WHAT DOES LEAN REALLY MEAN?

Understanding lean construction & creating a plan for more profit

Presented by
Eddie Martinez
Corporate Safety Director, MCM

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Eddie Martinez is an executive at MCM, one of the fastest growing construction companies in South Florida. MCM is currently participating on a lean construction project in Miami, Florida. Martinez holds a bachelor’s degree in construction management from Florida International University and has more than 20 years of experience in construction.
Overview

+ Introduction
+ What “lean” means in construction
+ History of lean
+ The benefits of lean construction for your business
+ Lean construction principles you can apply
+ 45-minute presentation with 15 minutes for Q&A
Introduction

+ Eddie Martinez
+ 20 years in the construction industry
+ Director of a construction company
+ Degree in Construction Management
+ A passion for learning and helping others
What Does Lean Really Mean?

+ Lean construction is a set of principles and tools to facilitate planning and control, maximize value, and minimize waste throughout the construction process.
Why Lean?

The Lean Construction Principles help your project run efficiently and provide control measures which help limit the following:

- Schedule delays
- Poor quality
- Claims
- Change orders
What If…

+ Greatly reduce or eliminate
  > Change orders
  > Schedule delays
  > Claims
+ Improve predictability
  > Delivery date
  > Final cost
+ Improve safety and quality
The History of Lean

- Taiichi Ohno — Father of the Toyota Production System
- Eliyahu Goldratt
- Kaoru Ishikawa
- Joseph Juran
- Edwards Deming
- Total Quality Management (TQM)
- Theory of Constraints (TOC)
- U.S. Auto Industry Awoken To LEAN Manufacturing

- Just-In-Time (JIT)
- Continuous Improvement
- Respect for People
- 7 Types of Waste
- 5S Program

Timeline:
- 1950
- 1955
- 1960
- 1965
- 1970
- 1975
- 1980
- 1985
- 1990
Why Lean?

- Taiichi Ohno — Father of the Toyota Production System
  - Just-In-Time (JIT)
  - Continuous Improvement
  - Respect for people
  - 7 types of waste
  - 5S program
Some Lean History

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- U.S. Auto Industry Awoken To LEAN Manufacturing

- Toyota Production System “House”

Timeline:
- 1950
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History of Lean (Continued)

Lean Construction Institute

Last Planner System™
Construction teams start to use with great success.

Glenn Ballard & Greg Howell

Integrated Project Delivery (IPD)

Sutter's 5 Big Ideas

AGC Lean Construction Forum Created

The Toyota Way

- Started in 1920s building looms, then cars in the 1940s
- Describes the Toyota Production System (TPS)—Taiich Ohno
- Part of business philosophy known as the “Toyota Way”
- Uses various tools to support TPS
- Based on the 14 management principles
The Toyota Way

RESPECT FOR PEOPLE
- Respect
  - Respect others
  - Make every effort to understand each other
  - Take responsibility
  - Do our best to build mutual trust
- Teamwork
  - Stimulate personal and professional growth
  - Share opportunities for development
  - Maximize team and individual performance

CONTINUOUS IMPROVEMENT
- Challenge
  - Long term vision to meet challenges with courage and creativity to realize our dreams
- Kaizen
  - Improve business operations all the time by always trying for innovation and evolution
- Genchi Genbutsu
  - Go to the source to find the facts to make correct decisions and build consensus and trust
The Toyota Way - Highlights

+ Stop the process immediately
+ Note: If you would like to get this book for FREE, please send me a message
The Toyota Way Philosophy

Very different Mission Statement:

- Honor with fair and open corporate activities
- Respect other cultures and contribute to social & economic activities
- Dedication to clean and safe products that enhance the quality of life
- Creativity to develop new technology & products to fulfill the needs of the customer
- Foster a culture to support teamwork and trust
- Pursue growth and harmony
- Work to develop long-term partnerships
14 Management Principles

1. Base decisions on long-term goals
2. Create continuous flow process
3. Use “pull” system to avoid overproduction
4. Level out the workload
5. Build culture to stop and fix problems
6. Standardize tasks
7. Use visual controls
14 Management Principles

8. Use only reliable & tested technology
9. Grow leaders within the company
10. Develop exceptional people
11. Respect your suppliers & partners
12. Go see for yourself
13. Make decisions slowly & by consensus
14. Become a learning organization
What is Lean Construction?

Lean Construction is Philosophy and Practice:

+ Derived from the Toyota Production System
+ Focuses on elimination of waste, continuous improvement, and customer value
+ Can be incorporated using any contracting method
+ Internal to a project and/or a company
+ Requires a change in culture
The Construction Project Team

- Owner
- Architect/Engineer
- Vendors
- General
- Subcontractors
“The actual amount of time needed to progress from contract to completion for the typical home, if all of the relevant skills and materials were marshalled in the proper sequence, could be reduced from 6 months to 15 days using current construction techniques.”

- Womack & Jones 1996
What is Lean Thinking?

