

# 97<sup>TH</sup> ANNUAL AGC CONVENTION

March 9-11, 2016

Grand Hyatt San Antonio | San Antonio, TX

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## Linbeck's Lean Journey

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THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA  
Quality People. Quality Projects.





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# agcleanforum.org

**Lean Construction Forum**  
Quality, Efficiency, and Expediency Through Collaboration

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THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA  
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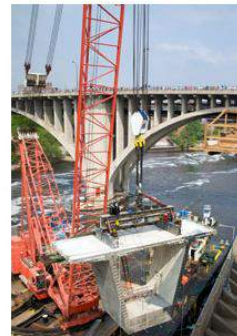
## AGC Lean news

[96th Annual AGC Convention: Lean Construction for Executives](#)  
[Speaker: Bill Seed, Walt Disney Imagineering](#)  
[Wednesday, March 18, 2:30pm – 4:00pm](#)

[Webinar: The Role of Communication in Supporting the Development of a Lean Culture](#)

[16th Annual Lean Construction Institute Congress – October 7-10, 2014 – San Francisco, CA](#)

[Lean Construction 101 Course Re-released!](#)



**96th Annual AGC Convention: Lean Construction for Executives**  
**Speaker: Bill Seed, Walt Disney Imagineering**  
**Wednesday, March 18, 2:30pm – 4:00pm**

Posted January 21st, 2015

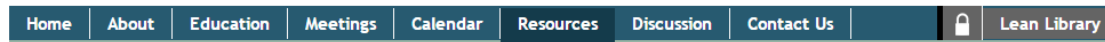
Are you looking to complete projects faster and at lower costs? Lean Construction is driven to minimize costs and maximize value on each project completed, challenging all stakeholders to



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[Webinar: Lean Problem Solving to Improve Contractors Operations](#)

[August 5, 2014 | 2:00PM - 3:30PM ET](#)

## Resources

ORGANIZATIONS	UNIVERSITIES	FIRMS PRACTICING LEAN	ARTICLES	PAPERS & PRESENTATIONS	WEBINARS
1	2	3	4	5	6

- [Seeing Value - Application of Lean Thinking to Construction](#)
- [Lean Construction from a Specialty Contractors' Perspective](#)
- [Lean Workstructuring - Perspectives from Miron and Boldt](#)
- [Three Lean Tools to Help Your Company be More Competitive](#)
- [Lean Construction in Practice Through "Real World" Applications](#)





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## Education

### Learn more about AGC's Lean Construction Education Program

AGC's Lean Construction Education Program will provide a comprehensive and practical look at Lean Construction practices examining the concepts pivotal to Lean Construction, including:

- Variation in production systems
- Pull in production
- Lean Workstructuring
- Lean supply chains and assembly
- The Last Planner® System
- Lean design and preconstruction
- Problem-solving principles and tools



For more details on the program content and structure visit the [Course Content and Credentialing page](#).

### Now Available

- **Lean Construction 101.** This one-hour online course provides a solid introduction for those in the construction community who are looking to gain knowledge and understanding of Lean Construction principles. This course is offered free to AGC members. (Temporarily under construction.)
- [Unit 1: Variation in Production Systems.](#) A four-hour in-seat course describes the different types of

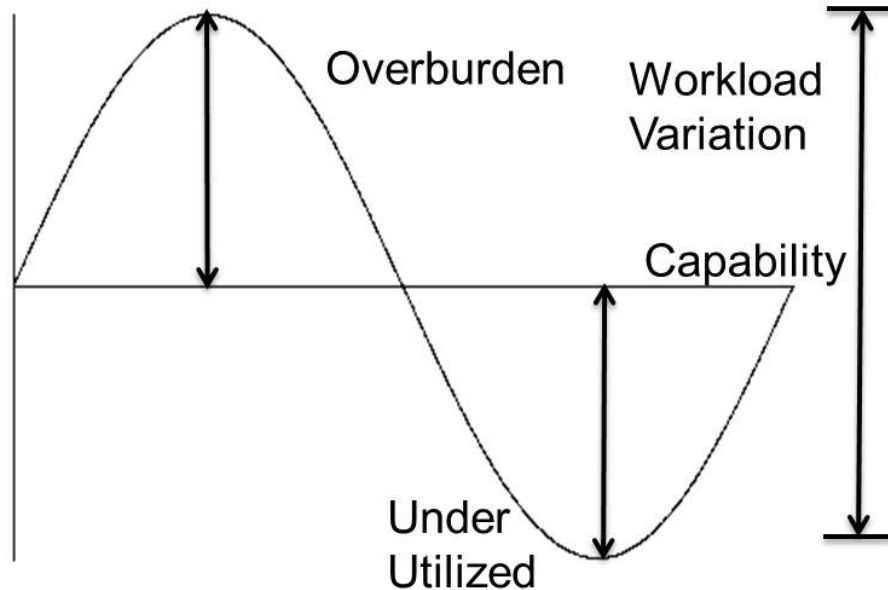


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## Why Lean?

