CONSTRUCTION

Project Management Guide

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PART 3

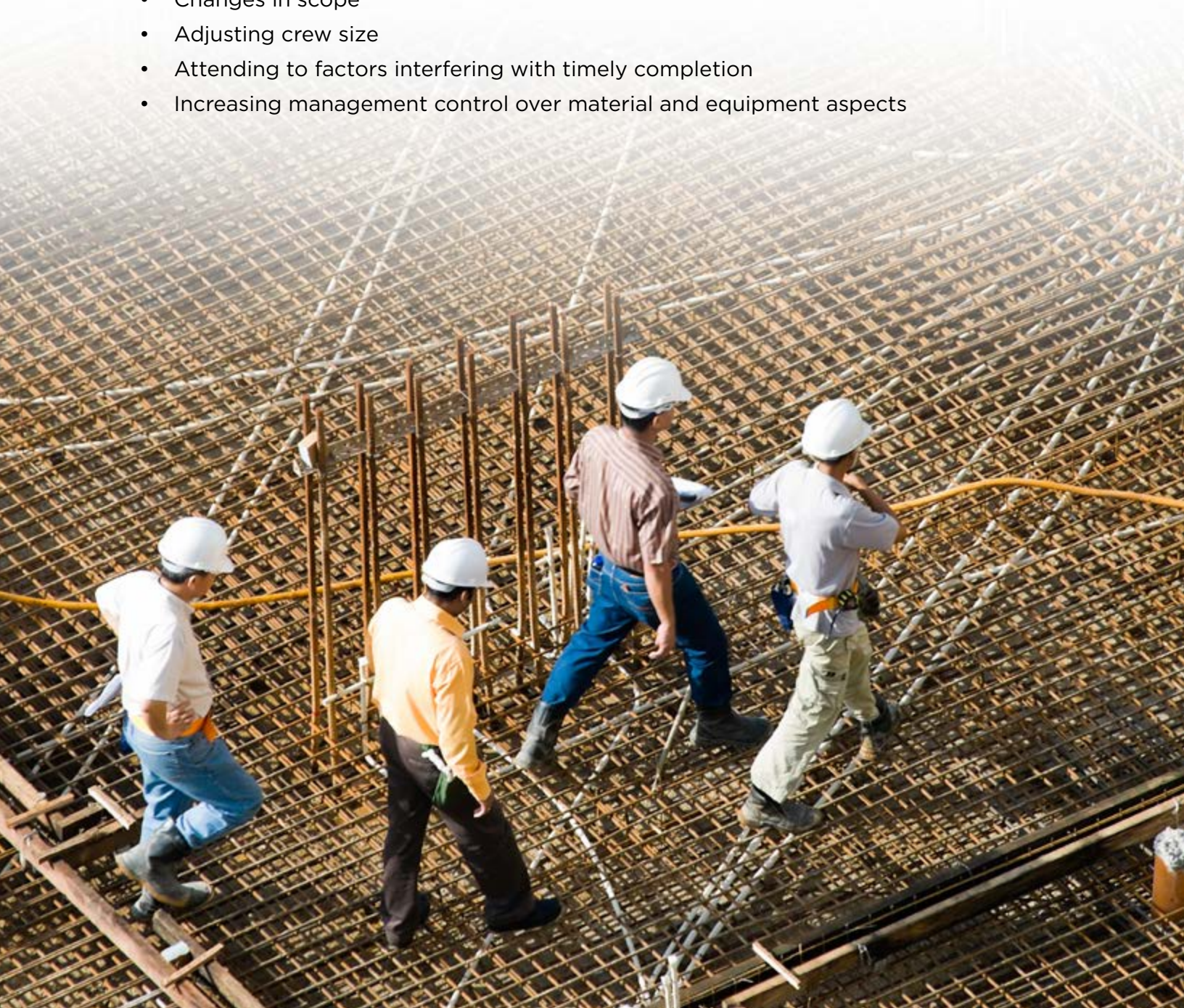· · · · · · · · · · · · · · · ·

PROJECT CONTROLS

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Controlling Project Costs

Using cost controls during a project provides the necessary assurance that spending won't exceed the budget. When cost controls are used at the activity or task level, they also help locate problem areas within the schedule and encourage new efficiencies. If costs for a particular activity rise too fast relative to the percent complete, then adjustments may be in order. These adjustments might include:

- Changes in scope
- Adjusting crew size
- Attending to factors interfering with timely completion
- Increasing management control over material and equipment aspects

Once construction is underway, it's very difficult to address cost problems arising from mistakes or oversights that should have been dealt with during the planning stages. If there's an inadequate work breakdown structure, budgets that have been highly reduced in order to increase competitiveness, or an overall budget is unrealistic, then it's time for a meeting with management, and quickly. If attention was put into planning a realistic project, with achievable deadlines and budget, utilizing the cost controls set in place will help mitigate budget problems once the project is underway.

