every stage of construction to a final cost estimate worksheet. Load the enclosed CD-ROM into your computer and create your own estimate as you follow along with the step-by-step techniques in this book. **336 pages, 8½ x 11, \$38.00**

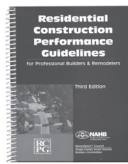


Estimating & Bidding for Builders & Remodelers

This 5th edition has all the information you need for estimating and bidding new construction and home improvement projects. It shows how to select jobs that will be profitable, do a labor and materials take-off from the plans, calculate overhead and figure your markup, and schedule the work. Includes a CD with an easy-to-use construction estimating program and a database of 50,000 current labor and material cost estimates for new construction and home improvement work, with area modifiers for every zip code. Price updates on the Web are free and automatic. **272 pages, 8½ x 11, \$89.50**

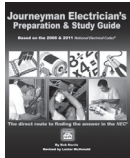
Residential Construction Performance Guidelines, 4th Ed.

Created and reviewed by more than 300 builders and remodelers, this guide gives cut-and-dried construction standards that should apply to new construction and remodeling. It defines corrective action necessary to bring all construction up to standards. Standards are listed for sitework, foundations, interior concrete slabs, basement and crawl spaces for block walls and poured walls, wood-floor framing, beams, columns and posts, plywood and joists, walls, wall insulation, windows, doors, exterior finishes and trim, roofs, roof sheathing, roof installation and leaks, plumbing, sanitary and sewer systems, electrical, interior climate control, HVAC systems, cabinets and countertops, floor finishes and more.



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

Journeyman Electrician's Preparation & Study Guide



This is not only a great study guide filled with sample electrician's exam questions — it teaches you how to quickly turn to the code section that answers the questions. Most electrician's exams give you about 2 minutes per question — not enough time to browse through 800 pages of fine print looking for each answer. This manual, based on the 2008 and 2011 *NEC* editions, explains how the Code is organized, so you understand where the information you need is located. Then it shows how to rearrange and tab your copy of the Code to streamline your search efforts. Next, you learn a step-by-step search procedure, in which you're shown how to analyze the question to determine its subject, know where to look in the index, find the exact article, then turn right to the Code section that answers your question.

96 pages, 8½ x 11, \$34.00

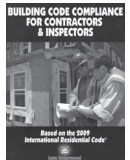
National Home Improvement Estimator

Current labor and material prices for home improvement projects. Provides manhours for each job, recommended crew size, and the labor cost for removal and installation work. Material prices are current, with location adjustment factors and free monthly updates on the Web. Gives step-by-step instructions for the work, with helpful diagrams, and home improvement shortcuts and tips from experts. Includes a CD-ROM with an electronic version of the book, and *National Estimator*, a stand-alone *Windows*™ estimating program, plus an interactive multimedia tutorial that shows how to use the disk to compile home improvement cost estimates.



544 pages, 8½ x 11, \$73.75. Revised annually

Building Code Compliance for Contractors & Inspectors



An answer book for both contractors and building inspectors, this manual explains what it takes to pass inspections under the 2009 *International Residential Code*. It includes a code checklist for every trade, covering some of the most common reasons why inspectors reject residential work — footings, foundations, slabs, framing, sheathing, plumbing, electrical, HVAC, energy conservation and final inspection. The requirement for each item on the checklist is explained, and the code section cited so you can look it up or show it to the inspector. Knowing in advance what the inspector wants to see gives you an (almost unfair) advantage. To pass inspection, do your own pre-inspection before the inspector arrives. If your work requires getting permits and passing inspections, put this manual to work on your next job. If you're considering a career in code enforcement, this can be your guide-book.

8½ x 11, 232 pages, \$32.50

National Repair & Remodeling Estimator

The complete pricing guide for dwelling reconstruction costs. Reliable, specific data you can apply on every repair and remodeling job. Up-to-date material costs and labor figures based on thousands of jobs across the country. Provides recommended crew sizes; average production rates; exact material, equipment, and labor costs; a total unit cost and a total price including overhead and profit. Separate listings for high- and low-volume builders, so prices shown are specific for any size business. Estimating tips specific to repair and remodeling work to make your bids complete, realistic, and profitable. Includes a CD-ROM with an electronic version of the book with *National Estimator*, a stand-alone *Windows*™ estimating program, plus an interactive multimedia video that shows how to use the disk to compile construction cost estimates.