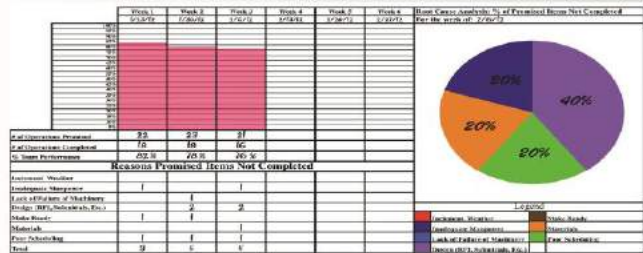
*The Problem: Variation      The Goal: Reliability*



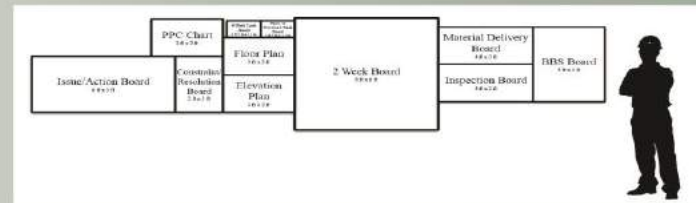
- Work waiting on people
- People waiting on work



## Linbeck's Lean Journey



1997	1999-2003	2004	2006	2008	2009	2012	2013	2014	2015
Linbeck was a charter member of the Lean Construction Institute	Developed company-wide, integrated value streams in support of TeamBuild®	Last Planner used company wide and established as dash board measurement	Hired first dedicated internal lean coach to institutionalize lean training as part of the Linbeck Academy	Linbeck was founding member of LCI Houston CoP	<p>Adopted Hoshin planning model for Linbeck annual business planning</p> <p>Created lean leaders group within Linbeck to propagate lean culture as grass roots movement</p> <p>Linbeck first chaired AGC Lean Construction Forum and development of education modules</p>	Company-wide adoption of "Lean Boards" as part of a Construction Big Room	Leo Linbeck III wins is awarded the 2013 LCI Pioneer Award which recognizes individuals who have moved the design and construction industry forward in embracing and implementing Lean tools and techniques.	Company wide War On Waste (WOW) which centers on publication and dissemination of short videos	Lean Leadership becomes an internal certification and is earned through demonstrated mastery known as "The Five Tests"