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USING THE RIGHT TOOLS

According to the Construction Users Roundtable, or CURT, project costs should be reviewed every month with an effort to track all fixed-price contracts. Some projects, however, benefit from weekly or even daily tracking. When a project starts to get into trouble, increasing the frequency of budget reviews adds a margin of safety to both cost and timing.

One of the more difficult aspects of cost control is managing reimbursable costs. These require tracking work progress and purchases already spent against the budget. If these aren't reviewed or managed well, predicting the final cost of assembly, task or activity will be challenging. Review the tools you're using and make sure you're not overlooking features that will provide transparency. If needed, find new, more effective tools.

Changes in project scope due to the emergence of new information are inevitable in construction. It's not a question of whether, but rather when the next change will take place. If you have project management software like Procore, change orders are quickly and easily tracked from cradle to payout and beyond. Construction software helps ensure cost changes continue to fit into the project budget and approved changes are transparent and tracked in real time with all parties involved.

Just as costs must be tracked, they should also be reported. It does no good to have growing cost reports sit buried in an inbox or budget report. Items on the verge of and those already running over cost should be called out for attention, whether in a clearly marked section of the budget report or in red type on a ledger. How close an activity is to going over budget depends on more than just the amount spent to date in relation to the total budget for the activity– the amount of remaining work is also a major consideration.

There is no shortage of construction accounting software and cloud offerings that handle the accounting aspects of the project. The best options are able to record costs based on cost accounts that track, as closely as possible, the activity or task level. Getting to this level is essential if you want to track in extreme detail where money is being spent. You might have a project budget of $2,000,000 for carpentry, but if you don't break costs down into wall versus roof carpentry, then it's much harder to know exactly where the carpentry budget is causing you to dip into the red. Additionally, at project closeout, you will miss valuable data that could inform decisions on future projects.

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PROCURING EFFECTIVELY

According to Edward Opall, CPA, CCIFP, and director at EisnerAmper, Real Estate Construction Services Group, the best opportunity for reducing costs and increasing profitability on a construction project is to have effective procurement. This extends beyond consumables to subcontractors as well. Developing and using a strategic purchasing plan and packaging all the components of work products gives contractors the best opportunities for competitive pricing according to Opall. He also stresses the importance of incorporating unit prices, labor rates and alternates into purchasing decisions.

There are multiple reasons why project costs begin to escalate. A few of the common ones to watch out for include:

ACTIVITIES OUT OF SEQUENCE

Construction is a social business that requires interaction between many participants, in which unofficial negotiations are always taking place. Sometimes these negotiations take place because the planners were incorrect, but more likely, on a well-planned job, they take place because it's in the best interest of those negotiating the change. These negotiations often end up rearranging the order of activities. For example, drywall installers might try to get ahead of schedule by requesting to work alongside electricians, installing the drywall while the electrical wire is being pulled. Besides potentially getting into each other's way, there is an increased likelihood of making a mistake and installing drywall over a spot where the wire hasn't been pulled yet. Perhaps material costs will come out of the subcontractors' allowance, but time will be lost and the cost of electricians may increase for delays.

SCOPE CREEP

Scope creep is a phenomenon that occurs during project execution and is often so gradual it goes unnoticed. The likely culprits are new products or features being added and upgraded, or design changes that escalate time and costs without increasing the budget. Sometimes called "value for free," this cost escalator can only be adequately handled in the very early stages. If a project has had many changes in scope before construction began, and there has been a lot of back and forth amongst participants on the design and critical project aspects, then it could be advantageous to institute daily or weekly budget monitoring in the early stages of the project so you can detect creep very early on.

INCREASES IN MATERIAL COSTS

Even when contracts include language to protect contractors from rapidly rising material costs, this can still become a cost problem. A 9% rise in rebar cost is not recoverable if the contract specifies the cost must rise 10% or more before it's eligible for reimbursement. That 9% increase is a significant cost for the contractor to bear. The solution might include a thorough review of the quantities of the material used and determining if there are options for reducing that amount. Other options include changing suppliers or submitting alternative materials as a substitute. Beyond making sure the project stays within budget, cost controls are really the measure of how well the project is planned, and in the end, how well it is managed.

