Estimating Rules of Thumb

by Allen Matz

These pricing shortcuts will improve estimating speed without sacrificing accuracy

Ask two estimators to take off and price a specific item on a plan, and most times the takeoffs will be different. Both may be correct and even usable, but every estimator has tricks and shortcuts that affect the way the estimate comes out. After 18 years of estimating residential jobs, here are some of the methods that work for me.

Different Levels of Accuracy

The estimates I do are for pricing construction, not for materials purchase. Therefore, I don't get too hung up on what's called neat, or precise, estimating. If you're estimating $150-per-square-foot granite for a countertop, you need to be as precise as you can. But if you're calculating the concrete for a foundation footing that will be poured on less than perfectly level ground, and the estimate is for the bank loan, then you can use what I refer to as "regular" or what some estimators call "quick" estimating.

There are times to estimate quickly and times to do it neatly, but you should be consistent so your historical data can be used for job-costing and to adjust future estimates.

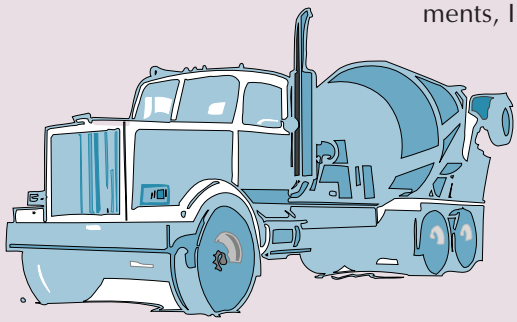
A word about waste. I've never understood why some estimators go to the *n*th degree in precision when doing a takeoff and then add in a seemingly arbitrary percentage to cover waste and errors. For "quick" estimating, I try to incorporate the waste factor directly into the initial number, rather than do several calculations. For example, when figuring drywall square footage, the amount of board taken up by windows and doors usually covers the waste. (I say "usually" because if you've got a 16x7-foot garage door or

CONCRETE FOUNDATIONS

We usually sub out concrete on a per-yard basis, so the trick I use to calculate yardage is to imagine the concrete foundation wall as a concrete slab standing on edge: The thickness of the slab equals the width of the wall. The wall height is easily taken from the plans and the wall length is the total of all the foundation sides.

For example, a simple 8-inch-thick rectangular foundation wall measuring 25x40 feet has a total length of 130 linear feet. If the wall is 8 feet high, then the total square footage of the wall is 130 x 8 = 1,040 square feet. According to the concrete estimating chart I use (at right), one cubic yard of concrete will cover 40 square feet of an 8-inch-thick slab. So I just divide 1,040 square feet by 40 square feet per yard to arrive at 26 cubic yards of concrete for the wall.

If there are lots of windows and doors, you may want to take out the square footage for them and then add in a waste factor. In simple basements, I leave in the footage from the windows to cover the waste.



Since the concrete table calculates yardage on slabs up to 18 inches thick, footings can be calculated the same way as walls.

Coverage of One Cu. Yd. Concrete

Thickness	Square Feet
18"	18
12"	27
11"	29 1/2
10"	32
9"	36
8"	40
7"	46
6"	54
5"	65
4"	81
3 1/2"	93
3"	108
2 1/2"	130
2"	162
1 1/2"	216
1"	324

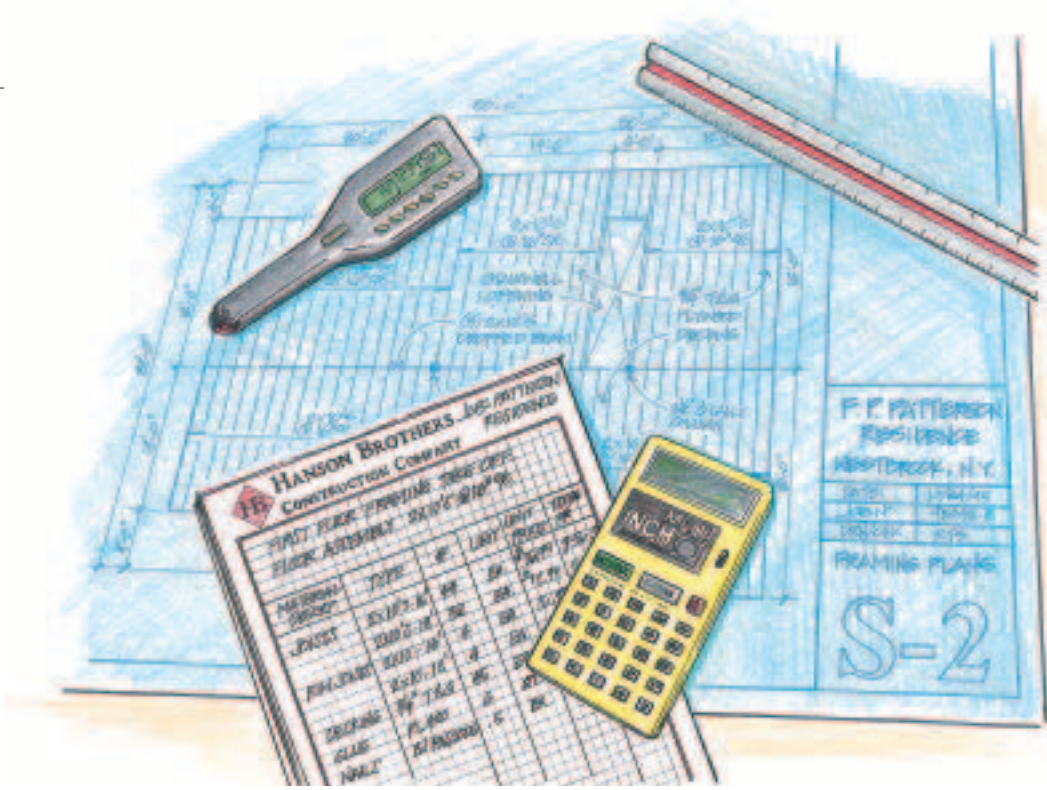
Find the thickness of the wall or footing in the first column to determine the number of square feet (second column) covered by one cubic yard of concrete.