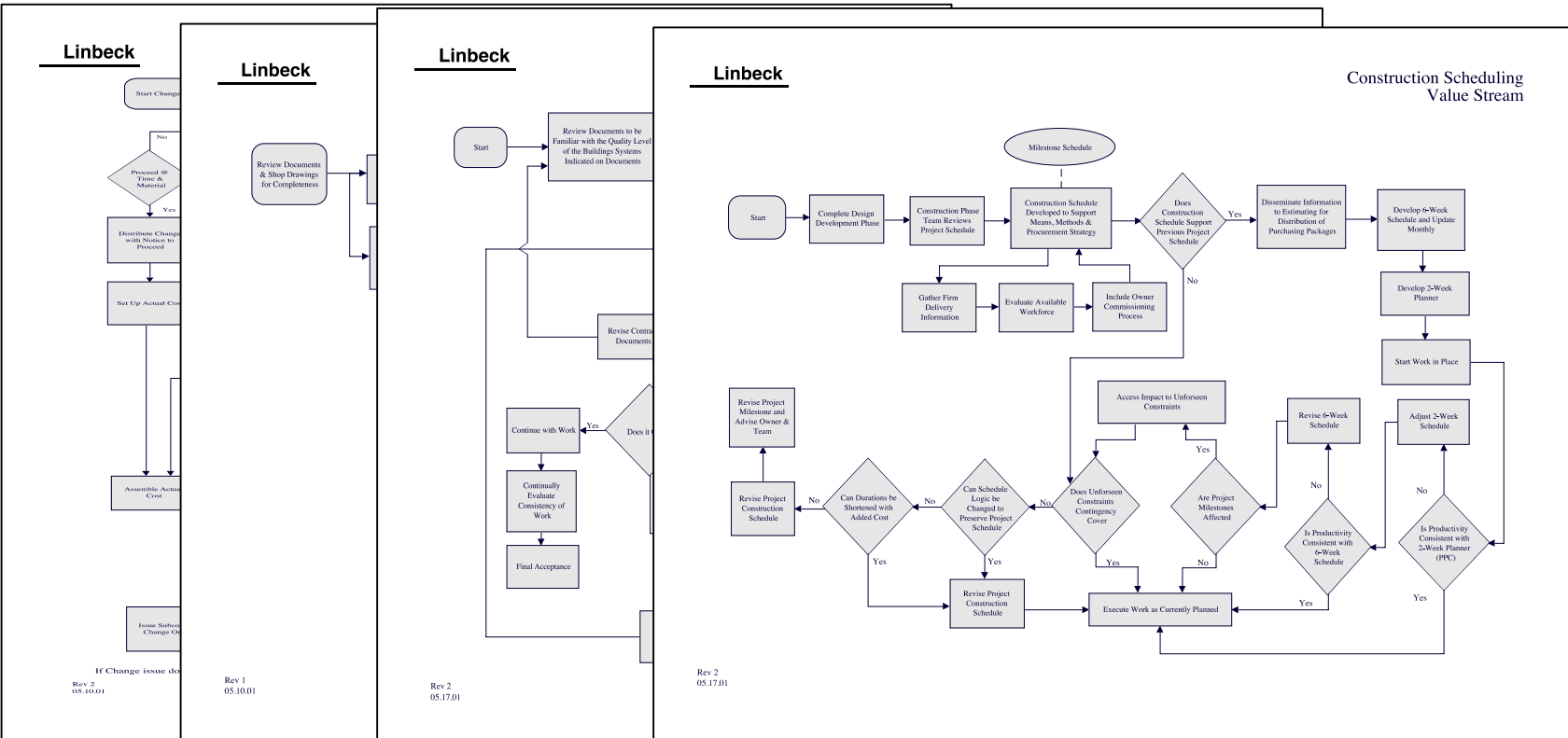




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## Early Efforts : Value Mapping / Value Streams





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## Early Efforts : Last Planner™

