

Accelerating late-stage construction: Mastering the sprint finish

Major projects in late stages of construction face unique challenges that can drive substantial delays and cost blowouts. But it doesn't have to be this way.

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Major construction projects are, on average, delivered one year behind schedule and 30 percent over budget.¹ On many large industrial projects, high levels of complexity create productivity bottlenecks that can slow work to a crawl.

This is especially true when a project is 70 percent complete or more. By this late-stage, commissioning teams and operations teams are both in play; scope carryover is accumulating between successive stages of a multi-year project; physical worksites are becoming more congested; and earned progress is tailing off (as bulk construction slows towards the final completion point).

At this stage, commissioning handover dates are looming and project delivery teams are often already behind schedule and over budget. These daunting challenges, combined with a real or perceived lack of project success, means delivery teams are struggling not only with project fatigue but also a nagging sense that “it is too late” to change the project’s trajectory.

It is never too late to improve a project’s productivity. The right interventions can remove bottlenecks and significantly boost productivity, providing the starting point from which to launch a sprint finish, rather than cruise to late completion.

In our experience, one central reason that major projects struggle with both pace and productivity at the late-stage is misaligned incentives within the joint project team. The construction team is focused on productivity: keeping the workforce busy and increasing utilization of people and resources. The commissioning team is focused on systems: reaching critical commissioning milestones even if they require a change in scope. And the operations team is focused on ensuring the integrity and operability of the post-construction asset and eliminating carryover work. In essence, this means that project teams are trying, and often failing, to reconcile the

age-old problem of completing bulk construction in specific areas while also commissioning partially overlapping sub-systems.

As daily productivity bottlenecks become both more obscure and more volatile, it can be hard to identify what precisely is hurting productivity most on a given day. Is it scope definition, worksite access, people and resource availability, or execution intensity? This lack of clarity is often due to increased numbers of teams and fractional work fronts. Often, there are many small teams working in multiple locations across the site, which necessitates greater coordination and management.

In this late-stage evolution from construction to commissioning, project leaders frequently struggle to intervene to remove bottlenecks and swiftly improve productivity. But there are several effective interventions that can tackle this. Leaders need to apply effort across several areas, including planning, readiness of work, control of work, execution, and close out.

Create an integrated plan, early on, with agile iteration

Clearly, the commissioning plan should be integrated with the core construction plan early in the project. Yet this is often tackled too late. Leaders must have visibility into what physical work remains, so that they can maintain a flow of execution-ready work and make rapid choices on what gets done on-site to attain the fastest, safest completion possible. Put simply, they must take an agile approach to building and improving the plan during these late-stage projects.

Project organizations typically have many layers of management which complicate communication and dilute ownership. The planning function can oscillate between an overly-granular plan that takes too long to update (and is therefore redundant once

distributed) and a “last planner” method where scope definition, people and materials availability, and worksite access are driven by the requisite daily on-site tasks.

To overcome this challenge, some of the best project teams form agile delivery squads which tackle “grouped” or “typical” scope items (for example, valve repair or certification) under the close guidance of the commissioning team. By adopting agile philosophies of cross-functional teams, regular sprints, and ambitious deliverables, it is possible for project leaders to maintain safe physical progress—even as work fronts fragment and multiple teams compete for site access. Project leaders can invest in digital tools to support this integration. Such tools can scan outstanding work across the project, identify and provide guidance on clashes, and push both area-build and system completion.

Develop robust execution readiness processes

Project leaders should establish criteria for readiness – the conditions which must be met for a physical task to be considered “execution-ready” – early in the project and incorporate them into the project plan. This means setting out precisely what “ready” means, and which stakeholders have assigned accountability for each criteria or task. Leaders must embed a mindset change to ensure named members of the operations team own work readiness by portraying their role as “*accelerating readiness for work execution*” rather than simply “*waiting for everything to be ready so they can sign off.*”

To ensure there are no surprises, readiness needs to be tracked tightly in the build-up to execution (at least six weeks out, but obviously dependent on procurement lead times). Tracking must be transparent, while weekly alignment between planning, readiness, and execution will help flag obstacles as well as opportunities.