an entire window wall, you'll have to subtract square footage to avoid too much waste.)

Efficient Estimating

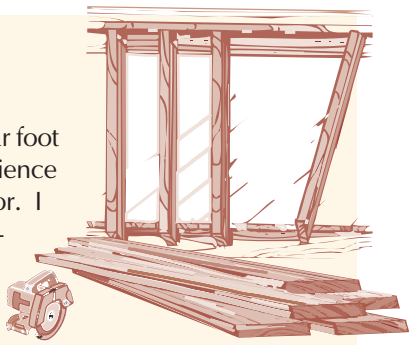
I try to work as efficiently as possibly when I estimate. I gather up the plans, a couple of sharp pencils, a scale, an electronic ruler, and a calculator. I go to a room with a large table, shut the door, and don't answer the phone. Occasionally, I may call out to check with a subcontractor on a detail or construction method, but that's it.

I keep the paperwork organized and simple. Each task gets a separate sheet of paper from a legal pad. I write with pencil because it can be easily erased. I know I'll need to make revisions, and a clean takeoff sheet lets me quickly see how I arrived at certain amounts when I look at it weeks later.



Notice that I haven't mentioned the computer — yet. Only when I've finished estimating, when I've made all my calls to suppliers and subs, and when I've clearly marked all my totals, do I return to my desk and enter all the data at once into a spreadsheet template on my computer. It's fun to see the bottom line change as you enter data during a takeoff, but for me it's not worth the effort it takes to change gears from pad and paper to computer. Delaying computer entry to the very end when I have all accurate numbers saves a lot of time.

FRAMING



Most framing subcontractors bid their labor by the square foot of finished living space, and contract on either a "turnkey" (one price for everything) or labor-only basis. On a turnkey job, the framing contractor will take off and purchase all of the lumber, exterior trim, and even the trusses. But if you are subcontracting only for framing labor, then you'll need a lumber takeoff. This can be done in house, by a lumberyard, or by your framing contractor (probably for a fee, since he won't be handling and marking up the lumber). Completing an accurate lumber takeoff is beyond the scope of this article, but I'll offer a few tips for quick estimating.

Wall plates. I order plate material at least four and sometimes five times the total length of all walls. Walls need three plates running the length of each wall section. On walls that run in the same direction as the trusses or joists, an additional plate is needed for drywall backing at the ceiling. More will be needed to cover waste, miscellaneous backing, and continuous fire blocking for walls over 8 feet high.

Studs. Typically, wall studs are 16 inches on-center. It follows then that the number of studs per foot should be about 12/16, or three-fourths, the total wall length. But with braces, trimmers, corners, partition channels, and cripples, you'll have to adjust upward.

I use one stud for each linear foot of wall, but your own experience may suggest a different factor. I know one framing subcontractor who uses 1.25 studs for each foot of wall length.

Subfloor. I've seen subflooring taken off many different ways. One lumberyard simply divides the square footage of the floor by 32 and uses that value for the number of plywood sheets. Another squares off any jogs or cantilevers from the entire outside perimeter to form one large rectangle, then takes that square footage and divides by 32.

