

# On Productivity, Job Costing, and Successful Shotcreting

By Ryan Oakes

**A**s a member of the International Honor Society in Economics and with a double BS in Finance and Banking, I came into the world of shotcrete prepared a little differently than most entrants to the field. That was over 20 years ago, but the principles of understanding Time, the Value of Money, and Opportunity Costs are indelibly ingrained into my psyche.

Currently, along with my business partner, who is also from a manufacturing and business background in an international playing field, we run a trucking company, a dry-mix shotcrete company, a PebbleTec company, and a design company all under one roof. Collectively, we have between 55 and 60 employees on any given day. In a business this size, productivity and understanding job costing are key to survival.

I have always found it interesting that within the trades, job costing is understood as “price per foot” or “unit pricing.” It’s a simple method, but it is as inaccurate as gauging the wind speed with a wet thumb.

We predominantly work with pool builders providing concrete shells for them, but we also do some industrial work. The two worlds, on some levels, couldn’t be further apart; on other levels, they are quite identical. It is contracting after all, and the world of contracts often involves a certain number of risks and wild-ass guesses.

Many of our peers in the shotcrete industry price their work based on market rates, and they really don’t understand costs. It is an interesting method of pricing, considering our costs can swing wildly and widely with variables such as labor, fuel, overhead, size of job, how the job is priced, distance to the job, and the time consumed for the job overall.

## LABOR COSTS

Let’s start with the topic of labor. Labor can come in the form of hourly wages, salaried employees, and piecemeal. This all refers to the field workers in most cases, but labor should also consider dispatchers and logistics people, salespeople, warranty or field technicians, loader operators, plant managers, mechanics, management, office



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staff, executives, etc. All of these non-field workers are still “labor” and have to be considered when understanding overhead costs. I’ll dig into overhead later.

When considering field workers, which is a large portion of labor typically in the shotcrete industry, we have to look at the payment method. Let’s take the simplest form first: hourly-wage earners. The average work week can range from 65 to 80 hours. Overtime can play a very real role in the cost of wages for these workers and in the expected earnings of said workers. Taking productivity studies aside (there is a lot of evidence that less hours worked in a given week will produce a more productive crew), the crews like to work, and the clients have rigid timelines, so we all acquiesce and work obscene hours. It’s just the nature of shotcrete and concrete construction in general.

Another common form of payment in our industry is piecemeal: pay per pool or per cubic yard (m<sup>3</sup>) of concrete. It is really just an average when it comes down to it, and it isn’t entirely different than hourly pay. Theoretically, there is an incentive to produce more in the same or less time. There is an upside to the company by fixing the cost per job or volume of concrete, and there is an upside to the employee by getting paid the same whether they finish late or early, possibly even getting another job in that day. The inherent downside is that sometimes employees are abused; other times, the employees take advantage of the company and therefore the client (i.e., they report more cubic yards shot than were used in order to increase their pay).

Finally, we often see salaried employees with foremen or staff who have proven their dedication but want a steady check regardless of the weather and other construction obstacles.



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## KEEPING IT ALL RUNNING

So what keeps the wheels turning in a shotcrete business? In our case, a staff of heavy equipment and diesel mechanics, a fleet manager for a fleet of 40+ vehicles, truck drivers, a logistics coordinator who schedules jobs, crews, hotels, materials procurement, office staff, technical staff, and executive staff. All of these personnel have a cost that has to be allocated to each productive or non-productive day of the year. That's tricky if one day a crew yields only 35 cubic yards and the next day they produce 70. Many of the fixed

costs are still inherently the same, yet the cost per cubic yard is vastly different—a hundred percent different when dealing with fixed overhead.

Speaking of fixed overhead, when contemplating costs to operate, one needs to consider their cost of capital. What is that? It is how much it costs you to borrow money, or the opportunity cost of not deploying your own money somewhere else such as in the stock market, in real estate, or in other investments. For most of us, it's the cost of borrowing money. All money has a cost to it.

