What Is the Cost

A 25-year veteran of the housing industry with a focus on building and operations performance makes the case for investing in good quality up front instead of paying for bad quality later

By Glenn Cottrell

I hear and read all the time that you can't quantify quality. It's an ethic, not a number; an abstract goal that doesn't show up on the budget. Quality is in the eye of the beholder.

To be fair, there's no consensus about the definition of the word *quality* in the housing industry, running the gamut from callbacks to the customer experience. As such, there's no standard or formula, to place a dollar amount on quality. Until now.

That number is $4,919.

This is the amount that Theresa Weston, Ph.D., a senior research fellow at DuPont Building Innovations, found to be the average amount set aside per house by 13 publicly traded home builders to cover the cost of warranty work. Add construction defect litigation and that per-house reserve balloons to $22,278. Once I got over the shock of those figures, I decided to do something about it. I wanted to address our industry's penchant for paying out huge sums of money for substandard work, on the front end (the cause) and the back end (the effect). If builders are so willing to throw good money after bad, maybe it's for lack of a different model. Or any model.

I envisioned a road map that enabled builders to objectively measure the key metrics of construction excellence to the point of their respective and collective budget impact … and then address inefficiencies (read: unnecessary costs) until a moderate investment in good quality wiped away the excessive expense of poor quality. I wanted a way for builders to understand what they spend and why.

We call that road map and formula The Cost of Quality.

AN ATTRACTIVE RETURN

Let's get right to it: What if I said you could save more than $7,200 per house by investing $1,200 up front in delivering better quality? You heard me: a 600 percent return. Maybe a little less, maybe a little more, and likely not all at once, but certainly better than breakeven. Multiply that number by your annual closings and it probably looks pretty attractive, or at least good enough to keep reading.

To get there, we needed to define quality and its costs. My team and I scoured industry sources for data, finding enough pieces from NAHB's annual "The Cost of Doing Business Study," the "New Home & Building Materials Warranty Report" from the Warranty Week website, and customer satisfaction correlations from Avid Ratings, among others, to start filling in the puzzle.

Those references also helped us create a builder profile for benchmarking purposes as we fleshed out the formula (see The Benchmark Builder, opposite). We then brainstormed 29 metrics, from rework to customer referrals, and sorted them into eight buckets: Value Engineering, Jobsite Waste, Construction Oversight, Cycle Time, Cost Overruns, Employee Satisfaction, Customer Engagement, and Warranty.

For each of those buckets, we defined the parameters and added a Cost of Quality measure—for example, the bottom-line impact of a 1 percent increase in overall customer satisfaction or a 0.5 percent reduction in hard costs. Then we dug deeper, initially surveying 21 production builders representing nearly 10 percent of all new-home closings in 2014, to establish a baseline for each metric and for others, such as the average new-home sales price, percentage of revenue spent on construction, and budget slippage (see Baselines, on page 44).

At that point, we felt ready to plug in the numbers and do some math, taking a decidedly pragmatic approach bordering on self-doubt and cynicism. When a number came up rosy, we lopped off a percentage just to be safe or looked for ways to discredit it. When we made assumptions, we solicited sanity

PHOTO: ISTOCK

# of Quality?

THE BENCHMARK BUILDER

A real formula requires a real builder—or at least a conglomerate of one that's relatable to most production builders. Based on NAHB's 2013 Housing Economic Study, we conjured this guy:

Annual housing starts	**500**
Average house size (square feet)	**2,600 sf**
Average sales price	**$400,000**
Land (**18.6%**)	**$75,000**
Construction (**61.7%**) Hard costs only	**$246,000** $230,000
Financing (**1.4%**)	**$5,000**
General & Administrative (**4.3%**)	**$17,000**
Sales and marketing (**4.7%**)	**$19,000**
Profit (**9.3%**)	**$37,000**
Employees	**120**

checks from our production builder clients. In the end, we felt confident in the formula and the results.

THE 600 PERCENT COMMITMENT

While the Cost of Quality road map flips the script from back-end reserves to up-front investments in quality with attractive returns, it's only a guide. Making the assumptions a reality takes work, and likely will disrupt your operations, accounting, and comfort with the status quo.

Those are real risks, but consider the alternative: If you don't have every single aspect of quality defined for your company, someone—including customers and regulators—will set it for

BASELINES

To make it work, and make it real, the Cost of Quality formula needs a baseline of various costs and percentages that relate to its eight quality metrics. The 21 builders we initially surveyed—ranging from 250 to more than 5,000 closings in 2014—generously provided those financial details, from which we created non-weighted averages to help calculate quality.