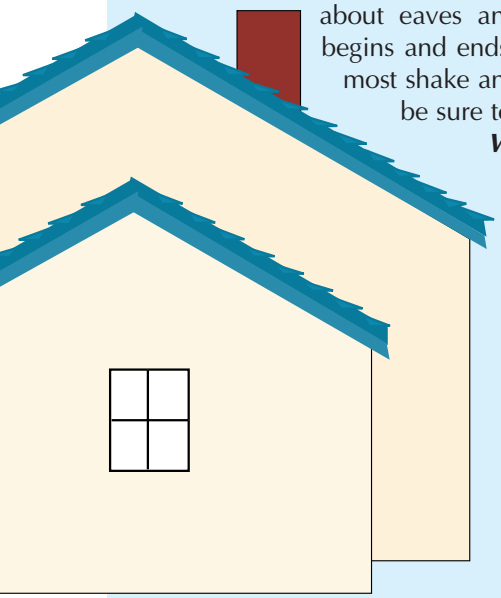
These are both adequate "quick" approaches, but in the case of plywood, neither approach is "neat" enough for me. This is one area where I typically use a more careful approach: I roll out the prints and pencil in the plywood sheets, drawing parallel lines every 4 feet to scale, then breaking the sheets every 8 feet, allowing for staggered joints. I then count up full and half sheets to get a total. I add in one or two extra sheets for miscuts and bad pieces to make sure there's always enough to cover the floor. If the two extra sheets aren't used on that floor, they'll be used during framing pickup or on the second floor.

ROOFING

There are two main things to consider when estimating roofing: the adjustment of the coverage area due to the roof pitch — the steeper the roof the greater the increase — and the waste factor.

Adjustment factor. The table at right gives adjustment factors for different roof pitches. For example, if the horizontal area under the roof is 2,000 square feet and the roof pitch is 5/12, then the actual area to be covered equals 2,000 X adjustment factor, 1.083, or 2,166 square feet. The adjustment factors work for all types of roofs, whether straight gable, hip, or a combination.

When measuring the area to be roofed, don't forget about eaves and gable overhangs. The roof actually begins and ends at the overhangs. Remember also that most shake and shingle roofs need a starter course, so be sure to add that to the estimate.



Waste factor. Because waste factors vary widely by roofing type, it's wise to check with roofing contractors in your area to get what they consider to be an accurate waste factor for each roofing type. The roofer who coached me adds anywhere from 5% to 13% waste, depending on shingle type.

Using the example above, a waste factor of 13% applied to the adjusted 2,166 square feet of roof gives 2,448 square feet or 24.5 squares of material needed to cover that 2,000-square-foot area.

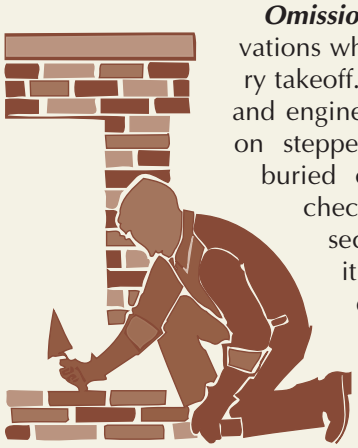
Roof Slope Adjustment Factors

Roof Slope	Adjustment Factor
1 in 12	1.003
2 in 12	1.014
3 in 12	1.031
4 in 12	1.054
5 in 12	1.083
6 in 12	1.118
7 in 12	1.158
8 in 12	1.202
9 in 12	1.250
10 in 12	1.302
11 in 12	1.357
12 in 12	1.414

First calculate the horizontal area covered by the roof (including overhangs), then multiply by the correct adjustment factor to arrive at roof coverage area.

EXTERIOR MASONRY

A rule of thumb for modular brick veneer is "3 bricks equals 8 inches." That means 3 bricks will cover 8x8 inches, or 64 square inches, which translates to 6.75 bricks per square foot. But I use 7 bricks per square foot when calculating a brick count. Using the whole number 7 is easier on the arithmetic and also covers some of the waste.

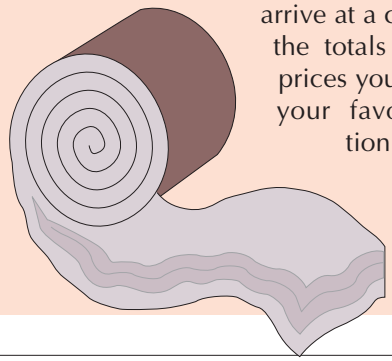


Omissions. Don't rely solely on elevations when doing a brick or masonry takeoff. Check both the foundation and engineering plans for information on stepped-down brick ledges and buried courses. Similarly, by not checking the end elevations and sections through the building, it is easy to miss courses that extend up to the underside of a sloped soffit.