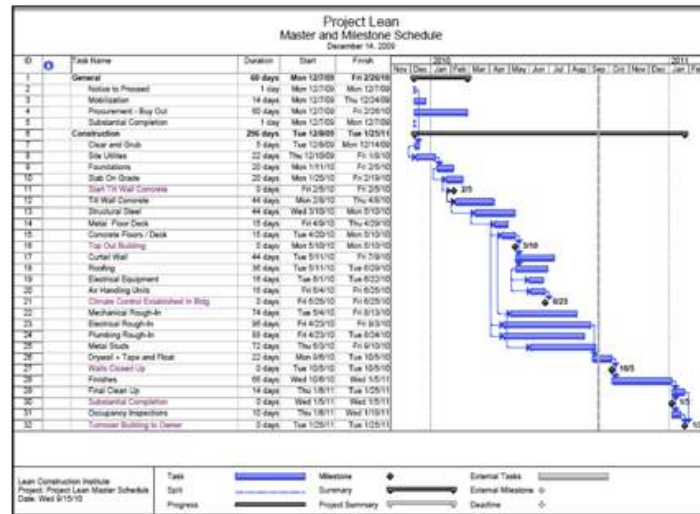
Master  
Schedule

Pull Phase  
Schedule

Six-Week  
Lookahead

Weekly  
Workplan

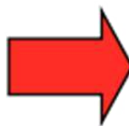
Percent  
Planned  
Complete



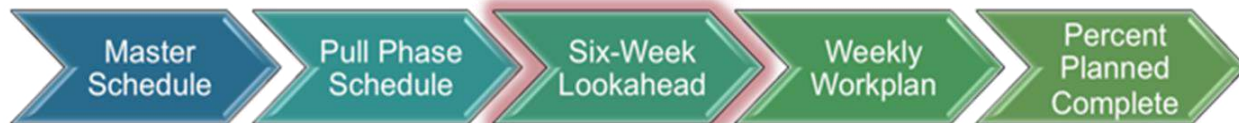




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Master  
Schedule

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Schedule

Six-Week  
Lookahead

Weekly  
Workplan

Percent  
Planned  
Complete

## LINBECK

ACH Child & Family Services Phase 1B - Part 1

Weekly Work Plan

Company: Waddell Excavating		PPC: Why task is not complete															Milestones	
Prepared Barclay		1. Environmental (Mother Nature, job site limitations, unforeseen conditions)																
		2. Manpower (Availability of the necessary number, skills, etc.)																
CRE:		3. Machine (Availability and/or working capability of Cranes, Equipment, Tools, Computers)																
DAT 11/02/2010		4. Methods (Schedule Logic & Accuracy, coordination including design, Safety process /Tasks, etc.)																
		5. Make ready (Another's Required Handoff is not ready on time due to rework or another cause)																
		6. Materials (Availability of Raw, Semi-finished, Components, etc.)																
		PPC	PPC	Week 1							Week 2							
				week of							week of							
No.	TASKS	%	#	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Mon	Tue	Wed	Thur	Fri	Sat	Sun	Constraints
	GUARD ENTRANCE																	
	Wreck forms			X														
	Demo and dispose concrete/binder				X													Electrical Sleeves
	Grade and install forms					X	X											
	Pour curbs							X										
	Install binder									X								
	Install topping										X							
	Backfill Islands											X						Relocation of fence
	Demo and excavate carton forms @ BLDG												X	X				
	ARCHES																	
	Submittal approval forms and steel			X	X	X	X	X										
	Form columns						X				X	X	X					
	Install Steel										X	X	X					
	Inspect and pour columns												X	X				
Workable Backlog																		
Rear Drive		7 how clearance and 13 remaining(Utility relocation)																
Light poles																		

7 low clearance and 13 remaining (Utility relocation)





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Master  
Schedule

Pull Phase  
Schedule

Six-Week  
Lookahead

Weekly  
Workplan

Percent  
Planned  
Complete

## LINBECK

# of Tasks: 12

# Completed: 9

PPC for Previous Week: 75%

Week of: 06/21/10

To: 06/27/10

Item #	Priority	Task	By When	Anticipated % Complete	Constraints	Complete
1	A	Prepare Kick-Off Meeting Notes	6/22/10	100%		Yes No
2	A	Prepare Board Meeting Notes	6/22/10	100%		Yes No
3	A	Schedule CMD Hayward Baker Administration Foundation Meeting	6/23/10	100%		Yes No
4	A	Send out all Subcontracts for 1976	6/23/10	50%	Waiting on team to do Internal Review	Yes No
5	A	Obtain 1976 Permit	6/25/10	50%	Negotiations with HDH and Waddell	Yes No
6	B	Resolve Asphalt Road Issue	6/25/10	50%	Awaiting Urban Forestry approval	Yes No
7	B	Setup Subcontractor Welcome Meetings	6/25/10	100%		Yes No
8	B	Schedule HVAC Repair Under Chapel	6/25/10	50%	Negotiate terms with Commercial Interiors	Yes No
9	C	Order Copy Machine	6/25/10	100%		Yes No
10	C	Order Materials for Gideon Tol Amphibian Stage	6/25/10	100%	Awaiting direction from Michael Blakemore	Yes No
11	C	Follow up with Michael about 1976 Owner Contract	6/25/10	75%		Yes No
12	C	Upload Submittal Log In Endive	6/25/10	50%		Yes No
						Yes No



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## Problem: Inconsistent Adoption @ Jobsites

- Management of paperwork is tedious
- Lean packets become outdated shortly after the meeting
- Meetings are too long
- Not enough emphasis on root causes for work not completed
- System is not visual
- Communication with Subcontractors difficult



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## Our Goal: Better Commitments

- Better Communication with/between trade partners
- Visual/Up to Date: Schedule, Constraints, Material Deliveries, Inspections, Action Items
- Improved accountability between Linbeck and trade partners
- Less paperwork/Less man-hours for meeting preparation
- Shorter Meeting Durations





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## Our Response: Management by Site/Visual Controls





