ICFHome.ca
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ICFhome.ca
http://buildesontario.com
206 Desroches Trail
Tiny, Ontario, L9M 0H9
info@icfhome.ca
Tel: 866 868-6606

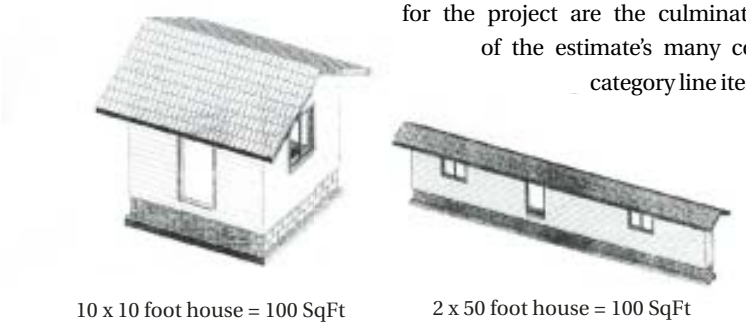
The Myth & Math of Cost per Square-Foot

No contractor wants to talk to customers about square-foot cost. But the topic will inevitably arise, because everything about planning a construction project — especially a new home — leads the customer to think in terms of cost per square foot.

When customers buy a set of stock plans, it says right there on the prints how many square feet the project involves. If they hire an architect, they begin by telling him or her how many feet they need and what they want to spend — and, naturally, they assume there's a linear relationship between square feet and cost.

The purpose of this article is twofold: first, to explain how to think about square-foot costs yourself; and second, how to explain them to the customer in such a way that you can still get the job.

Educating the customer on this topic is part of your job, and you may need to do it more than once during a project. For example, whenever I quote a cost-per-square-foot range to a potential customer, he nearly always forgets the high number and fixes his mind on the lower one, thinking, "That's what my house will cost." I have to remind him that the production costs for the project are the culmination of the estimate's many cost-category line items.



10 x 10 foot house = 100 SqFt
(40 lft footprint)

2 x 50 foot house = 100 SqFt
(104 lft footprint)

The walls and foundation of the house on the right contain 2.6 times as much material as the walls and foundation of the one on the left.

Figure 1. It's unlikely that anyone would build a 2-foot-by-50-foot house — or even a 10-foot-by-10-foot one — but examples like this are useful in explaining to customers why two houses with the same square footage can cost radically different amounts.

In other words, final price depends not only on a building's size, but also on the house's geometry, the level of architectural detail, and the lot conditions.

Geometry, Layout, Volume

Certainly the shape of a house has much to do with what it costs to build. To get this point across to customers, I make an exaggerated comparison between two structural footprints that vary in geometric form but not in size. Both represent structures that measure 100 square feet (see Figure 1). Building Footprint A is a 10-foot-by-10-foot box. Building Footprint B is a 2-foot-by-50-foot elongated rectangle.

Based on an estimating tabulation summary, Building A has a 40-foot perimeter, which requires 40 feet of excavation, footings, stem walls, exterior wall framing, roof framing, wall sheathing, siding, soffit, fascia, exterior paint, insulation, drywall, interior paint, and baseboard. Building B, by contrast, requires 104 lineal feet of those same items. That's 260 percent more than — or 2.6 times — the amount of labor and materials needed by Building A. (Both structures, it's assumed, have the same roof area of 100 square feet, not including overhangs and pitch).

This example demonstrates quite clearly that the cost to construct or remodel each of these two buildings differs radically, despite their equivalent square footage.

A more realistic example. Once clients have absorbed this lesson, I show them a more real-world example involving two distinctly different homes with the same 3,850 square feet of livable area Figure 2, next page . The first home has six outside walls and a simple roof form. The second has many more walls — some curved — and a correspondingly more complicated roof.

Communicating these concepts to customers with words alone is difficult, so it's important to show them drawings. With illustrations to refer to, it's much more likely they'll understand what you're explaining — and agree with your conclusions. And if at some later date the customer asks why something costs so much, you can refer back to the drawings and remind them that

when something is complicated it costs more to build.

Added cost for cathedral. One popular detail that costs a lot more than people think is cathedral ceilings. I use a drawing to explain this concept to customers too. It shows two houses with identical footprints; one has flat ceilings and the other vaulted (Figure 3, next page). In my experience — and I have the job-costing to prove it — the shell of a house costs 40 percent more to produce when all the rooms have cathedral ceilings.