INSULATION

Insulation is estimated by the square foot of floor, wall, or ceiling. If the outside walls are 140 linear feet and the walls are 8 feet high, then you'll need 1,120 (140 x 8) square feet of the specified insulation. Since there is very little waste in insulation, I take the time to subtract the window and door areas from the total. Remember also to add in the rim joist, or box sill, insulation to the total.

For the ceiling, the area to be insulated is the same as the finished floor area. To arrive at a cost, multiply the totals by installed prices you obtain from your favorite insulation contractor.



DRYWALL

I first learned to do drywall takeoffs by adding wall areas and ceiling areas and dividing that total by 48 to get the number of 4x12 sheets of drywall.

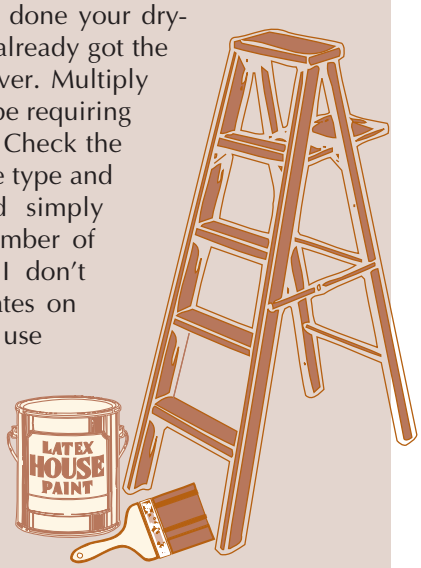
Board formula. Later, an old drywaller who probably invented gypsum gave me a "board" formula that I still use. Multiply the square footage of the finished area of the house by 4.5 for the house total. If the garage is full-finish, multiply its square footage by 2.25 and then add the result to the house amount. Divide by 48 to get number of sheets. For partially rocked garages, adjust the 2.25 number downward.

Quick ratio. No matter which method you use, sheet takeoff or board formula, the ratio of drywall board feet to finished square feet, including garage, should be between 3.0 and 3.5. This ratio may begin to fail on houses with large rooms, as there are not as many walls to cover when the rooms are large. But the ratio is a good check on your calculations.

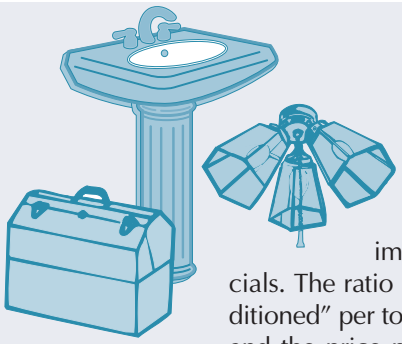
PAINTING

Most painters bid by the square foot. I've received many painting bids over the phone by simply describing the interior (for example, doors and woodwork all painted or all stained) and the exterior of the house (stucco, hardboard siding, or brick) to the painting contractor and getting his square-foot price on that type of house.

If you are hiring a labor-only painter, you will need to know how many gallons it takes to cover everything. If you've done your drywall takeoff, you've already got the area you need to cover. Multiply it by 2, or 3 if you'll be requiring more than one coat. Check the coverage rates for the type and brand of paint and simply divide to get the number of gallons. As a rule, I don't trust the coverage rates on the can. I always use two-thirds to three-fourths of what the container says a gallon will cover.



MECHANICALS



Plumbing, heating, and electrical costs are best estimated from historical unit costs. But the estimator needs to be aware that unit costs are average costs and therefore very sensitive to fixture quality and quantity.

Plumbing. I've tried to force a square-foot price onto plumbing quotes with little success. It's best to have a plumber bid the job turnkey, but in a pinch a "price per trap" works. Every plumbing fixture needs at least one trap, while the kitchen sink needs two because of the dishwasher. The washer hookup counts as one and the floor drain in the basement floor also counts as one.

To use historical data to determine a price per trap, you need only divide the total plumbing cost for the house by number of traps. The more houses you figure this way, the better your unit price will be.

Heating. In the southern and western parts of the country, where I work, the heating load is determined by the cooling load. Each region has a ratio that is either implied or dictated by the local building officials. The ratio states how many square feet can be "conditioned" per ton of cooling. If the ratio is 600 feet per ton and the price per ton of cooling is $750, then the heating/cooling costs for an 1,800-square-foot house is 1,800/600 x $750, or $2,250.

Electrical. Electrical costs can also be estimated by the square foot, although you probably won't find many electrical contractors willing to tell you their unit costs. In fact, heating and electrical costs are usually very close unless special conditions prevail, such as lots of recessed lights, jetted tubs or spas, or an oversized electrical panel. As with plumbing, your own analysis will tell you what square-foot prices work in your area. ■

Allen Matz has been involved with residential construction for more than 18 years, both in the field and in the office. He is currently a purchaser for a Denver, Colo., home builder.