

Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

This course is registered with **AIA CES**



Copyright Materials

This presentation is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speaker is prohibited.



JEDUNN®
CONSTRUCTION



Course Description

This session will bring awareness of Lean Construction and how it maximizes efficiencies to deliver the best value to customers. We will discuss how projects are delivered through Lean Construction and help the audience understand how Lean can benefit the delivery of their construction projects.



A Lesson in Lean Construction

Elizabeth Taylor

JE Dunn Construction

Lean Services Manager

Curtis DeLaquil

JE Dunn Construction

Senior Project Manager



Learning Objectives

Participants will be introduced to

- ✓ The Advantages of Lean over the Traditional Method
- ✓ Importance of Creating a Lean Culture on a Project
- ✓ Some of the Lean Tools used in Design and Construction

Current State



How the Customer explained it



How the Project Leader Understood it



How the Engineer designed it



What the contractor actually built



What the Customer really wanted

Fix it Now and Fix it Fast

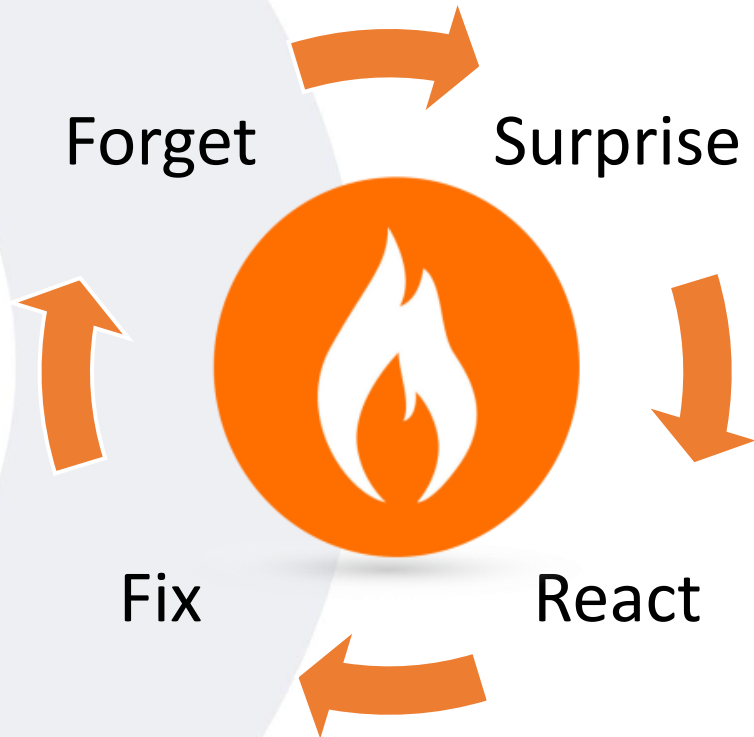
The Dooming Cycle

Our Industry is addicted to expediency

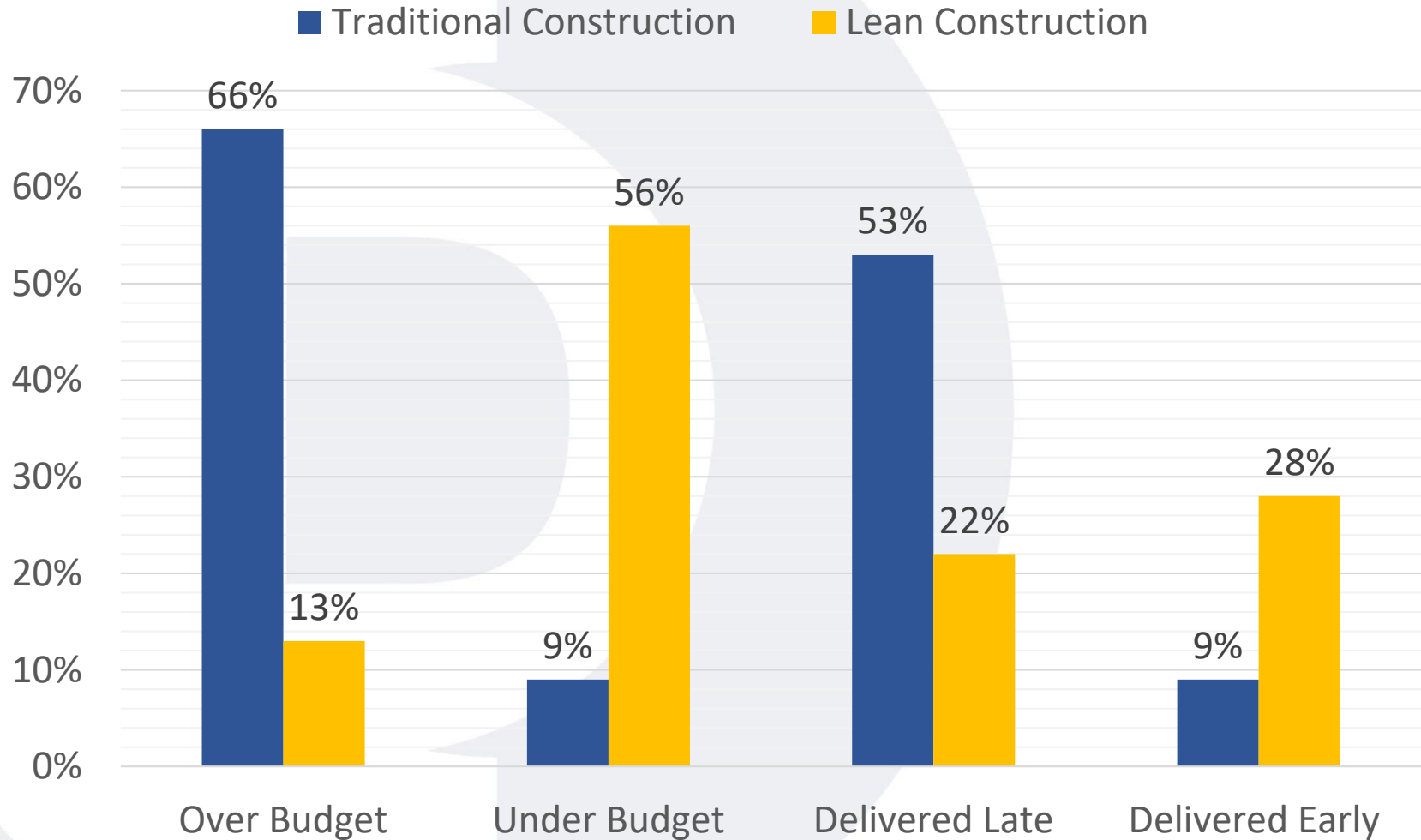
- See the problem
- Fix the problem
- Next problem

Learning

- No time for learning
- Reiterative cycle
- Constant fire fighting of the same fires



Why Lean Construction?



Source: Dodge Analytics Survey, 2015
Funded by: LCI, DBIA, CURT, COAA, AGC

Lean is not...

~~Pull
Planning~~

~~Something
we can
copy~~

~~Set of
Tools~~

~~Process~~

~~Speed
and
efficiency~~



~~LEAN~~

Lean Construction



Delivering
VALUE
effectively



CUSTOMERS

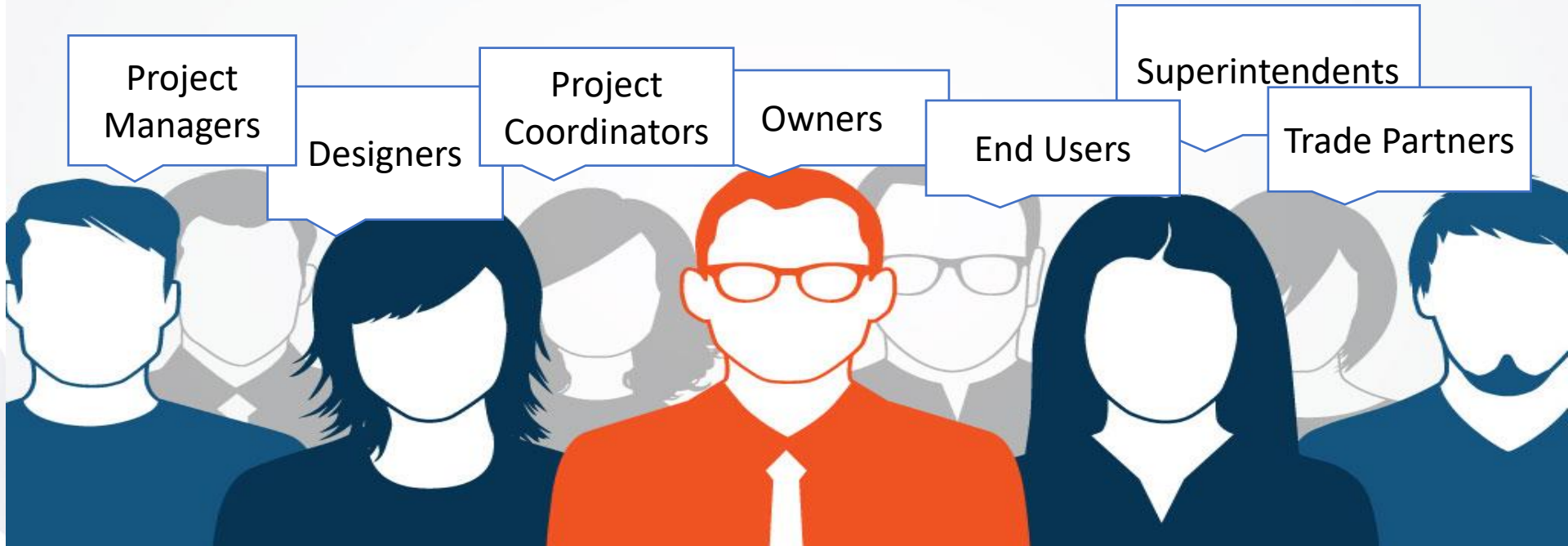


RESPECT FOR PEOPLE



CONTINUOUS IMPROVEMENT

Who are our Customers?



