

The Truth About Lean Construction

Like the commercial says, 'Just do it,' but don't think you already do all of it

By Dave MacNeel

Lean construction offers the building industry the so-called 50/20/20 potential—that is, if employed properly, lean construction can result in 50% fewer injuries, a 20% reduction in durations and a 20% reduction in cost. If those percentages sound appealing, then read on. However, be warned: Lean construction doesn't come fast, easy or without considerable effort.

Overall, lean construction can be defined by four areas of focus: the consistent application of intense planning, the engagement of crafts, the elimination of waste and an emphasis on learning.

When speaking with professionals in the industry about lean construction, I hear most of them say, "We already do all that." One contractor vehemently responded, "My company has been lean for years!" Unfortunately, after talking to him for a few minutes, it became painfully clear that his company was not truly lean; in fact, the company wasn't even close—it was just cheap with its own people and ruthless with its subcontractors.

Of course, lean construction is not about being cheap or stingy or simply cutting costs or slashing prices. Neither is it about discounting or bid shopping or letting subcontractors tell the construction manager or general contractor what to do.

Lean construction is about delivering maximum value to your customers.

When companies say they already "do lean," it is probably true that, on some level, they attempt to fulfill some aspects of it. However, it is unlikely these firms engage in all aspects of lean construction, and it is even more unlikely they do so consistently. What makes the difference is the degree to which a company follows lean processes and the amount of learning garnered. These two tactics are what separate thriving "lean" businesses from ordinary companies. Lean



"The highest form of lean construction is integrated project delivery."

— DAVE MACNEEL
Co-Chairman, Ohio Valley Chapter,
Lean Construction Institute

construction is what separates Toyota from GM, Ford and Chrysler. And, yes, lean construction can deliver the 50/20/20 results on building projects.

Most construction companies make plans, talk to their people, watch costs and try not to make the same mistakes twice. However, how is it possible to eliminate 50% of injuries, reduce schedules by 20% and cut costs by 20%?

Eliminating waste is the primary answer. In 2004, the Construction Industry Institute studied manufacturing versus construction and found manufacturing, on average, has 12% wasted time in its operations while construction wastes 54% of its work time.

But construction projects are rarely the same or even similar. Contractors do not build Camry after Camry, as does Toyota's Georgetown, Ky., plant. Instead, to use an analogy: we build a bicycle, then a tank, then a boat and a plane, followed by another bicycle. That's how the custom game of construction would look to a plant-based manufacturer like Toyota.

Looking at it this way, our target is the 54% waste inherent in construction that results from never doing the same project more than once. To attack that waste, Lean Construction Institute co-founders Greg Howell and Glen Ballard developed a process called The Last Planner System.™ It drives the four major aspects of lean construction: intense planning, crafts engagement, waste elimination and education. The system has

several parts that attack variation and lack of reliability, including "pull" planning, in which upstream activities are "pulled" by downstream milestones.

The project team also analyzes a project's intricacies and secures reliable commitments from each other about what resources will be required to accomplish a task

and what a satisfactory hand-off will be. Once the project is reviewed and a schedule is created with input from the field, weekly planning begins. In the weekly work planning (WWP) sessions, the project team looks at several items, including a six-week "look ahead" schedule, to ensure resources and information will be available.

Foremen and superintendents then collaborate on detailed, day-by-day plans for the coming work week. The WWP meeting has two other important elements: constraint analysis and workable backlog. "Constraint analysis" looks at anything that could derail the plan: missing information, materials not yet on-site, equipment availability, etc., and assigns someone to remove the constraint by a specific date.

"Workable backlog" is any work ready to be performed but not on the weekly plan because it is not "critical path." This "plan B" work would be initiated in the event the main plan goes badly or is halted for whatever reason. Teams and individual foremen keep a workable backlog because, on lean projects, they often complete planned work early and need to keep crews busy. It is called "workable" backlog because the fallback plan has to be viable and cannot hinder other activities or trades.