1. Understand VALUE from the customer’s perspective
2. Understand the VALUE STREAM – *All* steps in the process
3. Create FLOW by reducing waste
4. Use the principle of PULL
5. Endlessly pursue PERFECTION
The Lean Model

- Just-In-Time/Levelled production
  - Work floor layout
  - Set up times
  - Scheduling
  - Small lot sizing

- Involvement
  - Team work
  - Multifunctional workers
  - Quality leadership
  - Decentralized responsibility
  - Motivation

- Built-in quality/Continuous improvement
  - Waste reduction
  - Response to defects
  - Error proofing
  - Continuous improvement

- Stability and standardization
  - Work floor maintenance
  - Maintenance of equipment and tools
  - Visual information
  - Standardized work

Highest quality, lowest cost, shortest leadtime
The 5S – The Five Pillars

**SORT**
Clearly distinguish needed items from unneeded and eliminate the latter

**STRAIGHTEN**
Keep needed items in the correct place to allow for easy and immediate retrieval

**SUSTAIN**
Maintain established procedures

**STANDARDIZE**
The method by which “Sort,” “Straighten” and “Shine” are made habitual

**SHINE**
Keep the workplace neat and clean
The 5S - Construction

A clean, well-organized and safe work environment is, of course, an efficient and productive work environment.

• Everything On Wheels
• Nothing Hits the Ground
• Subcontractor Laydown Areas
• Continuous Cleaning
• Sustaining the Plan
What Do You See?

+ When you look at a construction project, an office, a fabrication shop...what do you see?
+ Lots of people busy working
+ Busy at what?
+ Activity = work + waste
The 3 Elements of a Day

Value Adding
Something changes to get closer to what the customer wants

Support Activity
Something we currently have to do but does not in itself add value for the customer

Waste
Transport
Inventory
Motion
Waiting
Over Process
Over Production
Defects
What Is Waste?

1. Overproduction
2. Waiting
3. Inventory
4. Movement
5. Effort
6. Rework of Errors
7. Processing

Under-utilized Talent
Last Planner

- Project Objective
- Planning the Work
- Should
- Can
- Trade Foremen
- Did
- Resources
- Construction
- Did
Weekly Work Plan

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Work that must be done before starting this task</th>
<th>Who will do the work?</th>
<th>When will the work be done?</th>
<th>Planned Activities Complete</th>
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<tbody>
<tr>
<td>Electrical first fix ground floor</td>
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<tr>
<td>Glass Delivery</td>
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<tr>
<td>Glaze ground floor</td>
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**Weekly Plan**

<table>
<thead>
<tr>
<th>Project/Client</th>
<th>Weekly commencing</th>
<th>Prepared by</th>
<th>Date Prepared</th>
</tr>
</thead>
</table>

**Notes:**
1. Late materials
2. Wrong materials
3. Other trade in work area
4. Pre前の activity not completed
5. Unplanned work
6. Labour shortage
7. Over estimation of what could be achieved
8. Task required rework
9. Late or incomplete information
10. Weather
11. Plant/tools unavailable
12. Other, please specify
Three-Week Rolling Program

Review Last Week

Discuss this week

Plan next week

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<tbody>
<tr>
<td>COMPLETE CONSTRUCTION DRAWINGS</td>
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<tr>
<td>PREPARE QUOTATION</td>
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<tr>
<td>ISSUE AS-BUILTS</td>
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<tr>
<td>COMPILE O&amp;M MANUAL</td>
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<td>CALL CLIENT TO FOLLOW UP QUOTATION</td>
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<td>OPEN PROJECT FILE</td>
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<td>1 AWAITING INFO FROM OTHERS</td>
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<td>A MCELWEE</td>
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Steps to Consider During Planning

+ Introduction to the Project
  > Background, target dates, milestones, critical paths
+ Program with target dates and milestones sign posted - Map the program in detail by the week
+ Challenge the program produced and re-juggle activities as necessary
  > Consider NEXT customer needs and wants
  > Consider work sequence and inter-trade impact
  > Can the program be realistically pulled back?
+ Capture key issues raised during the process for discussion and action
Collaboration Between the Teams
Collaboration

Weeks

Designer

Trades

Subcontractor

Architect
Continuous Improvement
Plan, Do, Check, Act

**Plan**
- Manage HERE!

**Do**
- Control the Method
- Measure HERE!

**Check**
- Incorporate Successful Improvements

**Act**
- Successful Improvements

**Inputs**
- Manpower
- Materials
- Machines
- Messages

**Outputs**
- Quality
- Cost
- Delivery
- Health & Safety

Trial Improvements on a Small Scale
Identify Opportunities
Example: Prefab Rebar Cages
Example: Prefab Rebar Cages
Example: Prefab Rebar Cages
Example: Prefab Rebar Cages
Lean Myths

+ The Japanese invented lean
+ Offsite manufacturing is lean
+ Lean means cutting everything to the bone
+ It’s a silver bullet
+ You need to use all the lean tools like value stream mapping, 5s, Single Minute Exchange of Dies (SMED), and just in time to be lean
The key to the Toyota Way and what makes Toyota stand out is not any of the individual elements...But what is important is having all the elements together as a system. It must be practiced every day in a very consistent manner, not in spurts.

Taiichi Ohno
Summary

+ Lean construction is a set of principles and tools to facilitate planning and control, *maximize value, and minimize waste* throughout the construction process.
+ Lean focuses on increasing flow by reducing waste
+ Collaboration
+ Continuous improvement
+ Plan, Do, Check, Act
+ Thank you
Keep in Touch

LinkedIn: linkedin.com/in/eddiejmartinez
Email: eddie_martinez@icloud.com
QUESTIONS?

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