Lean Construction Principles



Lean Projects Require a mind shift

Traditional Behaviors

Leadership
dictates direction.

Planning
is **partitioned** by trades and disciplines and is linear. It is then used as a tool to manage the project.

Management
controls are inflexible and defined by leaders – processes and measures are fixed, generally based on history.



Lean Behaviors

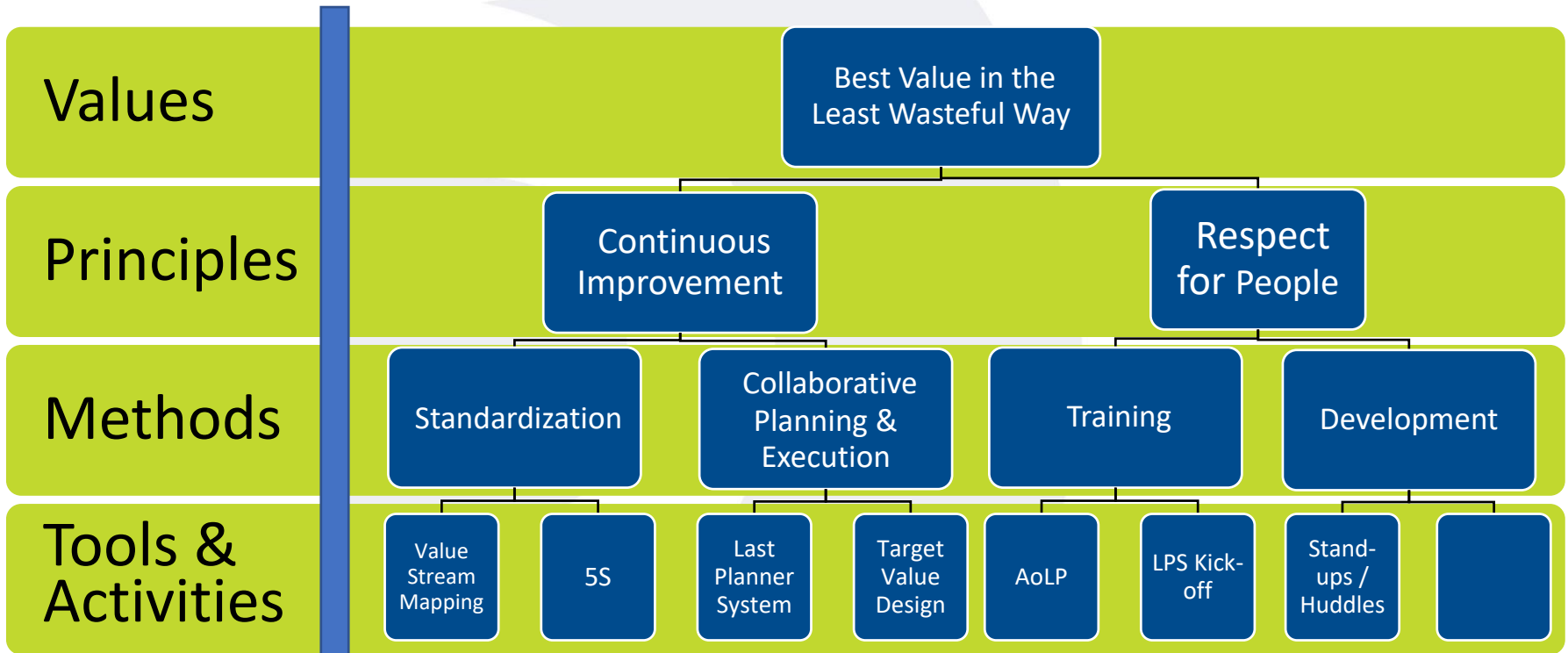
Leadership
facilitates collaborative direction.

Planning
is **collaborative**, project based and seeks to work together to eliminate negative iterations. It learns as the project evolves.

Management
develops a “network of commitments” to implement the plan, evolves intelligence, measures are integrated and proactive.

