



CONSTRUCTION INDUSTRY ADVISOR

What are change orders really costing you?

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Check your company's vital signs with KPIs

The future of 3D printing in construction



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What are change orders really costing you?

Change orders are an inevitable part of the construction business. And that's not necessarily a bad thing. When properly handled, a change order can mean more revenue coming your way and, if all goes well, a more profitable project.

On the other hand, without proper planning and an effective process for managing them, change orders can just as easily erase a job's profits. It's been said that you can't manage what you can't measure — and that's certainly true of change orders. Unless you understand their true costs, it's impossible to manage them and preserve your well-deserved payoff for the extra work completed.

3 types of costs

Possible reasons for change orders include unforeseen site conditions, inaccurate or unclear specifications, owner-requested scope or design changes, unseasonable weather or other acts of nature, and materials shortages.

Although certain costs associated with these changes are readily apparent, many others are less obvious. To accurately price change orders, you need to consider three types of costs:

1. Direct costs. These include labor, materials and equipment. They can go beyond the expenses involved in doing the actual change-order work. For example, the costs may also include staff time needed to analyze the changes, prepare estimates, and communicate with the owner or engineer. You could incur professional fees for redesign work. Or you might have to put in additional hours for supervision, safety meetings and cleanup. There's the cost of fuel, utilities and storage to consider as well.

2. Overhead and indirect costs. As you're no doubt aware, direct costs are only one piece of the puzzle. Unless you recover your overhead, indirect

costs *and* a reasonable profit, you could end up losing money on a change order.

Overhead for construction businesses is much like that for any company. It includes rent, office equipment and utilities, and management and administrative staff salaries and benefits, and other general business expenses.

Related to overhead, but distinctive nonetheless, are indirect costs. Generally, these are considered a cost identified with more than one job, such as workers' compensation insurance, or a cost that's only indirectly related to on-site activities, such as payroll service fees. Ask your CPA for help identifying other types of indirect costs.

Many contracts provide for a markup percentage for change orders, such as 10% or 15%, intended to cover overhead, indirect costs and profit. But this often isn't enough for a contractor to break even on change-order work. One study, for example, reported that the average overhead percentage for electrical contractors was more than 19%.

3. Consequential costs. Change orders can disrupt workflow, creating a ripple effect felt throughout a project. These "consequential" costs may include those associated with:

- Work delays,
- Overtime,
- Crew reassignment,
- Site access issues and
- Weather conditions.

They could also include the cost of lost productivity resulting from things such as stacking of trades — that is, the need for multiple tradespeople to

Should you ever work for free?

Generally, no contractor should ever work for free. After all, it's not your fault if the plans and specifications fail to accurately reflect the owner's *current* wishes. If the contract's scope is revised, you should be compensated accordingly.

That said, the benefits of doing a moderate amount of free work can sometimes outweigh the costs. These advantages may include:

- Building goodwill with an owner who could offer you more work in the future,
- Avoiding conflict with an owner who has a reputation for litigiousness,
- Helping secure the quick release of retainage, and
- Improving the chances of completing the job on time and within budget.

If you conclude that the pluses of providing free change work outweigh the minuses, be sure to take credit for it. Many contractors document such work with a "no-cost change order." Doing so not only allows you to track the additional costs involved, but also shows the owner how much additional value you're providing.

work in a limited space. Problems often arise, too, from "dilution of supervision." This is when the attention of project managers and on-site supervisors is diverted from planned work to the change-order work.

Mind the details

Ensuring adequate compensation for change-order work starts with the contract. Before signing, check any contractual limits on pricing change orders, such as maximum markup percentages. If they don't sufficiently cover your costs plus a reasonable profit, try to negotiate higher limits.

In addition, familiarize yourself and your project manager with the contract's change-order approval procedures. Put controls in place to ensure they're followed to the letter. Generally, you should avoid beginning out-of-scope work until a change order is approved in writing.

Once a change is approved, stay focused on costs. That means tracking all three types of costs discussed above. Consequential costs are usually the most difficult to prove, so it's critical to have systems in place to measure and

document productivity, compare it to the originally budgeted hours, and calculate the impact of change work on productivity.