The highest, all-inclusive form of lean construction is integrated project delivery (IPD), which involves the owner, the A/E/s and major trades partners working together to deliver a project on a lean basis. Everyone is brought onboard early in the process, usually before design, and their selection is partly based on their capability to work lean, not their lowest bid. This tactic should give an advantage to those companies currently working lean on their projects.



Read AGC's 2011 Allhands winning essay on lean construction, "Initiating a Culture of Lean Construction Within the Firm," at www.agc.org/2011Allhands_Winner.

Guest Commentary

Intense Planning

A company may spend months and months creating, say, 30,000 activity CPM schedules across 16 CRSI divisions, with a few key people to show the owners just how smart the company is and how well it will manage the project. Then, the schedule is proudly plastered on the entire wall of a jobsite trailer. But after the first rain day hits the job, the schedule is never looked at again because it is wrong.

From a lean viewpoint, more work delays coupled with more schedule detail means more delays. Smart scheduling creates milestones based on historical performance data. Set goals to beat industry averages by 5%, 10% or 20%. Then, as the work gets closer to being performed, flesh out the schedule in phases with the people who will actually be doing the work.

Engagement of Crafts

While managers may believe they are com-

municating every day, all day, with their employees about what to do and how to do it—and chew them out for screwing up or not going fast enough—talking “at” people is not necessarily engaging them. People are engaged when they feel they are a part of the team and their opinions and actions matter. Above all, crafts foremen and front-line leaders must be included in discussions of schedule, methods, logistics, site utilization, materials and equipment. If foremen are involved in planning, they generally will do everything possible to make that plan happen.

Eliminating Waste

Stockpiling materials and running at full throttle every minute is rarely the best way to eliminate waste. In fact, it often causes much of the waste on a project. Stockpiles of material are frequently damaged by weather, stolen or made obsolete by a design revision, handled multiple times or interfere with other building activities.

Overburdening people is similar to

overburdening equipment: For example, it is foolish to pick a load greater than the capacity of the crane, as we all know. But in our rush to get things done and overcome poor drawings and upstream delays, we sometimes overburden our staff with an undue amount of overtime. Crews rarely complain because it is good money. However, studies show enormous productivity losses and higher accident rates are associated with extended overtime.

Education

A company's education policy, if done properly, is much more than not making the same mistake twice. Rather, it involves ensuring a staff's continuous improvement by asking them to reflect deeper about a problem to determine its root cause. When this step is taken, the proper countermeasure can be implemented and greatly reduce the possibility of another occurrence. In The Last Planner System, production variances are analyzed not simply to identify the guilty party but also to learn collectively about how and why there was a variance and to explore options to mitigate or prevent it from happening again.

Some Caveats

A company's biggest mistake is to think, fatuously, that it “already does lean” but then never does. Like safety, lean construction is a never-ending journey to improve operations. Start off small, use pilot projects to learn and create in-house “lean champions” to drive the effort. Get proper coaching to accelerate learning and motivate teams.

Like a golfer who improves with more coaching and practice, a company will improve with more intense planning, crafts engagement, waste elimination and continuing education. Further, lean construction requires total commitment and discipline, from individuals to project teams. The Last Planner System has been shown to work again and again, but only when a firm sticks with it.

But a firm doesn't have to be perfect to see “lean” benefits—every lean activity will make the firm better than when it started. ■

Dave MacNeel is the commercial operations manager at Baker Concrete Construction, Monroe, Ohio. He is also co-chairman of the Ohio Valley Chapter of the Lean Construction Institute.

**TOP INDUSTRY LEADERS
RELY ON HCSS SOFTWARE EVERY DAY:**

17 OF THE 20
TRANSPORTATION
CONTRACTORS

22 OF THE 25
HEAVY CIVIL
CONTRACTORS

HCSS
INNOVATIVE
SOFTWARE
FOR THE
CONSTRUCTION INDUSTRY

Shouldn't You?

WWW.HCSS.COM
800-683-3196

CELEBRATING 25 Years

- ✓ Estimating & Bidding
- ✓ Safety Management
- ✓ Resource Management
- ✓ Job Management
- ✓ GPS Solutions
- ✓ Equipment Maintenance
- ✓ Fuel Tracking