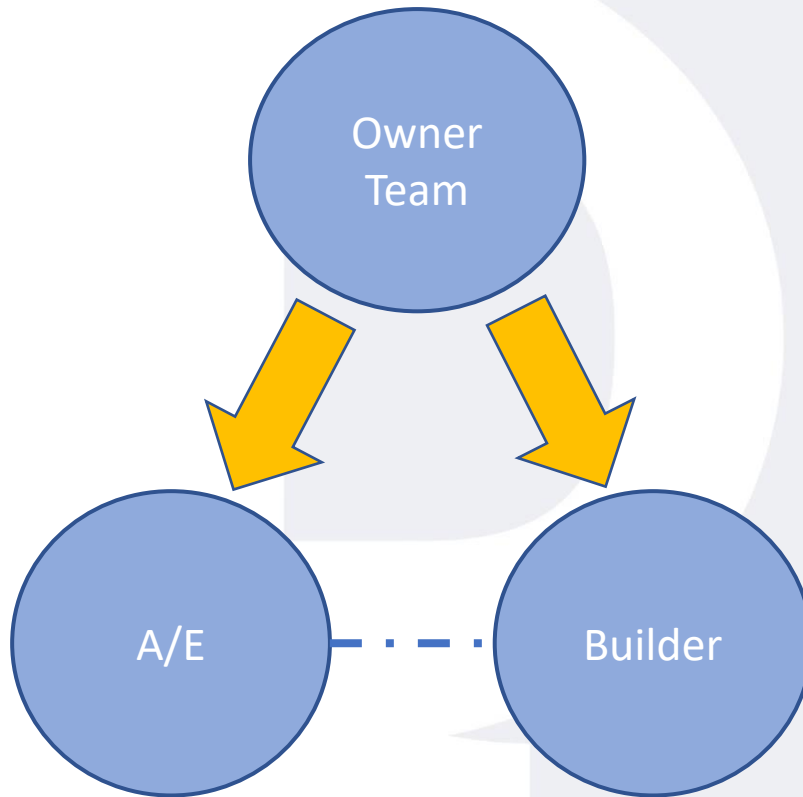
Lean at JE Dunn

Harder to understand



Easier to understand

Traditional Systems



- Restricted Communication
- Risk flows down
- Redesign / rework rampant
- Adversarial relationships
- Leadership dictates
- Push processes

Target Value Delivery

A disciplined management practice to be used throughout the project to ensure the facility meets the operational needs and values of the users, the project is delivered within the allowable budget, and innovation is promoted throughout the process to increase value and eliminate waste.



Engage Deeply with the Client to establish the Target Value

- What is the significance of this project to the end user?
- What does it mean for their future?
- How will the project enhance the owner's ability to achieve more of the organization's goal?

