How Lean Practices Represent the Future of Success in the Construction Industry

Speakers:
Steve Jones - McGraw Hill Construction
Patrick Mays, AIA - Dassault Systèmes
James Grossmann - Suffolk Construction
Jeff Esgar, CPC, LEED AP - Sundt Construction, Inc.
Mark Konchar, PhD, LEED AP, DBIA - Balfour Beatty Construction US
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Participants must:
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2. Attend at least 95% of the session.
3. Complete the post-program evaluation.
4. Complete a brief online assessment with a score of 75% of greater.

Detailed instructions on how to log into AGC Connection to complete the CEU process will be emailed to participants.

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Learning Objectives

By attending this session participants will be able to:

- Learn about the impact of taking a lean approach on a firm's productivity and profitability
- Gain an understanding of the challenges facing adoption of a lean approach
- Understand the skills and tools firms need to be able to successfully implement a lean approach
Agenda

• Lean Introduction and Research
• Three Contractors’ Lean Journey
  – Adoption, Implementation, Impact
• Q&A
Panelists

• Steve Jones, McGraw Hill Construction
Panelists

- Patrick Mays, AIA, Dassault Systemes
Panelists

• James Grossmann, Suffolk Construction
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- Jeff Esgar, CPC, LEED AP, Sundt Construction, Inc.
Panelists

- Mark Konchar, PhD, LEED AP, DBIA
  Chief of Enterprise Development
  Balfour Beatty Construction US

@markkonchar
Lean

LEARN
CONNECT
BUILD
### Few Contractors Have Implemented Any Lean Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th>48%</th>
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<th>23%</th>
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<tr>
<td>Lean Construction</td>
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<td>Pull Planning</td>
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Benefits Considered Achievable by the Contractors

- **Greater Productivity**
  Last Planner noted as specific tool for achieving this, but it does increase amount of upfront planning required.

- **Greater Profitability/Reduced Costs**
  Most noted some level of cost savings, but GCs caution that the owner often reaps the savings, and trade firms note that Lean tends to help them achieve a reliable profit margin on all projects, rather than a higher one on some.

- **Improved Safety**
  In addition to the safety benefits of prefabrication, the experts also site more predictable workflows, cleaner sites, improved ergonomics and better material handling as factors contributing to improved safety.

- **Greater Ability for Supervisory Staff to Focus on Managing Workers**
  Better upfront planning leads to fewer conflicts in the field. One trade firm notes a 60% increase in the ability of their supervisors to directly manage the labor force due to Lean.

- **Higher Quality Construction**
  Many firms agree that this is a benefit of Lean, but different respondents reference different causes: use of prefabrication, reducing rework, impact of increased collaboration, elimination of value engineering and a better understanding of customer expectations.

- **Greater Customer Satisfaction**
  A benefit more frequently cited by GCs, mostly attributed to the impact of other benefits like productivity, lower costs, increased quality and reliability.

- **Greater Reliability**
  One trade firm notes that reliability of outcome on their Lean projects is about 80-85%, up from 20% on traditional projects. Experts attribute this to better detailing, fabrication and preassemblies.

- **Reduced Project Schedule**
  Improved planning has a direct impact on schedule.

- **Better Risk Management**
  As with customer satisfaction, risk management is impacted by all the other benefits.
Lean Manufacturing vs. Lean Construction
<table>
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<tr>
<th>McGraw Hill Construction</th>
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| **Engineering News-Record (ENR)**  
Leading global construction industry magazine. |
| **Dodge**  
Leading source of data, forecast and analysis about global construction. |
| **Sweets**  
Leading source of information about building products. |
| **Architectural Record**  
Leading global architecture magazine. |
McGraw Hill Construction

SmartMarket Reports

[Image of various report covers]
Lean Construction research

• Completed October 2013
  – In-depth Interviews with General and Specialty Contractors

Download free digital copy of full report at: analyticsstore.construction.com
Top Benefits of Lean

- Improved Safety: 39% High, 38% Medium, 77% Achievement
- Greater Customer Satisfaction: 38% High, 42% Medium, 80% Achievement
- Higher Quality Construction: 36% High, 48% Medium, 84% Achievement
- Reduced Project Schedule: 34% High, 40% Medium, 74% Achievement
- Greater Productivity: 33% High, 44% Medium, 77% Achievement
- Greater Profitability/Reduced Costs: 30% High, 34% Medium, 64% Achievement
- More Focus by Supervisory Staff on Managing Workers: 25% High, 40% Medium, 65% Achievement
- Better Risk Management: 21% High, 50% Medium, 71% Achievement
- Improved Sustainability/Reduced Waste: 20% High, 47% Medium, 67% Achievement
- Greater Reliability of Information from Other Parties: 20% High, 46% Medium, 66% Achievement
- Improved Lifecycle Cost/Cost of Ownership: 9% High, 39% Medium, 48% Achievement
Lean Improves Profitability

- 72% GCs agree:
- 59% Trades agree:
Lean Improves Processes

Schedule Compression: 69% agree

Bidding Effectiveness: 65% agree

Enhanced Competiveness: 86% agree
## Lean Awareness


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<thead>
<tr>
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<th>Not Familiar With</th>
<th>Familiar With</th>
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<tbody>
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<td>Lean Construction</td>
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<td>Pull Planning</td>
<td>45%</td>
<td>19%</td>
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<td>Target Value Design</td>
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<td>Multi-Party Contracts</td>
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<td>Value Stream Mapping</td>
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<td>Big Room</td>
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<tr>
<td>Choosing by Advantages</td>
<td>64%</td>
<td>21%</td>
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Industry Efficiency Awareness

