

# LEWIS NEWS

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## LEAN CONSTRUCTION - WORKING MORE EFFICIENTLY

**In the early 1930's, the 102-story Empire State Building was built in just 16 months. More than 70 years later, the similarly sized Taipei 101 Tower took 84 months to build. While this may be an unfair comparison, it certainly doesn't feel like progress!**

The design and construction industry is in need of an efficiency revolution. By applying the concepts of lean management the industry has the opportunity to create tremendous efficiencies that will reap benefits for all participants in the process.

Many are quick to dismiss the concept of lean construction because its origin is in the car manufacturing process. They argue design and construction, by its very nature, have far too many variables for this concept to



*At West 8th, core construction set a record for cycle time for its type of Peri system, often just three days per cycle on floors 14-28.*

work. However, the principles at the heart of the Toyota Production System, eliminating waste and optimizing delivery, have broad applications to the construction industry. Applying these concepts to the process will improve timelines, lower costs, reduce injuries and increase profits.

An audit of standard construction practices is a must to begin the transformation to a new way of thinking. A great place to start is asking all team members to suggest areas for improvement. Then, using value stream mapping techniques, create a flow chart of the current process and eliminate every step that doesn't add value.

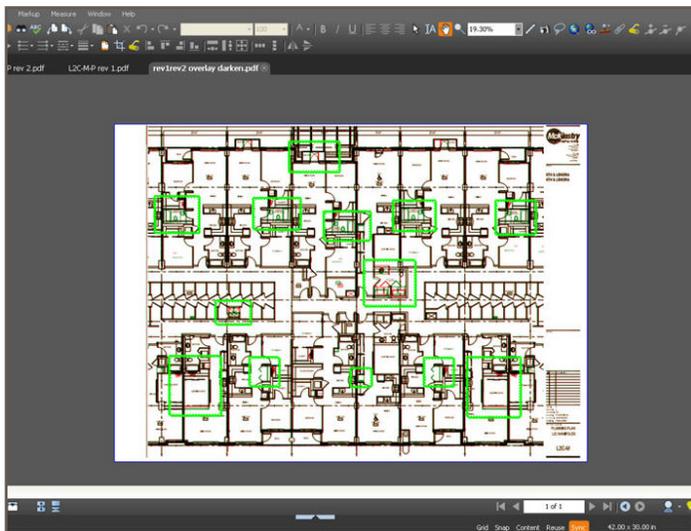


After the first adjustments are made, a second pass through the process should be done with the goal of reducing waste such as worker idle time, defects, redundancy, and inefficient movement of materials. Once the improved process has been developed, give it a try! Based on experience, it won't be perfect, but you will learn and adapt as you go. Change doesn't always need to occur in great leaps; small, incremental steps still signify improvement.

Consider the paper flow on a construction job, for example. Using industry standard procedures, a question regarding the fire alarm system will be transmitted 11 times before the answer is received by the electrician who needs the information. That's 11 rounds of logging, copying, faxing, mailing and filing! Alternatively the project team could employ readily available technologies such as Bluebeam and SharePoint® to interface electronically on a web based portal accessible by the entire project team. This paperless approach not only significantly decreases the handling costs of all parties, but improves quality control by reducing the potential errors that arise from miscommunication.

The other main focus with lean construction is moving to a more collaborative and optimized delivery method. In order to truly transform the industry, firms must improve how they interrelate with one another and collaborate when delivering a project. It can take some doing to develop a culture in which all the team members are willing to participate. It's a new mindset and way of doing business.

First of all, acknowledge that firms will behave based on the risk and reward equation. To make a cultural shift towards true collaboration, we must change the way firms are rewarded for their efforts. For example, let's say that if the plumbing subcontractor moved its staged material for a cost of \$1,000, the drywall subcontractor could realize labor efficiencies and save \$2,000. Clearly, if the two firms cooperated, the project would benefit. Unfortunately, in most cases today, the plumbing subcontractor's agreement would only create a disincentive for them to cooperate since they will not benefit from the cost savings. Negotiated agreements, partnering, design-build, and integrated project delivery represent various approaches to improving this situation, and when successful the benefits available through true collaboration can be enormous.



*Tools such as SharePoint and Bluebeam (above) increase productivity, for example tracking changes clearly to enable users to access current data from any location.*

The solutions don't need to be complicated or elaborate. Optimizing delivery is about motivating all team members to focus on what's in the best interest of the overall project and right for the customer. In order to achieve true alignment of goals, the contractual risk and rewards system needs to incentivize the desired behavior. For example, on a recent project, our mechanical and electrical subcontractor partners contributed a portion of their fee into an incentive pool. These dollars were paid out to the subcontractors at various milestones during the project depending upon how well they are achieving the mutually agreed upon project goals.



*Lewis uses Building Information Modeling and Virtual Design & Construction to preplan projects. This saves costly rework in the field and helps optimize construction efficiencies.*

Building Information Modeling (BIM) has rapidly gained broad acceptance in the industry. This tool provides the technology to build a construction project virtually, thereby eliminating conflicts and problems on the computer screen rather than in the field where the associated expense and disruption compromise a project's success. The tool's ability to eliminate waste from the traditional delivery process is truly impressive.

But even more efficiencies can be realized with BIM by focusing on how the teams collaborate in its use. Today, the curtain wall subcontractor submits shop drawings to assure his system meets the aesthetic intent, energy load assumptions and is coordinated with other design disciplines work. When conflicts occur, (and they often do) the project incurs additional expense and delays. These unpleasant surprises can be eliminated simply by incorporating the subcontractor's detailed information into the original BIM model.

We are poised for a revolution in construction. The opportunities for improvement are endless. Imagine projects without shop drawings, RFI's, change orders, claims, the need for value engineering, defects and injuries. All are achievable by implementing lean construction methods.



*Jeff Cleator is the Lease Crutcher Lewis commercial division manager and serves as chair of the Lewis Lean committee. He has built 3,000,000 (net) square feet of commercial buildings in Western Washington in the past decade alone and routinely beats aggressive budgets and schedules adding value and quality for both public and private clients.*