	AVERAGE	HIGH	LOW
Average sales price	$330,000	$475,000	$196,000
% of revenue of hard construction costs	57%	81%	40%
Average number of dumpsters per home	2.29	5	1
Average haul fee per dumpster	$380	$735	$100
Low-end site manager salary + benefits	$64,000	$85,000	$45,000
High-end site manager salary + benefits	$95,500	$130,000	$76,500
% turnover among site managers per year	10.5%	20% or more	5% or less
Average number of homes per site manager	15.1	45	5
Spend per house on third-party inspections	$285	$500+	>$200
Cost slippage ($ over budget) per house	$1,844	$7,000	$50
Variance to hard costs	1.06%	3.5%	0%
Target cycle time (working days)	89.5	135	55
Actual cycle time (working days)	101 (+11.5)	152 (+17)	55 (0)
"Dry runs" (working days)	2.9	5+	>1
No. of legitimate warranty service items per home after closing	5.1	<10	>2

you. It is incumbent on builders to set expectations, manage them, and deliver on them. Doing so, however, doesn't require more "quality checks" during construction. In fact, the formula calls for fewer internal inspections, not more of them.

That's because there are smarter investments to ensure accountability: educating subs on your standards and holding them accountable. The result, we've found, reduces internal inspections, cycle time, and rework costs, each of which has an impact on the bottom line.

Another cost—one that builders notoriously and historically miss—relates to setting and managing customer expectations. "In some areas, we have to use plastic plumbing pipes, and homebuyers may not see that as equal or better quality (to metal)," says Doug Campbell, VP of customer care for CalAtlantic Homes' Southern California division, adding, "We have to show confidence in changes that add value and share that expectation with the homeowners"—or suffer potential backlash, financially and otherwise, after occupancy.

Those experiences speak to where builders start down the Cost of Quality path. While our calculations pencil out to $7,250 in total savings across the eight categories (see How We Got There, opposite), your math will vary depending on your costs, efficiency assumptions, and other factors, including your comfort level.

But here's the thing (and it really doesn't matter where you start): Once preventive quality becomes your new normal, your initial investment can pay even greater dividends. "A focus on quality becomes a desire to constantly want to improve your company because you're invested in it," says Jasen Torbett, operations manager for Shea Homes' San Diego division. "It feeds on itself." **PB**

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PHOTOS: ISTOCK

HOW WE GOT THERE

The Cost of Quality formula is designed to find and exploit opportunities for greater efficiencies among eight key metrics to do better in terms of construction performance, costs, and time. It applies to any builder of any size. Feel free to strip away our assumptions and plug in your own numbers to calculate a proprietary cost of quality.

METRICS AND FORMULAS	IMPROVEMENT(S)	IMPACT
Value Engineering		
$330,000 (avg. sales price) x 57% (avg. hard costs as % of revenue) x % reduction in hard costs (improvement)	1% reduction in hard costs	$1,880
Jobsite Waste		
$380 (avg. haul fee per dumpster) + $400 (avg. value of usable materials thrown away per dumpster) x no. of fewer dumpster hauls (improvement)	Reduce waste to save one dumpster haul per home	$780
Construction Oversight		
40 (no. of site managers) x % increase in homes carried (improvement) x $79,750 (avg. site manager salary + benefits) ÷ 500 (no. of homes delivered annually)	15% increase in homes carried per site manager	$955
PLUS $285 (avg. spent per home in third-party "quality" inspections) x % reduction in third-party inspections (improvement)	33% reduction in third-party inspections	$95
Cycle Time		
$650 (avg. daily carry costs) x no. of fewer construction days (improvement) PLUS $200 (avg. daily working capital leverage) x no. of fewer construction days (improvement)	1 day reduction in construction cycle time	$850
Cost Overruns		
$1,844 (avg. cost variance per home) x % reduction in cost variance (improvement)	10% reduction in cost variance	$185
PLUS $330,000 (avg. sales price) x 57% (avg. hard costs as % of revenue) x % reduction in hard costs (improvement)	0.5% reduction in hard costs	$940
Employee Satisfaction		
40 (no. of site managers) x % reduction in turnover (improvement) x $68,450 (avg. site manager salary + benefits) x 125% (avg. replacement costs as % of salary) ÷ 500 (no. of homes delivered annually)	5% reduction in site management turnover	$340
Customer Engagement		
5.1 (avg. warranty items per home) x $250 (avg. cost to respond to each item) x % reduction in warranty items (improvement)	20% reduction in warranty items	$250
PLUS % increase in overall customer satisfaction (improvement) x 0.17 (added buyer referrals) x 500 (no. of homes sold annually) x 5% (buyer conversion rate) = no. of added sales x $30,000 (avg. profit per home) ÷ 500 (no. of homes sold annually)	1% improvement in customer satisfaction	$255
Warranty		
$7,200 (avg. per home reserve) x % (improvement)	10% reduction in reserves	$720
Total		**$7,250 per home**