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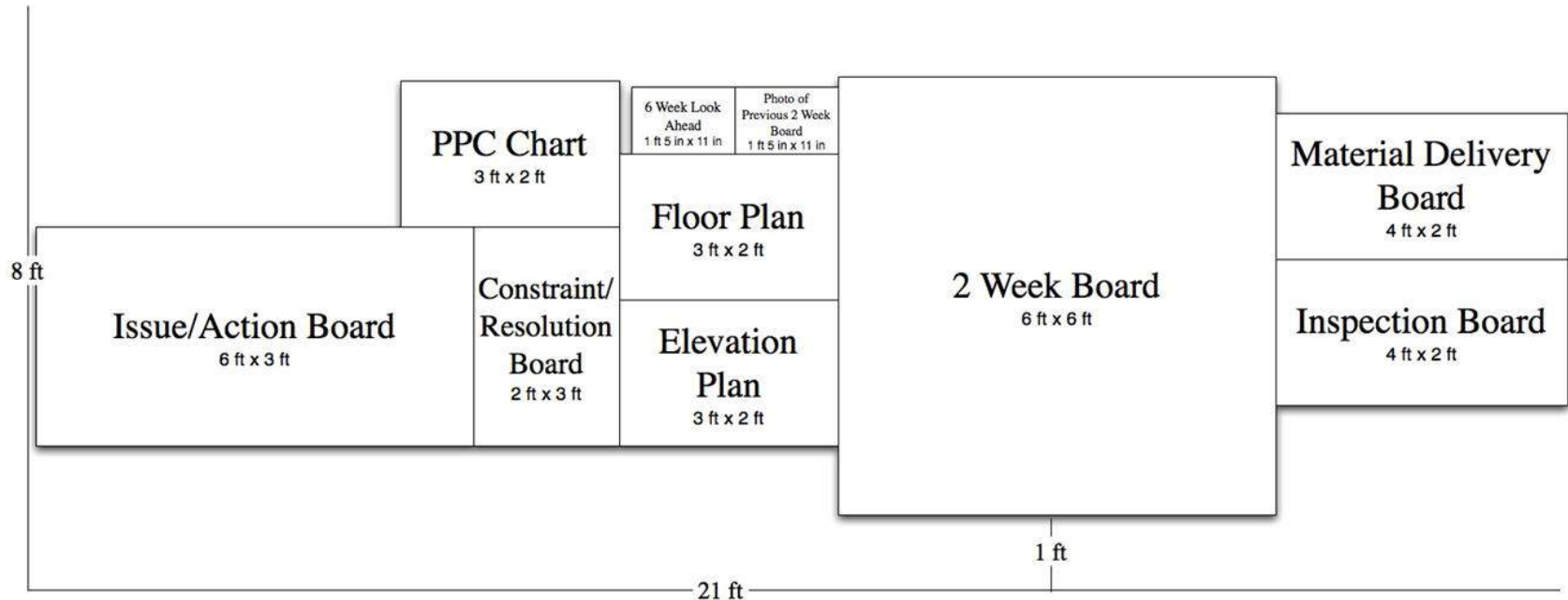




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## Lean Boards @ Jobsites





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## Lean Boards @ Jobsites

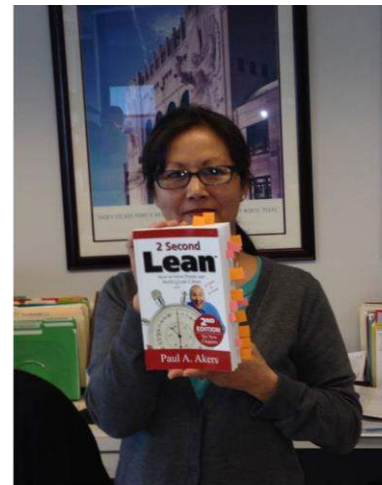




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## War On Waste (WOW) Videos







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## Grass Roots & Organic Growth

### *Lean Leaders: The Five Tests*



- 1-WOW Video Per Quarter
- Master Lean Boards and make one improvement
- Teach 1 AGC Lean Unit
- Teach 1 Supply Chain Workshop
- Present on Lean at University, LCI Community of Practice, or conference



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agc.org

- Learn
- Education & Training
- Lean Construction

## Education & Training

National Programs & Events

Safety Training

Supervisory Training

Building Information Modeling

Lean Construction

CM-Lean

LCEP Project Team Course

Lean Construction Forum

CM-Lean Holders Directory

Project Management

Continuing Education

TED Forum

Construction Data

Education and Research Foundation

Resource Library

## Lean Construction Education Program

SHARETHIS



Watch this video to learn what participants are saying about AGC's credentialing program and find out how you can earn your own certificate.