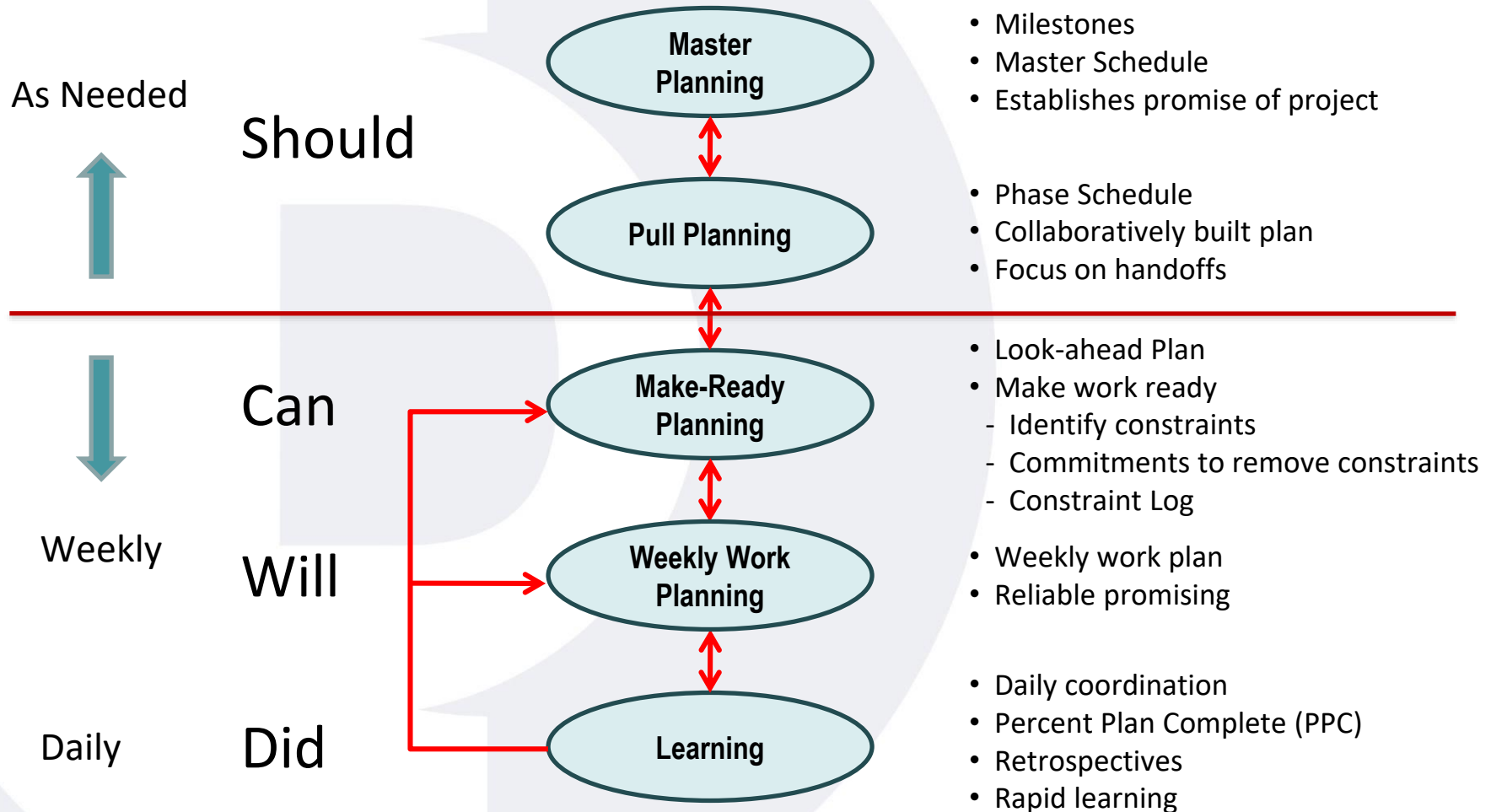


PRICE
IS WHAT YOU PAY
VALUE
IS WHAT YOU GET

WARREN BUFFETT

Last Planner® System in Design and Construction

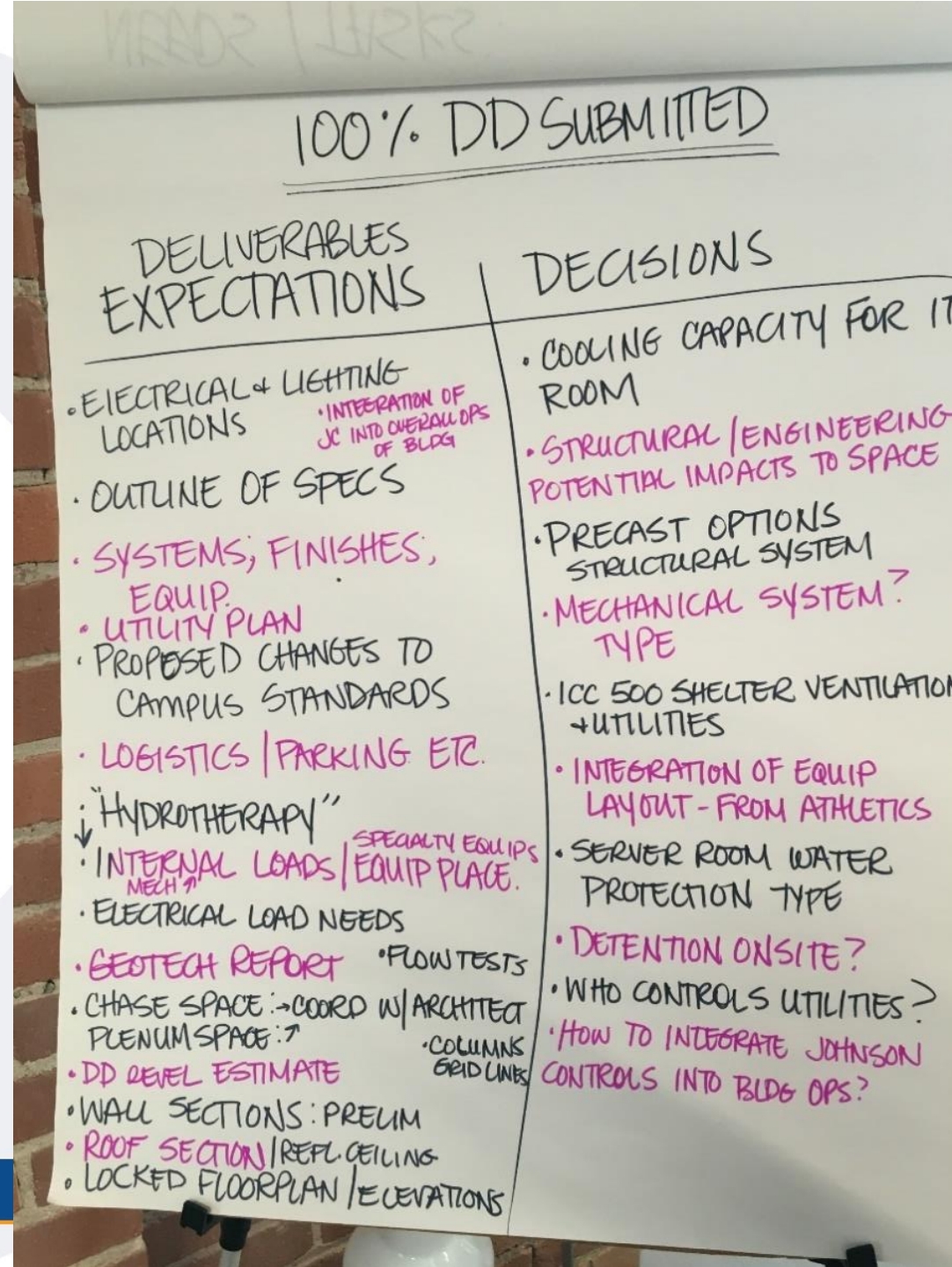
Should-Can-Will-Did Planning



©2012 Lean Project Consulting, Inc

Milestone Definition

- Identify and define assumptions
- Clearly define deliverables & expectations of a milestone
- Remove wasteful tasks that bog the schedule down