So, let's consider a simple example: the cost of a pump and truck with an air compressor for a wet-mix crew. Estimate that equipment costs \$350,000, amortized over 5 years with an interest rate of 5%. That works out to approximately \$6605 per month. If a crew produces 1000 yd<sup>3</sup> every

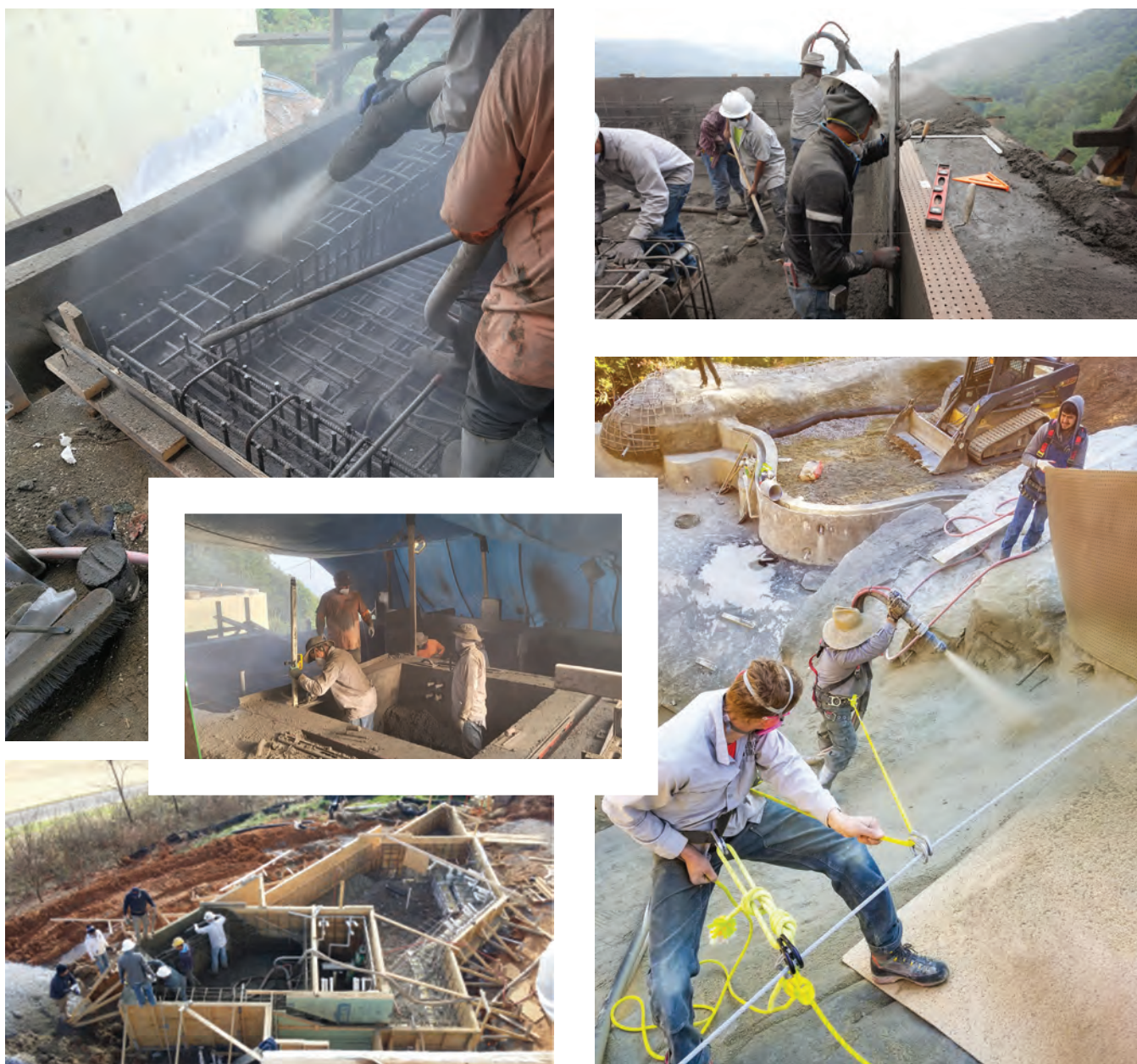


Fig. 1: Labor considerations: access, coordination, and skill sets all play a role in costing out your team.