Protect the bottom line

No matter how profitable a job looks on paper, that margin can fade to zero without effective change-order policies and procedures. By understanding the true cost of change orders — and ensuring your construction company has processes in place to document and recover those costs — you can help protect the bottom line of each job and your business as a whole. ■



Worth a look: the Work Opportunity Tax Credit

Construction companies continue to look far and wide for laborers. If you're willing to expand your hiring pool and do some additional tax documentation, the Work Opportunity Tax Credit (WOTC) is worth a look.

The purpose

The WOTC is designed to incentivize employers to hire employees from "targeted" groups made up of typically disadvantaged individuals. The tax break can be worth as much as \$2,400 for each eligible employee hired and even more in other cases. For example, the WOTC can be worth \$4,800, \$5,600 or \$9,600 for certain veterans, and \$9,000 for long-term family assistance recipients.

The credit is generally limited to eligible employees who begin work for the employer before January 1, 2026. An employer is typically eligible for the credit only for qualified wages paid to members of one or more of 10 targeted groups: 1) qualified members of families receiving assistance under the Temporary Assistance for Needy Families program, 2) qualified veterans, 3) qualified ex-felons, 4) designated community residents, 5) vocational rehabilitation referrals, 6) qualified summer youth employees, 7) qualified members of families in the Supplemental Nutrition Assistance Program, 8) qualified Supplemental Security Income recipients, 9) long-term family assistance recipients, and 10) qualified long-term unemployed individuals.

There's also a minimum requirement that each employee must have completed at least 120 hours of service for the employer. The credit is unavailable for certain employees who are related to the employer or work more than 50% of the time outside of the employer's trade or business. Additionally,

the credit is generally unavailable for employees who've previously worked for the employer.

The calculations

For employees other than summer youth workers, the credit amount is calculated under a basic set of rules. The employer can account for up to \$6,000 of first-year wages per employee (\$10,000 for "long-term family assistance recipients"; \$12,000, \$14,000 or \$24,000 for certain veterans). "First year" refers to the year-long period beginning with the employee's first day of work; "second year" is the year that immediately follows.

If the employee completed at least 120 hours but less than 400 hours of service for the employer, the wages accounted for are multiplied by 25%. If the employee completed 400 or more hours, all accounted-for wages are multiplied by 40%.

Thus, the maximum credit available for first-year wages is, as previously noted, \$2,400 ($\$6,000 \times 40\%$) for most employees. However, a \$4,000 credit ($\$10,000 \times 40\%$) can be calculated for some long-term family assistance recipients. And an employer may be able to calculate credit



amounts of \$4,800, \$5,600 or \$9,600 (\$12,000, \$14,000 or \$24,000 × 40%) for certain veterans.

In addition, for long-term family assistance recipients, a 50% credit may be available for up to \$10,000 of second-year wages, resulting in a total maximum credit, over two years, of \$9,000 (\$10,000 × 40% plus \$10,000 × 50%).



A one-year carryback and 20-year carryforward of unused business credits is allowed.



For summer youth employees, the rules in the preceding paragraph apply, except that the employer can account for only up to \$3,000 of wages. These wages must be paid for services performed during any 90-day period between May 1 and September 15. So, for summer youth workers, the maximum credit available is \$1,200 (\$3,000 × 40%) per employee.

The limits

Certain limits apply to the WOTC. First, no deduction is allowed for the portion of wages equal to the amount of the credit determined for the tax year. Second, other employment-related credits are generally reduced with respect to an employee for whom a WOTC credit is allowed.

And third, the credit is subject to the overall limitations on the amount of business credits that can be taken in any tax year. However, a one-year carryback and 20-year carryforward of unused business credits is allowed.

Because of these limits, there may be circumstances under which an employer might elect not to have the WOTC apply. Also, there are some additional rules that, in limited circumstances, prohibit the credit or require an allocation of the credit.

Two for one

Hiring from targeted groups can fill up your workforce while potentially saving you tax dollars. Contact your CPA for more information about the WOTC. ■

Check your company's vital signs with KPIs

When you go to the doctor, the first thing the medical staff does is check vital signs such as your temperature and blood pressure. That's because if any of these measurements are outside the norms, you might have an underlying problem that the doctor needs to address.

For the same reason, construction company owners should regularly check key performance indicators (KPIs) of their businesses to monitor financial health and equipment maintenance.

Financial ratios

Certain ratios calculated using your financial statements can serve as particularly valuable KPIs. They enable you to gauge how your company is doing, compare its current position to past results and even see how you're measuring up against other similar construction businesses.