Pull Planning

What

A collaboratively built plan that starts with the milestone completion and works backwards, focusing on the hand-offs

How

- Includes all Last Planners and Project Managers from trades involved in the milestone
- Shows only the tasks associated with that

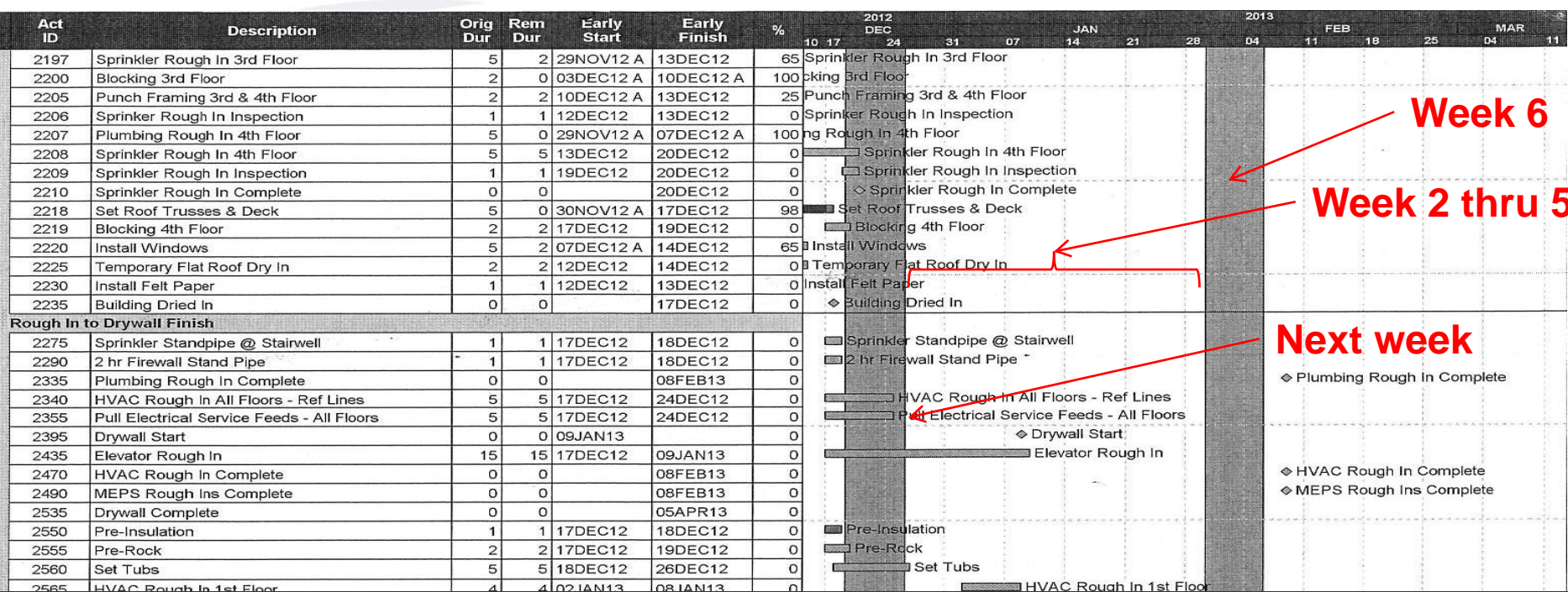
Why

Coordination amongst the day to day planners; a detailed plan to build the project with the most efficient path