CHAPTER

12

Quality Control in Action

QUALITY BEGINS AND ENDS WITH PEOPLE

The quality control plan is created early in the project lifecycle and becomes the guide for assuring quality as the project is built. While quality begins and ends with those doing the work, conversely, few things are more detrimental to quality than a lack of time. When rushed, there is a natural tendency to focus on completion. This focus on the endpoint rather than the *process* compromises quality because details are often overlooked and shortcuts are taken. The cost of rushing becomes painfully clear when activities have to be duplicated to get the quality up to the level of specification. If you don't have enough bandwidth to do the job correctly the first time, how will you have enough to do it correctly a second time?

Lack of proper training and subpar skillsets also contribute to poor quality. Whenever new and unfamiliar materials or processes are introduced, there will inevitably be a shortage of necessary skills and understanding to perform the task. Often times when a new process is introduced, training is abbreviated or skipped altogether to accelerate progress. This drastically decreases quality control as teams are never properly trained to execute the job to company standards and often work under their own personal assumptions of "quality." When dealing with these factors affecting quality at the task level, the best answer is to have experienced leaders. Foremen, project managers, and superintendents who know how to lead, inspire, coach, counsel, and effectively discipline will be able to address problems most effectively.

TOTAL QUALITY AS A GOAL

There is something to be said about a total quality approach to construction projects. When using total quality, no defects can occur anywhere in the process. From a permanent perspective, this is an unrealistic goal, but according to project management experts, it helps prevent organizations from ever reaching the point of taking quality for granted. Assuming total quality control is adopted at the beginning of the project, all design considerations should be scrutinized from this perspective. Materials, processes, and equipment must also be analyzed for the desired level of quality and subcontractors and vendors thoroughly vetted.

During construction, the effort then focuses on ensuring the quality standard is met. This adds a layer of tests to ensure inputs to the process have zero defects and that the processes themselves are performed accordingly. In the wake of material defects like moldy drywall and counterfeit electrical parts, it's now more common for those purchasing construction materials to choose their sources carefully and to ask for certifications and samples to confirm the items meet specifications.

Total quality approach from a personnel perspective involves the workers and requires them to monitor their own quality of work, participate in meetings, and suggest improvements. By some accounts, total quality control is very difficult to carry out in construction and may set too high a standard. Others suggest that rather than making the measurement of zero defects the focal point, it is more realistic to see total quality as a commitment to continual improvement.

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PHASES OF QUALITY CONTROL

According to the U.S. Army Corps of Engineers, one way to look at the quality process is to view it in three phases.

In the **PREPARATORY PHASE**, those tasked with quality roles:

- Review plans and specifications
- Verify submittals are approved
- Review the testing plan
- Check preliminary work
- Physically examine materials
- Discuss construction methods
- Review safety

In the **INITIAL PHASE**, those tasked with quality roles:

- Establish the quality required
- Resolve conflicts
- Ensure testing is done
- Review safety

And in the **FOLLOW-UP PHASE**, those tasked with quality roles:

- Ensure contract compliance
- Maintain quality
- Ensure testing reports are submitted
- Ensure necessary rework is completed

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In any case, all parties involved are responsible for ensuring quality. Some of these titles include: Quality Control (QC) Manager, QC Specialists, Superintendent, Subcontractor, Foreman and [the owner's] QC Representative. For continuity, it's important that substitutions of people are kept to a minimum and adequate records of meetings are kept.

As with most aspects of managing construction projects, it's the planning phase that's most important and helps ensure a quality environment is created. Without the necessary plans and processes in place before construction begins, quality is simply an afterthought. Once construction is underway, it's a matter of following the plan and ensuring the right people are in key positions.

CHAPTER

13

Controlling the Schedule

Controlling the schedule requires a combination of planning, skill and luck. This is a multi-dimensional activity that puts you up against a laundry list of things that can go wrong. Essentially, during the construction phase of a project, it is the project manager's job to find and solve problems, which can sometimes feel like detective work.