How can this be? Well, sloping the ceilings affects framing, electrical wiring, insulation, drywall, painting, and — most significantly — hvac ducting. In a flat-ceiling home, all the ductwork can be run through the attic; if the ceiling is vaulted, that may not be an option. To house the ducts, you may have to frame in a soffit or bury them under a slab. And without the possibility of collar ties, you may have to use scissors trusses or a bearing ridge.

So if the customer suddenly says, "Hey, we want to change all the ceilings (or just one of them) to cathedral," don't be foolish enough to give him a price off the top of your head. Go back to the office and estimate what the change will really cost based on its impact on all the elements described here.

Effect on schedule. When you're figuring out how much extra to charge for vaulted ceilings — or for anything else that increases the volume of the building — don't look at just the material and labor. Think about the schedule. With more volume to build and finish, the project might take longer to complete; if you don't factor in added overhead, you'll have to eat that cost yourself.

The old adage "time is money" really does apply here!

Livable Square Footage Vs. Total Under Roof

Customers tend to perceive cost per square foot as referring only to livable square-footage area. To them, garages, basements, porches, and attics are not part of the equation and should be practically free. In earlier times, when houses were simpler and garages were smaller, these areas probably *didn't* cost very much. Today, though, they're much larger and include all kinds of amenities.

What are the most expensive rooms in a house on a per-square-foot basis? Typically the kitchen, master bath, and family room, because they contain more plumbing and wiring and pricier finish materials than other rooms. But if you include the cost of the shell, the cost differences between various parts of a home are less than you might think.

Garage vs. bedroom. Most customers expect to pay more for a larger bedroom — but not for a larger garage. Yet in most cases, the two finished spaces are more similar than they are different: Both have footings, stem walls, floors, framing, windows, wiring, and drywall. Bedrooms have interior-finish items like carpeting, closet trim, closet doors, a bedroom door, base, and casing. Garages lack floor coverings and closets but have overhead doors, door openers, 5/8-inch Type X drywall, a fire-rated door to the house, and a side door to exit the building.

If you make a comparison between bedrooms and garages based on how much they actually cost per square foot to build, you'll find they aren't that far apart. Assuming both areas are built slab-on-grade, my job-costing from past projects has shown them to be nearly identical (within 2 percent) in cost per square foot.

This is something you may need to communicate to customers — and you should definitely be aware of it yourself, so you don't end up giving garage space away.

Price perception. Because customers can't stop themselves from thinking in terms of cost per square foot, I have found it useful to counter by thinking in terms of the total area under roof.

A few years back I built someone a new home for $785,400. It had 3,850 square feet of livable area and a 750-square-foot three-car garage. It was a much easier sell when I quoted the customer a $171-per-square-foot cost ($785,400 ÷ [3,850 + 750]) for total under roof than it would have been had I quoted him a $204-per-square-foot cost ($785,400 ÷ 3,850) for livable space.

There's nothing dishonest about this. The cost to the customer is the same either way — and it's unrealistic to pretend that areas that aren't livable have no cost.

How can these two homes be anywhere near the same cost to produce?

Figure 2. Showing clients the footprints of simple and complex houses with the same square footage can help make the point that this measurement is not the only determinant of cost.

Add Space for Less

As someone who is serious about job-costing, I have a good sense of what my

projects actually cost to build.

Consider the production costs of two spec houses I built on flat lots in the same subdivision with similar exterior details and rooflines. The homes had identical kitchens, master baths, and 900-square-foot three-car garages. One home was 3,500 square feet (livable) and was built for a cost of $868,000. The other was 4,500 square feet (livable) and cost $935,000 to build. Does this make sense? How can the home that's 1,000 square feet larger cost only $67,000 ($67 per square foot) more?

The answer is simple. The 3,500-square-foot floor plan was expanded to 4,500 square feet. The added space was a two-story "cube" with 500 square feet per floor. By the time we built the second home, the production costs for the expensive areas were known, because we had built the original version of the plan before. The added space was inexpensive because, like the theoretical 10-foot-by-10-foot house discussed at the beginning of this story, the cube contained minimal added material and labor.

2,800 SqFt: Flat Ceilings

2,800 SqFt: Vaulted Ceilings

Figure 3. Adding cathedral ceilings significantly increases the cost of the shell. These houses are identical except that one has flat ceilings and the other vaulted. It's clear from the drawing that vaulted ceilings require more material in the interior partition walls. (They also require more labor.) What's less obvious is the increased structural complexity and the need to run ducts somewhere other than in the attic.

Of course, when we put the house on the market, customers did not distinguish between the expensive and inexpensive space, so the added rooms greatly increased our profit on the project. This is a tried-and-true method for making money: Know what square footage sells for and figure out a way to build it for less than that.