Everyone related to the construction process has incentive to get the project done faster and at a lower cost - from the project owners who want to see tangible results for their investment to the contractors and designers who want to do their job well and move on to the next project. Lean Construction is based on the holistic pursuit of continuous improvements aimed at minimizing costs and maximizing value on a construction project: planning, design, construction, activation, operations, maintenance, salvaging, and recycling.

To help contractors develop the knowledge needed to build lean, the Associated General Contractors of America developed the Lean Construction Education Program.



Now Available on:

amazon.com



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CM-LEAN  
CERTIFICATE OF  
MANAGEMENT  
LEAN CONSTRUCTION



- 4,669 attendees since inception
- 1,711 total attendees in 2015
- 13 Linbeck instructors added in 2015
- 7 passed the CM Lean beta exam



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EDUCATION PROGRAM



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## Sundt's Lean Journey



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Quality People. Quality Projects.





## Why Lean?



- Lean focuses on maximizing the whole NOT on maximizing individual performance
- Maximize Value + Reduce Waste
- Improve processes to be more competitive
- Provides consistency throughout company



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## Why Lean ?

- Toyota's Goal

“Give customers what they want,  
deliver it instantly, with no waste.”



Toyota Plant – San Antonio, TX







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## Why Lean ?

- It brings solutions!





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Test pilot LPS at  
Apollo RiverPoint



Lean Expectations set at  
Executive Level

Lean Seminars



Sundt Academies  
PMs, Superintendents, Engineers,  
Precon

2005

2006

2007

2008

Train the Trainer  
Grass roots implementation



LPS included in  
'Instructions to Bidders'

LPS incorporated  
into Subcontracts

Operational & Corporate  
Value Stream Mapping

Sundt Lean Committee



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## Buy in at the Executive Level

- ✓ Driven by the CEO
- ✓ Key people sent to LCI Congress for 1<sup>st</sup> hand view of Lean – What are we getting into?
- ✓ Provided resources for success
- ✓ Hired 3<sup>rd</sup> party Lean consultant







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## Test Pilot Projects Apollo RiverPoint & Butler WWTP

- ✓ Pilot projects selected for implementing LPS <sup>TM</sup>
- ✓ Used 3<sup>rd</sup> party consultant
- ✓ Pilot project team trained on LPS <sup>TM</sup>





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## Train. Train. Train...

- ✓ Lean Seminars
  - ✓ Subcontractors/Sundt
  - ✓ Owners/Architects/Sundt Preconstruction
- ✓ Train the Trainer
- ✓ Sundt Academies
  - ✓ PM, PS, PE, Preconstruction
  - ✓ Self-perform groups
- ✓ Attended Lean Conferences
  - ✓ Lean & Infrastructure - UCLA Berkeley
  - ✓ Lean UK Congress – Manchester, England
  - ✓ Lean Congress – San Francisco & Mumbai, India
  - ✓ Lean Design Congress - Chicago
  - ✓ Benchmark Session with Vision Alliance - Helsinki, Finland



***And when your done...train some more***



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## Incorporated Lean in Subcontracts

- ✓ Instructions to Bidders
- ✓ Subcontract language section 8.3

**8.3 Lean Construction.** Contractor will employ lean construction principles on this Project.

**8.3.1 Use of the Last Planner System™.**

- .1 The Last Planner System™ ("LPS") is a lean production-based project planning and management system developed by the Lean Construction Institute.
- .2 Subcontractor shall actively participate in the implementation and use of lean construction principles and Last Planner System on this Project. At a minimum, Subcontractor shall (a) attend LPS scheduling meetings in addition to normal weekly subcontractor coordination meetings, (b) regularly submit Weekly Work Plans, and (c) attend and participate in pull planning sessions as required by Contractor.



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Establish Kaizen  
Committee

Sundt Way/Best Practices  
Ideas@sundt.com

1<sup>st</sup> Kaizen Director  
1 year full time rotating position

Change Management  
Model  
The Kaizen Process



2009

2010

2011

2012

Companywide Training  
Consultant  
Mastering Change &  
Achieving Results

Introduce A3  
Form

Company Presentations  
Introduce Kaizen Process  
Focus on high impact ideas



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## Submitting Ideas

- ✓ Collecting ideas from employees companywide & posting in a central location
- ✓ Ideas reviewed by Committee
- ✓ Communicating decisions

**Nº 004027**

**Continuous Improvement  
(CI Form)**

---

Shared ideas to do things  
Better...Cheaper...Faster...Safer.