It isn't practical or effective to look for major cost savings once construction is underway unless you're going to remove a portion of the project. The focus during this stage of managing a construction project should instead be making sure the project is built according to specification. Part of this process includes tracking costs to those budgeted as it provides another indicator of project performance. Additionally, you want to measure how closely the plan is being followed and uncover any deviations. With a clear, in-depth view of the schedule, and a way to track and monitor actual progress, you can see if things are on track or about to derail.

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COMMUNICATE AND OBSERVE

The key indicator to watch closely is the critical path and the activities it includes. Ideally, there will be communication and observation systems in place to supply real time feedback on the activities as they are underway. For example, Procore's project management solution includes a system of notifications that not only remind you of important milestones, but also generate automatic follow-ups inquiring about the completion of activities.

Walking around the project provides tactile and visual information about how work is progressing. It's one thing to get an email from a subcontractor telling you a portion of the work is 75% complete, but quite another when you visit the location and are able to see, in person, that the project is actually only 50% complete. There are also various inspections by third parties that can help validate the complete picture. It's very important to rely on more than a single type of input when gauging the progress of the project.
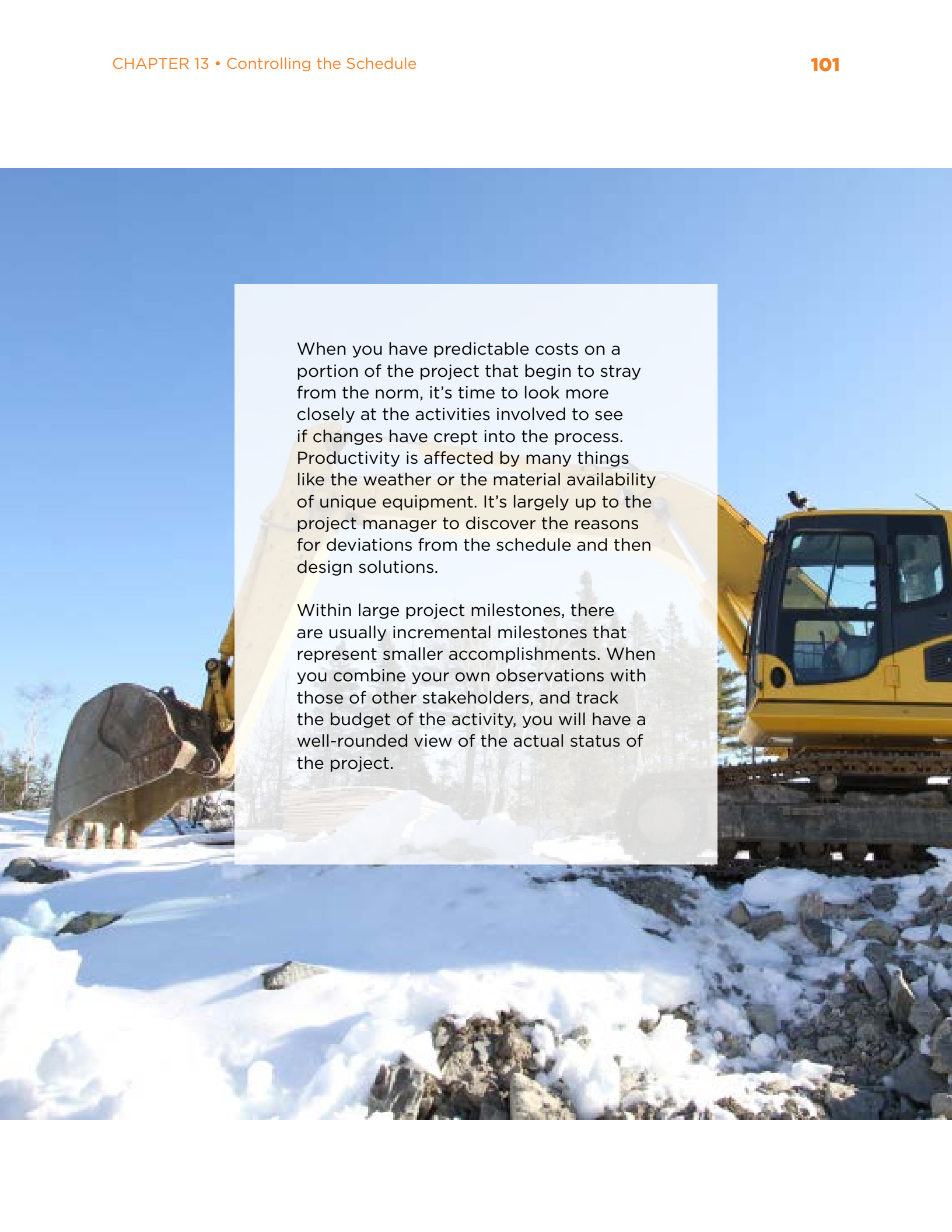
Along with clear communications and personal observations, you can utilize the project budget to compare with the work in place and get another view of progress as well as the quality of completion. Ramping up an operation will often consume more of an activity's budget than originally planned, but once that activity is in motion, the costs often level out. So when using the budget as an indicator, you have to simultaneously keep the big picture of the activity in mind while scrutinizing the work that leads up to it. Keeping a very high level of detail in the cost accounts will also provide a better view into what's happening.