Indeed, industry "benchmarking" can provide an early warning of financial risks. Data is available from a variety of sources, including

the Construction Financial Management Association (CFMA).

The CFMA's Construction Industry Annual Survey provides a variety of financial ratios and other KPIs, broken down by company size, industry sector and region. The right measures for your company will depend on factors such as its size and specialty, but here are a few examples:



Current ratio (current assets ÷ current liabilities). A valuable KPI for construction businesses, current ratio measures liquidity — that is, the ability to satisfy short-term liabilities with cash and other liquid assets. In the CFMA's 2021 survey, the average current ratio was 1.7 (or 2.4 for smaller businesses; that is, those with less than \$10 million in revenue).

Months in backlog (backlog ÷ [revenue ÷ 12]). This indicates the number of months it'll take to complete all signed or committed work. A lower ratio may signal that the company needs new contracts to maintain consistent revenue. In the CFMA's 2021 survey, the average was 7.9 (5.8 for smaller companies).

Debt-to-equity (total debt ÷ net worth). This measures your construction business's use of leverage. A high ratio enables you to earn more on invested equity but also heightens your exposure to risk. In the CFMA's 2021 survey, the average ratio was 1.4 (0.7 for smaller companies).

Working capital turnover (revenue ÷ working capital). This ratio indicates the amount of revenue generated by each dollar of working capital. As a rule, a higher number is better — though

an extremely high ratio could raise a red flag that your working capital is stretched too thin. In the CFMA's 2021 survey, average working capital turnover was 6.8 (4.4 for smaller companies).

Equipment utilization

Too often, contractors wait until equipment breaks down before repairing or servicing it. Monitoring the right KPIs and using data analytics can allow you to anticipate when maintenance or replacement parts will be needed, minimizing downtime and lost productivity.

For example, sensors embedded in some types of equipment can collect real-time data such as fuel usage, mileage, hours of operation, engine temperature and fluid levels. Tracking and acting on these data points allows you to perform “predictive maintenance” rather than react to breakdowns after they occur.

Get a checkup

Even a healthy construction business can benefit from regular KPI-based checkups. In fact, most financially sound companies get and stay that way by keeping up with the numbers. Ask your CPA for help. ■

The future of 3D printing in construction

Imagine, if you will, creating virtually any tangible object based on the digital, three-dimensional (3D) model on your computer screen. Well, you don't have to imagine it — that's 3D printing, theoretically at least, and it's in use right now.

This technology has advanced dramatically and could transform many industries, including construction. While its ultimate impact remains uncertain, the potential benefits and disadvantages are becoming clearer.

How it could help

For starters, 3D printing could reduce materials and labor costs. Printing materials on the jobsite would mitigate many of the supply chain issues that have plagued construction in recent years. And it virtually eliminates wasted materials because everything is printed to spec.

In fact, the design options are nearly limitless, allowing for innovative and often more energy-efficient structures. And much of the process is automated, which should save considerable time.

Another potential advantage is that a smaller number of workers are typically needed to assemble 3D-printed building components. Thus, the technology could help ease the skilled labor shortage. Also, because of the highly automated nature of 3D printing, fewer jobsite injuries should occur.

Some possible problems

3D printing faces several possible problems that will slow its adoption in construction. First, there's a lack of regulation. Traditional building codes weren't designed to address 3D-printed structures. Until the regulatory environment

catches up with the tech, a great deal of uncertainty over compliance, liability and other legal ramifications will likely hamper its use.

Second, as of this writing, limited building materials exist. Most 3D printers can work with only concrete and plastics, so they're not much use for jobs that call for other materials, such as wood or steel.

Third, 3D printers with the necessary functionality are expensive, as are the software programs that run them. And using a 3D printer on a jobsite involves substantial transportation, setup and dismantling costs.

Finally, there's the workforce impact. Many industry observers are concerned that 3D printing will displace many construction workers.

One example

So far, construction projects using 3D printing have generally focused on small homes, including some multi-home developments. In late 2019, however, a U.S. company, Apis Cor, constructed the largest 3D-printed building to date: A two-story, 6,900-square-foot office building in Dubai.

The building was erected in 21 days by three workers using a single 3D printer and a gypsum-based material. Note that the foundation, roofing, windows and insulation were installed conventionally, and the floors consisted of precast slabs.

Not written in stone

The future of 3D-printed buildings is hardly, shall we say, written in stone. But given its potential benefits, construction business owners should keep an eye on this developing technology. ■