Submittal Date \_\_\_\_\_

Name \_\_\_\_\_

Position \_\_\_\_\_

Division \_\_\_\_\_

CI Champion \_\_\_\_\_

Project/Dept. \_\_\_\_\_

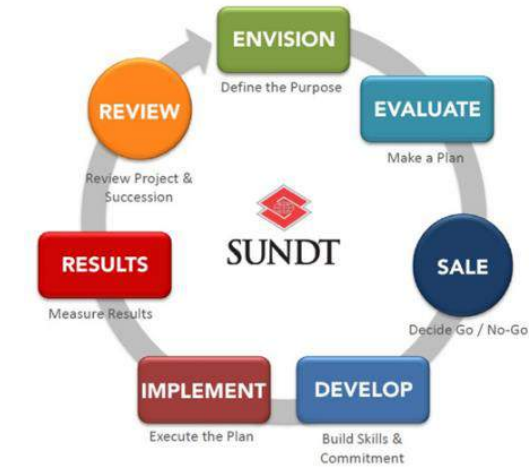
**\*IDEA** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*Idea may be selected for company recognition awards.

Date: \_\_\_\_\_ **Nº 004027**



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## Training on Mastering Change & Achieving Results

- ✓ Hired 3<sup>rd</sup> party change consultant
- ✓ Develop Sundt's Change Management Model
- ✓ Develop process to evaluate ideas
- ✓ Encouraged the use of lean tools (A3, Value Stream Mapping)

The image shows a sample A3 Report form, which is a structured template for problem-solving and continuous improvement. It includes sections for:

- 1. CHALLENGE**: Define the Problem (Situation)
- 2. GOAL**: Define the Purpose (Objective)
- 3. ANALYSIS**: Define the Plan (Strategy)
- 4. ACTION**: Define the Plan (Action)
- 5. EVALUATION**: Define the Plan (Evaluation)
- 6. SUMMARY**: Define the Plan (Summary)

The form is divided into columns for "Current Situation", "Target Situation", and "Action Plan". It includes a header for "Project Name" and "Project Manager".





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## Dedicated Director

- ✓ Dedicated resource to lead the charge
- ✓ Growth opportunity as a rotating position



- ✓ More ideas being implemented
- ✓ Opportunity to pursue high impact ideas



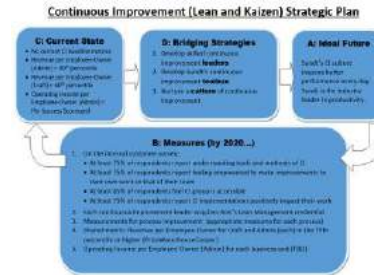
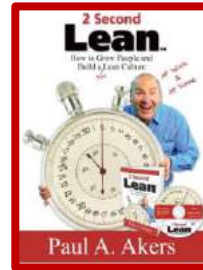
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LPS mandatory for all Sundt projects