One offshore gas facility helped drive this mindset change by resetting its organizational structure to create a single point of accountability for work readiness. This simplified communication and decision-making, and accelerated detection and resolution of readiness issues before they caused delays in physical completion. If a task wasn’t execution-ready, the team could recognize that early enough to pull it back on-track; or move it out of the way and allow something else to proceed. This meant a lower frequency of non-ready work hitting the frontline, which naturally increased productivity. The team had effectively reduced planning “friction” and was therefore able to accelerate physical progress without adding more “force” – that is, people or pressure – to the project.

We believe this is a key concept in predictably and safely delivering major projects, including those already in trouble. Another major offshore project designed and executed rigorous performance management for the readiness process. The rigor of defined criteria helped to boost the number of execution-ready tasks by 30 percent in the first week. Within six weeks, execution readiness was improved by 50 percent, effectively feeding the execution workforce with tasks that they could safely complete without delay. These interventions helped to move the project start-up milestone date forward by one month. As the project was spending \$5 million per day to complete work and would generate \$10 million revenue per day after start-up, this was a massive pivot in value.

Debottleneck control of work (CoW)

On another project, overlapping interfaces during late-stage construction caused significant complications with the CoW environment (that is, the creation and management of permits and energy isolation as the project facilities start to go live). This resulted in frequent delays and stoppages due to permits or other required documents not being

ready—which, in turn, created frustration and tension across the project.

Project leaders can reduce delays caused by permit approvals and isolations by tightly managing CoW performance and implementing lean approval management processes. They can start by placing a CoW team on site to better integrate permits and work required, interfacing between the two to avoid administrative burden. To lead the effort, organizations should invest in top talent with relevant experience. To ensure they have the right mindset and priorities, they should be empowered with the mandate to “enable safe, productive work” rather than simply “enforce administrative control”. This framing should be evident both in their job scope as well as in the chain of command and approvals.

In a lean approvals environment, project teams optimize the number of approval steps to increase safety and accountability. They align work systems with permit approvals so that only necessary approvals are requested and issued. Some teams have bundled tasks to optimize execution—for example, grouping them by the permits or equipment required—supported by weekly coordination across the planning team. Finally, leaders must give the operations team plenty of prior notice through a policy of open understanding to reduce delays from isolations and ensure resources are appropriately allocated.

One major project applied this approach and more than doubled the rate of CoW-ready work flowing to the frontline. Smoothing out the turbulence of delayed permits and confused energy isolations brought greater confidence that work could be executed safely, and this translated into faster—and still secure—execution. Once again, lowering “friction” led to a higher pace without the need for more “force.”

Unleash frontline productivity

In late-stage construction, it is not uncommon to see construction crews spend only 25 to 30 percent of their time actually using tools, with the remaining time spent on planned and unplanned stops, waiting, and movement throughout the site. This fatigues teams, particularly in environments where weather is hostile.

The deployment of lean construction techniques and routines can improve tool time, leading to a real shift in productivity of critical field activities and driving acceleration. These classic lean construction approaches—from cascaded daily targets to productivity and leadership coaching—continue to play an important role through full completion.

In the final stages of a project, some deceleration in physical delivery is often considered inevitable, due to increasing task complexity and the need to increase care as physical facilities become more energized and integrated. Removing each impediment to physical execution – through lean techniques at the frontline – delivers a boost to progress in the final stages, when removing one-third of the time-waste can double the effective hands-on time.

One major LNG plant targeted productivity by using lean construction tools to streamline discrete frontline activities across mechanical, electrical, painting, and insulation trades throughout the site. It targeted a 20 percent productivity gain at the outset of the project. Eventually, it actually boosted critical path productivity between two and three times, depending on the trade and sub-system. These interventions happened when the project was more than 95 percent complete, illustrating that it is never too late to finish on a high.



This integrated set of interventions has dramatically improved outcomes during late-stage construction. Leaders with the “it’s never too late” mindset have effectively changed the trajectory of their projects in the final lap. By gaining a true understanding of how work flows between definition, planning, readiness, control, and execution; taking an agile approach to tracking bottlenecks; and unblocking them on pace, teams can master the sprint finish. ■

¹ Sergey Asvadurov, Tom Brinded, Trevor Brown, Mike Ellis, David Knox, and Rod Speering, “The art of project leadership: Delivering the world’s largest projects,” September 2017, McKinsey.com.

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