Desired Outcome of Pull Planning



- Reduce uncertainty and confirm the plan
- Reduce variability and create reliable workflow
- Establish a coordinated Plan of Action amongst the team
- Improve milestone delivery date
- Identify the handoffs within the milestone
- Understand details of the sequence and logic to meet project milestones



Make Work Ready Planning

What

Making work ready for the workers, and the workers ready for the work

How

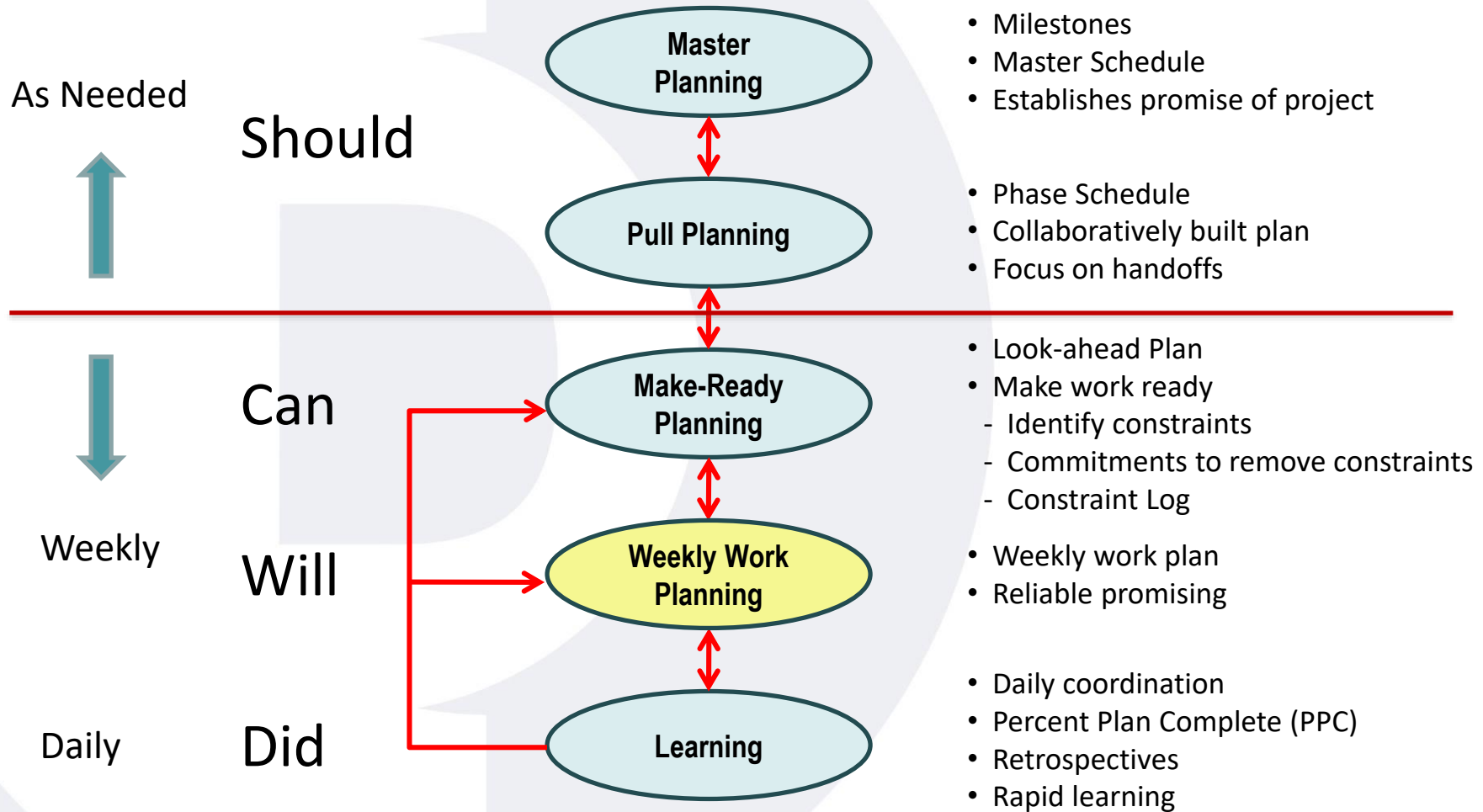
Looking 6 weeks out to identify the constraints and assign champions to make sure they are removed to make the work ready.

Why

Making work ready allows for reliable workflow and predictability in the field.

Last Planner® System in Design and Construction

Should-Can-Will-Did Planning



Weekly Work Plans

When will it be done?

What & Where?

Who will do it?

