Construction Employers Association

CEA FOCUS: LEAN & GREEN

ALL ABOUT LEAN CONSTRUCTION

BY TARIQ SAMI ABDELHAMID, PHD

As editor of the *Lean Construction Journal* and associate professor of Lean Construction at Michigan State University, I repeatedly get two questions: 1) "What is Lean Construction?" and 2) "Why do I capitalize "lean construction" while a good bunch of academics and practitioners do not?"

Given the state of flux that the practice and research of Lean Construction enjoys, it has not been possible to agree on one definition. However, there is much overlap amongst the different definitions out there (for a flavor, visit the cyber spaces of the Lean Construction Institute, the International Group for Lean Construction, and the Associated General Contractors of America Lean Forum). It is noteworthy to mention that the "Construction" in Lean Construction refers to the industry as a whole and not the construction phase. The definition that helps me understand and practice Lean Construction is as follows: "Lean Construction is the impeccable alignment, and continuous and radical improvement of the entire supply chain, from programming to operations, in order to maximize value and minimize waste of a constructed facility."

Lean Construction started in the late 80s/early 90s, when Lauri Koskela, a construction academic, questioned the inability of the construction industry to deliver projects on time, on budget and of desired quality. He attributed this inability to the lack of a theory of production in construction. Concurrently, Greg Howell and Glenn Ballard were experimenting with a management system that could provide reliable workflow on construction sites. These two efforts were the beginning of the Lean Construction community, represented in the International Group for Lean Construction (established 1993), and the Lean Construction Institute (LCI), founded in 1997. Both are powerhouses advocating and conducting research on Lean Construction.

CEA offers a course in Lean Construction by Tariq Abdelhamid, Ph.D, on June 22, with Unit 1, Variation in Production Systems, from 8 a.m.-noon and Unit 2, Pull in Production, from 1-5 p.m. It's part of AGC's Lean Construction Education Program.

With a goal of maximum value and zero waste, the tools found in Lean Manufacturing and Lean Production were adapted to be used in Lean Construction. For example, TQM, SPC, and Six Sigma are all used in Lean Construction. Similarly, tools and methods found in social science and business are used where applicable. The tools and methods of construction management, such as CPM and work breakdown structure, etc., are also used. Three unique tools and methods specifically conceived for Lean Construction are the Last Planner® System, Target Value Design, and the Lean Project Delivery System™. If a tool, method or technique will help fulfill the aims of Lean Construction, it is considered a part of the toolkit.

According to Ballard, "Lean project delivery changes the jobsite concept of reliability, eliminating the 'systemic lying' that pervades traditional project management. With Lean, control means insuring outcomes starting at the crew level. A project is truly under control when you do what you say you're going to do and minimize project disruptions." Howell believes that "understanding the reliable work flow imperative in Lean production runs counter to the construction industry's 'can do' culture. But we must move beyond the deep cultural aspects of that mentality and create a system that cultivates judgment and reliability. We'll never trust each other if we don't become more reliable."

A number of construction companies have embarked on lean conversion initiatives and are starting to

reap the benefits. One practitioner stated, "Lean lowers the 'hair-on-fire' index on our jobs." The Boldt Company, a national provider of construction, consulting and maintenance services, is also embracing Lean Construction. Paul Reiser, Boldt's vice president for production process innovation, cites three reasons: "First, Lean is simply systematically applied common sense. Second, it is counterintuitive. Unlike anything I've seen before, it causes us to rethink how we manage work. And, finally, we see it as an opportunity to deliver high value facilities to the marketplace in shorter time." Remo Mastroianni, Walbridge Lean Construction Director, shares the reaction from field operations: "Crews tell us that Lean Construction practices have helped do their jobs better."

Dan Wojtkowski, network director for design and construction, SSM Healthcare, says, "If we can get the construction community to embrace these methodologies, it will make every person perform their jobs better.… It will make us better, more efficient, and probably more profitable." In the design world, Bob Mauck, Ghafari Architects, has learned over the years that it is not possible for new technologies to solve old and bad practice in the industry, and that the only way is through new thinking and practices such as what Lean Construction provides.

Lean Construction is not only for owners, architects, general contractors or construction managers, it is also embraced by specialty contractors. David MacNeel, Baker Concrete Lean Construction Champion, reports improvements of 50%, 20%, and 20% on safety, time and cost, respectively, as a result of using Lean Construction. At the 2011 Lean Construction Congress, I heard Master Electrician Renee Davall, Young Electric 'Forewoman', a 39-year veteran say she believes Lean Construction has brought professionalism back into construction.

I believe that "Lean Construction" deserves to be a proper noun because it refers to a specific set of principles and concepts used in practice to reach ideals of maximum value and zero waste, waste being non-value-added uses of resources, activities that an owner isn't willing to pay for. While capitalizing "Lean Construction" may remain controversial, it doesn't matter. What matters is the crux of what the lean philosophy is all about. This is aptly captured by a statement by Greg Howell, "Lean is a new way to see, understand and act in the world." **BXM**