Fig. 2: Equipment & material costs: owning, maintaining, transporting and storing should be considered.

month of the year, that's only \$6.61 per yd<sup>3</sup>, but if a crew produces half that, then well, it's \$13.21 per yd<sup>3</sup>. If it's an occasional crew that shoots a pool a month, well that equipment costs \$132.1 per yd<sup>3</sup>, and that's before labor, insurance, and all of that other overhead I just mentioned. What does that mean? First, it's unlikely that one could justify the cost of a shotcrete pump unless they shoot at least a few

pools a week; second, it really takes a pool or a job a day to make it pay for itself and be profitable.

Now that we are running every piece of equipment every day, we need mechanics, whether in-house or subcontracted, to work on that equipment. So, one needs to figure out the staff costs to keep that equipment working. Mechanics also need a place to work if it's in-house, so rent

or a mortgage on a building, as well as other costs, go into play in this equation. How much space in your facility is allocated to your mechanics? Divide that number into your cost of owning or renting along with allocated insurance and tax for that space.

The same approach applies to office staff and all the other supporting staff roles I mentioned earlier. Every person needs a place to sit, file papers, have a workstation, etc. Restrooms, break rooms, and storage areas are all pertinent as well. Hidden costs come in the form of cleaning staff, exterior maintenance, vending machines, ice machine maintenance, air conditioning, heat, electricity, telephones, cell phones, internet, and the dreaded costs of insurance (inland marine, auto, work comp, general liability, etc.). Finally, take some percentage of any profit away for Uncle Sam! All of this must be divided into how many jobs you perform or how many yd<sup>3</sup> you produce each month or year. This is how we begin to understand the cost of operation.

## HOW TO PRICE IT

Now that we are beginning to understand the true costs of our work, let's consider our pricing structure.

As I mentioned earlier, our industry is misguided—it sees work as a unit and not much more. So that puts us, as the suppliers or applicators, in the tough position of adhering to that method and not going out of business. Fair enough.

We get to adapt, but we have to do so as informed business owners or managers and truly understand our costs to be able to understand how to price a job.

Take for example a basic swimming pool with a very simple set of steps that consumes 40 yd<sup>3</sup> of concrete. This pool can be finished in half a day, give or take a couple of hours. Add bar stools, a cover box, a vanishing edge, a tanning shelf, deep-end benches, and a large set of stairs or two, and now this pool will not only take a full day but probably two days. Maybe we added 10 yd<sup>3</sup> of billable material all in, but did that make up for spending all that labor and overhead, not just for a half day or a whole day, but for two whole days? With the additional labor required, we are only placing 25 yd<sup>3</sup> per day, not 40 or 50 yd<sup>3</sup>, but for the same costs of two jobs that could have used 50 yards each. In other words, pricing by material used for this job is much less profitable than pricing for two simpler pools, placing more material with less time intensive work.

It's bad enough that we are going to spend all that energy for half the volume of concrete (the way most shotcreters invoice), but that loss is compounded by the lost opportunity cost of not shooting another job the next day. This is a very key point. For example, you can earn two days of revenue for \$15,000 each day plus incur the costs of two days, or you can earn one day's revenue but incur two days of costs. There is a clear problem with this.



To be successful in this industry, one needs to have a bit of financial savvy and a lot of grit. Start paying attention to your costs and adjust your pricing accordingly. It does no good to anyone to work for just a paycheck. There is too much liability in our shotcrete businesses to not make a profit. A successful company knows their costs to do work and will be prepared to make and pay for mistakes. The successful shotcrete contractor should be in it for the long haul, allowing them to serve the industry for decades, not just a few years during boom times with high demand.



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