Kaizen Director  
position extended  
2 year tour

Introduce 2  
Second Lean



CI Strategic  
Plan is  
implemented

2013

2014

2015

'Continuous Improvement'  
movement is created

2014 Lean Summit

Corporate Director of CI  
permanent full time position

AGC Lean  
Training Sessions

CI  
Leaders  
are  
identified



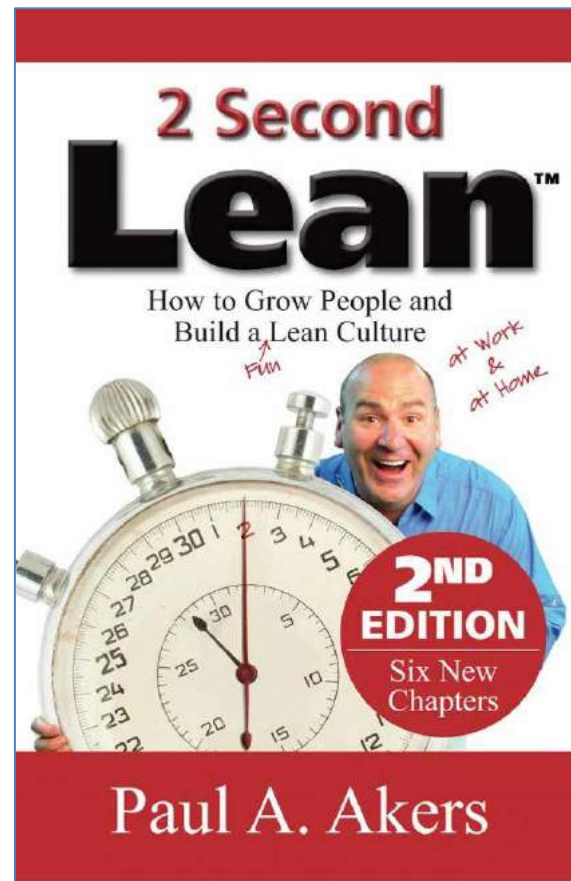


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## 2 Second Lean

- ✓ Small incremental improvements
- ✓ Empowering employees - making improvements within their scope of influence
- ✓ 5 S's being utilized at the enterprise and project levels
- ✓ Books presented to all Admin employees
- ✓ Presented at orientation





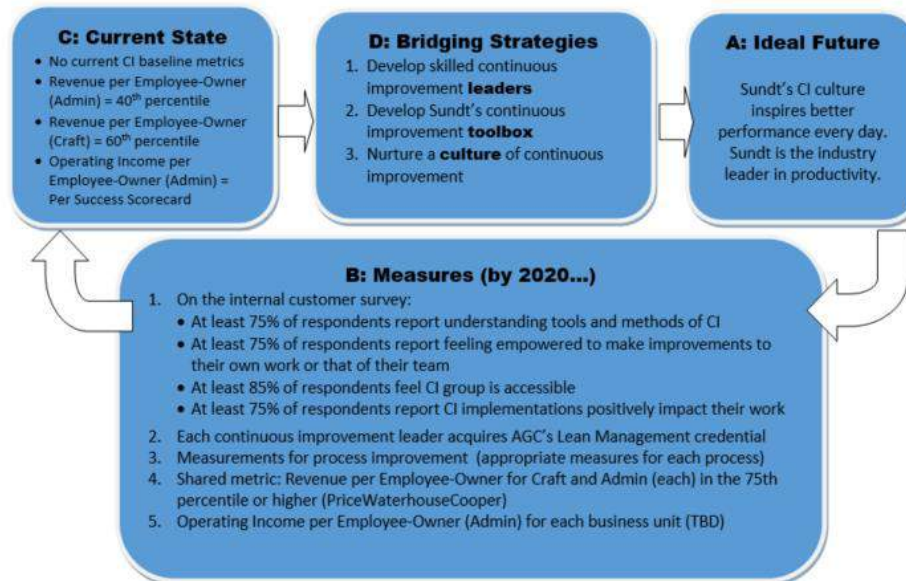


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## Develop a Strategic Plan

### Continuous Improvement (Lean and Kaizen) Strategic Plan





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## AGC Lean Certification

- ✓ Identified employees companywide that were passionate about improvement
- ✓ Develop lean knowledge & skills; taking that experience & putting it to use
- ✓ 29 employees participated in initial training
- ✓ 17 employees eligible to take exam



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## 2016 and beyond

17 CI Leaders earned AGC's  
Certificate of Management  
Lean Construction CM-Lean



2<sup>nd</sup> group of CI  
Leaders start AGC  
Lean training



CI Leaders start  
improvement projects





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## Crossing Divisional Lines



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### Lean Construction in the Utility and Infrastructure Industry

By: Andrew Apostolik  
Group Engineer, Civil Group  
Sundt Construction, Inc.

#### Purpose

Lean construction methods can play an important role in improving the success of companies involved in the Utility and Infrastructure (UI) markets. Lean methods provide significant commercial benefit and practitioners are able to achieve greater influence in managing their business. The implementation of Lean construction promotes continuous improvement, provides a framework for managing risk, increases reliability of team commitments and minimizes waste. Basic Lean implementation is focused on proactively identifying waste, optimizing resource utilization and provides simple forward looking measurement tools. Implementation of Lean construction methods reduces conflict, rework and uncertainty in a challenging industry. This is accomplished by achieving team commitment to schedules, establishing the conditions of success for handoffs to downstream work and promoting a culture of trust supported by measurement. Finally, implementation of Lean methods grows people by creating a leadership culture which strives to identify and implement productive change.

Applying Lean to horizontal  
construction!

[www.agcleanforum.org](http://www.agcleanforum.org) < resources  
< Papers and presentations



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Don't give up...it's a continuous journey!



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## Q&A



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