							Manpower Total	12	12	12	10	8	0
Trade Partner	Activity #	Area	SOW	Floor	Commitment Description		Responsible Party	M	T	W	T	F	S
BARDI	1	South Wing	HVAC	Basement	Install new HVAC duct in ADA & gang restrooms		Denis					2	
GAYLOR	2	South Wing Renovation	LV, Lighting, Power	Level 1	Install new fire alarm cable		Todd					2	
GAYLOR ELECTRIC	3	South Wing Renovation	LV, Lighting, Power	Level 1	Install temporary fire alarm loop to trailers		Todd	2					
GAYLOR	4	South Wing Renovation	LV, Lighting, Power	Level 1	Demo existing fire alarm		Todd	2	2	2			
GAYLOR	5	South Wing Renovation	LV, Lighting, Power	Level 1	Demo existing fire alarm		Todd			2	2		
GAYLOR	6	South Wing Renovation	LV, Lighting, Power	Level 1	Run power to flush valves in ADA 1505		Todd	2					
BARDI	1	South Wing	HVAC	Level 2	Install new HVAC duct in ADA & gang restrooms		Denis	2	2				
BARDI	2	South Wing	HVAC	Level 1	Install new HVAC duct in ADA & gang restrooms		Denis			2	2		
MGS	1	South Wing Renovation	Drywall ceiling/Metal stud	Level 2	Frame drywall grid ceiling in gang restrooms		Romero	2	2	2			
MOCK PLUMBING	5	South Wing Renovation	Plumbing	Level 2	Install hangers for wall mounted fixtures		Alvin			2			
MOCK PLUMBING	6	South Wing Renovation	Plumbing	Level 2	Install hangers for wall mounted fixtures		Alvin			2			
MOCK PLUMBING	7	South Wing Renovation	Plumbing	Level 2	Install hangers for wall mounted fixtures		Alvin			2			
MOCK PLUMBING	8	South Wing Renovation	Plumbing	Level 2	Receive fixtures/assemble lavatories		Alvin				2		

Crew Size ?



Learning

What

Measuring how reliable the teams plans are and making improvements based on the impacts.

How

Daily Stand ups, Tracking percent planned complete, variances, root cause and having regular Retrospectives

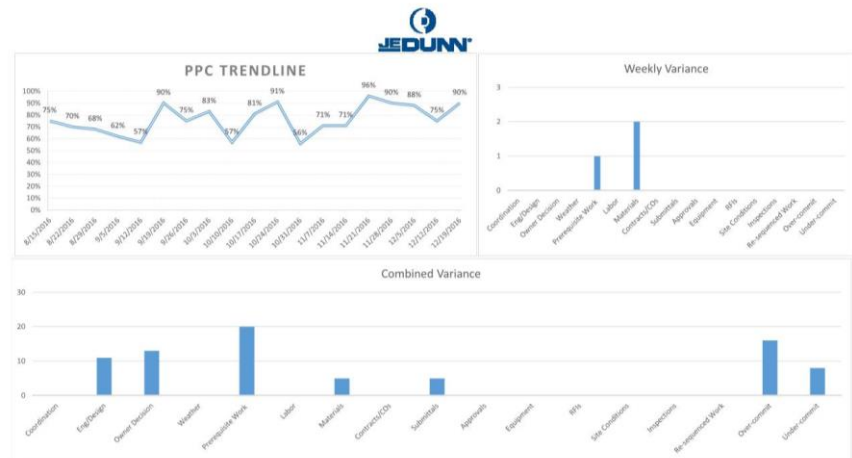
Why

Learn from our plan variances so we can continuously improve as a team.

Learning/Check

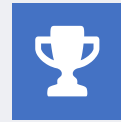
DAILY STANDUP MEETINGS

- + I got this done since last stand-up
- + I'll get this done by the next
- + Let's replan where necessary
- + How can we prevent this from happening again?



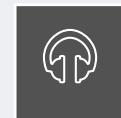
The Last Planner System Principles

Plan in greater detail as you get closer to doing the work.



Make and secure reliable promises.

Produce plans collaboratively with those who will do the work.



Learn from breakdowns.

Reveal and remove constraints on planned tasks as a team.



Structure the work to achieve smooth workflow.

Goals of Lean Construction



Achieve optimal project duration by creating and maintaining reliable workflow.



Produce the appropriate level of quality the first time, eliminating defects and rework



Eliminate all wastes including accidents and injuries, increasing value to the customer while reducing costs

Learning Objectives

Participants will be introduced to

- ✓ The Advantages of Lean over the Traditional Method
- ✓ Importance of Creating a Lean Culture on a Project
- ✓ Some of the Lean Tools used in Design and Construction

This concludes The American
Institute of Architects
Continuing Education Systems
Course

Lean Construction

Elizabeth Taylor - JE Dunn
Construction

Curtis DeLaquil- JE Dunn
Construction

Elizabeth.Taylor@jedunn.com

Curtis.DeLaquil@jedunn.com