Over time, you'll see patterns emerge in the velocity of outgoing expenses. This is particularly true in projects that have many repetitive installations. For example, on a mixed-use high rise, where some floors are residential, there will be repetitive installations of bathrooms and kitchens. As those items are completed on the initial floors, you can see a pattern of expense that can become indicative of future problems.

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When you have predictable costs on a portion of the project that begin to stray from the norm, it's time to look more closely at the activities involved to see if changes have crept into the process. Productivity is affected by many things like the weather or the material availability of unique equipment. It's largely up to the project manager to discover the reasons for deviations from the schedule and then design solutions.

Within large project milestones, there are usually incremental milestones that represent smaller accomplishments. When you combine your own observations with those of other stakeholders, and track the budget of the activity, you will have a well-rounded view of the actual status of the project.

THE HARBINGER OF COMPLEXITY

Even though construction projects run on schedules, linear activities are largely self-organizing and as Robert C. McCue, P.E., consulting engineer with MDC Systems points out, they will "proceed at some pace regardless of the scheduled time allotted." McCue maintains that construction schedules, with their assumptions of consistent input and output relationships yielding constant completion percentages, are "overly simplistic," leading to incorrect decisions as complexity increases. His prescription is to be constantly vigilant and watch for the following signs:

- The system used to track completion becomes unreliable
- The critical path has increasing numbers of critical activities
- Updates to the CPM schedule are outdated before being posted
- Critical activities exceed 50% on unfinished work
- Additional labor doesn't increase completion rates
- Traditional management tools become unreliable
- Schedule influencers feel frustrated with their inability to mitigate events

McCue makes a call for creativity when complexity begins taking hold of a project. This can include going through trial and error tests to see what solutions present themselves. Encouraging team members to explore different approaches and test the most likely resolutions expands the available solutions exponentially.

Construction projects are unique in their dynamic nature with disparate organizations that have competitive incentives. Even the most meticulously planned projects create surprises, so watch out for the following culprits that may interrupt your schedule:

- Extraordinary weather events
- Emergency adjustments to the scope
- Catastrophe near or on site
- Manpower, equipment or material shortages caused by unusual events

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It's not possible to plan for these risks so if the owners are still going to continue with the build, the next step is to carefully and quickly plan a recovery strategy. For example, a large concrete-intensive project starting up in the vicinity may negatively affect the local supplies of rebar. Keeping an eye on the long-term view includes watching for changes occurring outside of the project that can subsequently affect your own project. For events that foretell a problem, like missed deadlines not on the critical path and contingencies inadequately planned for, take a step back and reformulate your short-term schedule and test for its effects on the critical activities. Otherwise, look for opportunities to make up for lost time and resources, in order to get the critical path back on schedule.

A large part of controlling the schedule comes down to continually assessing risks and staying alert to changes. Change is the only constant, so adopting an accepting attitude will help keep you and the schedule flexible. With flexibility comes adaptability, a natural and effective response to change.

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CONCLUSION

Managing construction projects can be an incredibly challenging undertaking. Every time a new project starts, it is a wholly new process. Maybe some participants will stay the same, but the territory, scope, materials, processes and equipment will constantly change. Each owner has different goals from the next, and in all, most aspects of one project won't resemble any others.

There is no substitute for planning. How well things are planned will determine the overall success of the project. While excellent planning won't guarantee a successful project, it can eliminate one of the major reasons why some construction projects fail, and why others don't measure up to expectations.

If you're new to project management, we hope this three-part Project Management Guide taught you new techniques that will serve you well. If you're experienced, perhaps it served as a refresher, introduced new concepts and perspectives, and increased your understanding of the profession. With your next project on the horizon, we hope you regularly revisit these pages for reminders, guidance, and inspiration.

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