504 pages, 8½ x 11, \$73.50. Revised annually

Green Building Strategies: From Plan to Profit

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Insurance Restoration Contracting: Startup to Success



Insurance restoration — the repair of buildings damaged by water, fire, smoke, storms, vandalism and other disasters — is an exciting field of construction that provides lucrative work that's immune to economic downturns. And, with insurance companies funding the repairs, your payment is virtually guaranteed. But this type of work requires special knowledge and equipment, and that's what you'll learn about in this book. It covers fire repairs

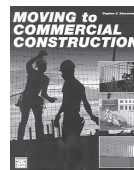
and smoke damage, water losses and specialized drying methods, mold remediation, content restoration, even damage to mobile and manufactured homes. You'll also find information on equipment needs, training classes, estimating books and software, and how restoration leads to lucrative remodeling jobs. It covers all you need to know to start and succeed as the restoration contractor that both homeowners and insurance companies call on first for the best jobs. **640 pages, 8½ x 11, \$69.00**

Pipe & Excavation Contracting Revised

This popular manual has been updated and improved to bring it more current with modern earthmoving and trenching equipment, refined excavation techniques, stricter safety rules, and improved materials. Shows how to read plans and compute quantities for both trench and surface excavation, figure crew and equipment productivity rates, estimate unit costs, bid the work, and get the bonds you need. Learn how to choose the right equipment for each job, use GPS, how to lay all types of water and sewer pipe, work on steep slopes or in high groundwater, efficiently remove asphalt and rock, and the various pipe, joints and fittings now available. Explains how to switch your business to excavation work when you don't have pipe contracts, and how to avoid the pitfalls that can wipe out your profits on any job. **328 pages, 8½ x 11, \$35.00**



Moving to Commercial Construction



In commercial work, a single job can keep you and your crews busy for a year or more. The profit percentages are higher, but so is the risk involved. This book takes you step-by-step through the process of setting up a successful commercial business: finding work, estimating and bidding, value engineering, getting through the submittal and shop drawing process, keeping a stable work force, controlling costs, and promoting your business.

Explains the design/build and partnering business concepts and their advantage over the competitive bid process. Includes sample letters, contracts, checklists and forms that you can use in your business, plus a CD-ROM with blank copies in several word-processing formats for both Mac™ and PC computers. **256 pages, 8½ x 11, \$42.00**

Visual Handbook of Building and Remodeling

If you've ever had a question about different types of material, or the dimensions required by Code in most installations — you'll find the answers quickly and easily in this 632 page illustrated encyclopedia. This expanded third edition of the classic reference includes the latest Code information, new full-color drawings, and a new section on making homes green. 1,600 full-color drawings provide a clear look at every aspect of home construction and systems, to visualize exactly how to tackle any building project or problem. There are charts, dimensions, and illustrations on design, site and climate, masonry, foundations, wood, framing, sheathing, siding, roofing, windows and doors, plumbing, wiring, the thermal envelope, floors, walls and ceilings, storage, heating, cooling, passive solar, lighting, sound, and more. **632 pages, 8½ x 11, \$29.95**

National Renovation & Insurance Repair Estimator



Current prices in dollars and cents for hard-to-find items needed on most insurance, repair, remodeling, and renovation jobs. All price items include labor, material, and equipment breakouts, plus special charts that tell you exactly how these costs are calculated. Includes a CD-ROM with an electronic version of the book with *National Estimator*, a stand-alone *Windows™* estimating program, plus an interactive multimedia video that shows how to use the disk to compile construction cost estimates.

488 pages, 8½ x 11, \$74.50. Revised annually

Profits in Buying & Renovating Homes

Step-by-step instructions for selecting, repairing, improving, and selling highly profitable "fixer-uppers." Shows which price ranges offer the highest profit-to-investment ratios, which neighborhoods offer the best return, practical directions for repairs, and tips on dealing with buyers, sellers, and real estate agents. Shows you how to determine your profit before you buy, what "bargains" to avoid, and how to make simple, profitable, inexpensive upgrades. **304 pages, 8½ x 11, \$24.75**

Code Check Complete, 2nd Edition

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