- Implemented Lean Practices: 62%
- Familiar with Lean Practices: 32%
- Not Familiar with Lean Practices: 14%

- Inefficient/Highly Inefficient: 40%
- Neutral: 19%
- Efficient/Highly Efficient: 26%

Graph showing:
- Construction Productivity (1964 = 100%)
- Non-Farm Productivity

AGC of America

95th annual Convention

Quality People. Quality Projects.
Lean and ERP Usage

Use an ERP
- Implementing Key Lean Practices: 51%
- Familiar With Lean Practices: 38%
- Not Familiar With Lean Practices: 11%

Weekly or Daily Meetings With Workers
- Uses an ERP: 94%
- Does Not Use an ERP: 58%

Offsite Prefabrication
- Uses an ERP: 89%
- Does Not Use an ERP: 73%

Optimizing Crew Sizes
- Uses an ERP: 82%
- Does Not Use an ERP: 82%

Just-In-Time Materials Delivery
- Uses an ERP: 71%
- Does Not Use an ERP: 58%

Training Workers With Preparatory Tools/Methods (e.g., Drills)
- Uses an ERP: 62%
- Does Not Use an ERP: 61%
Challenges to Lean

- Lack of Knowledge: 47%
- Lack of Sufficient Support Across the Project Team: 43%
- Perception That Lean Is Too Complex: 40%
- Employee Resistance: 40%
- Lack of Industry Support/Understanding of Lean: 39%
- Perception That Lean Will Take Up Too Much Time: 31%
- Lack of Standards: 19%
- Concerns About Profitability Through the Transition to Lean: 9%
- Union Reluctance: 5%
Suffolk Construction
Suffolk Construction

Transform the construction experience by building smart.
Adoption

- Projects becoming more and more complex
- Demand for delivering projects faster, of a higher quality and at a lower cost
- Identify a “smarter” way to build projects
Implementation

- **Pull Planning:**
  Just-in-time Approach

- **Target Value Design:**
  Establishing the Budget First

- **Co-Location:**
  Great Minds Working Together
Implementation

**Pull Planning:** Just-in-time Approach

- Create module
- 6-week make ready
- Consistent workforce (parade of the trades)
- Weekly work plan (creates REAL commitments)
- Lessons learned
Implementation

**Pull Planning**: Just-in-time Approach

- **Traditional**
  - CM
  - SUB
  - OWN
  - ARC
  - SUB

- **Pull Planning Approach**
  - OWN
  - CM
  - SUB
  - ARC
  - SUB

Photo of a pull planning meeting
Implementation

Target Value Design: Establishing the Budget First
Implementation

Co-Location: Great Minds Working Together

Traditional

Coordinated Location (Co-Lo)
Impact

• **Identified trends** immediately (modified schedule/methods accordingly)

• **Increased efficiencies and collaboration** (engaged subcontractors)

• **Produced less waste** (saved 13 weeks on MassArt Residence Hall schedule)

• Had **less interruptions on logistic and coordination issues**

• **Enhanced quality and improved safety**
Sundt Construction, Inc.
Sundt Construction, Inc.

Our People Make the Difference®

SUNDT
Adoption

An airplane trip one day, 8 years ago…
Implementation

- Pilot Project
  - Apollo Riverpoint
  - $121 Million
  - 10-story
  - (2) 6-story
  - (2) Parking garages
  - 37-Acre Site
  - Concrete, earthwork, utilities
Implementation

Oh Yeah!...we liked the results!
Implementation

- Lean Project Consulting (LPS)
- Subcontractor Seminars
- A/E Seminars
- Kaizen Committee
- Academies
- Lean Committee
- Lean Culture
Civil Implementation

2 Perspectives:
1. Contractor
   - Highways
   - Bridges
   - Major infrastructure

2. Subcontractor
   - Earthwork
   - UG Utilities
   - Paving
Civil Implementation

- Pull Planning (Baseline Schedule)
- Game Plan Meetings
- WWP’s
- PPC
Impact

• Early Project Delivery:
  – Apollo Riverpoint 10-story: 3 months early
  – BCBS: 3 months early
  – Henkel (Dial) Corporate HQ: $80 Million in 8 months

• Cost savings to owner
  – Apollo Riverpoint: $300,000 back to owner

• Safer projects:
  – Finished FY 2013 with lowest OSHA Incident rate in company’s 124 year history
  – Current FY OSHA rate at 0.75

FY14 OSHA Incident Rate
Balfour Beatty Construction US

**OUR PURPOSE**

To be a **Relentless Ally** for the success of each and every dream we are entrusted to build.
“Every system is perfectly designed to get the results it produces.”
Adoption

Zero Waste
Implementation

Lean

Owner defines value
See Waste
Culture of Improvement
Share widely
Implementation

Values Definition & Alignment

Exploration of Options

Plan Development & Production Management
Impact

- Zero Harm
- Client value
- Efficiency
- Talent, Time, Dollars
Q&A

• Top challenges
• Skills and tools needed
• How are you going to continue to develop lean?
• How will this impact our industry?