

LEAN CONSTRUCTION

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TODAY'S AGENDA

- Lean Principles
- Lean Principles Uses in Construction
- Using the Last Planner System™

SUFFOLK CONSTRUCTION OVERVIEW

#41

ranking on Engineering News-Record's (ENR) national 2013 **"Top 400 Contractors" list**

32
YEARS

in business as a **financially sound and privately-held** contractor

\$3
BILLION

aggregate bonding capacity, with single project capacity of \$450 Million.



1,200 STRONG

#6

ranking on South Florida Business Journal's **Top Contractors list**

20
YEARS

in **South Florida with over \$3 billion of work put in place**

\$1.2
BILLION

of construction in **downtown Miami** in the past five years

HISTORY

LEAN PRODUCTION SYSTEM



Taiichi Ohno

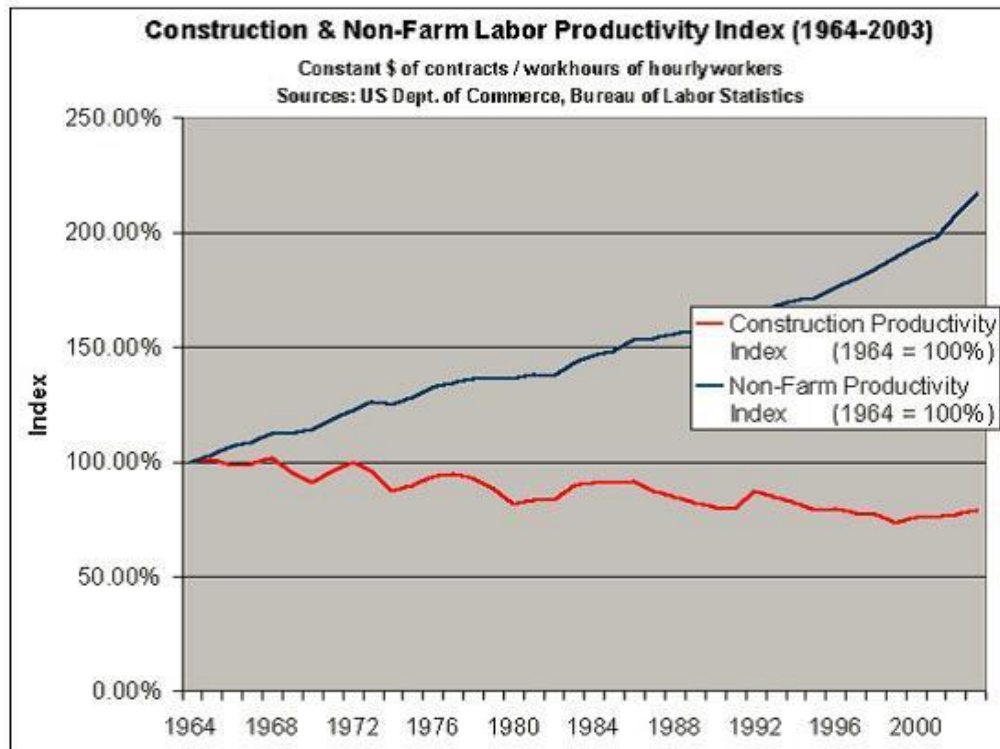
- **Born out of the manufacturing industry**
 - 5 Whys Concept
- **Developed Toyota Production System**
 - Based on Underlying Principles
 - Continuous Improvement “*Kaizen*”
 - Respect for People/Teamwork
 - Reducing Waste

OUR LEAN FOCUS

“To produce the **right product** at the **right time** in the **right quantity** for the customer and to produce exactly what you need and nothing more.”

Taiichi Ohno, Creator of the Toyota Production System

WHY LEAN IN CONSTRUCTION



- Productivity Levels in Construction have consistently fallen since 1964
- 70% of Budgets and Schedules are missed
- Teamwork Unreliability

WHY LEAN IN CONSTRUCTION

IT'S ABOUT REDUCING WASTE.

Get the Idea?



WHY LEAN IN CONSTRUCTION

IMPROVE CURRENT SCHEDULE RELIABILITY

OB3 1ST ELEVATED PARKING DECK 80'

1B2333	Form Columns and Sheer Walls- Block B (OB3)	5	01-06-2016	01-12-2016
1B2334	Pour Columns and Sheer Walls- Block B (OB3)	2	01-13-2016	01-14-2016
1B2340	Place Shoring from 0'0" to Elevated Parking Deck 80' - Block B (OB3)	45	01-15-2016	03-17-2016
1B2335	Form Elevated Parking Deck- Block B (OB3)	5	03-18-2016	03-24-2016
1B2336	MEP in Elevated Parking Deck- Block B (OB3)	2	03-25-2016	03-28-2016
1B2337	Rebar in Elevated Parking Deck- Block B (OB3)	3	03-29-2016	03-31-2016
1B2338	Pour Elevated Parking Deck- Block B (OB3)	5	04-01-2016	04-07-2016
1B2342	Concrete Cure Time- Block B (OB3)	20	04-08-2016	05-05-2016
1B2341	Remove Shoring from 0'0" to Elevated Parking Deck 80' - Block B (OB3)	30	05-06-2016	06-17-2016

- Work Expands to fill time or *Pushing*
- Work Hand-Off is not reliable
- Dates and Durations are determined by few
- Work production is not steady

LAST PLANNER SYSTEM

LAST PLANNERS USE THE LAST PLANNER SYSTEM®

Production Planning

SHOULD

PHASE SCHEDULING

CAN

LOOKAHEAD PLANNING

WILL

WEEKLY WORK
PLANNING

DID

DAILY CHECK-IN

Last Planners ...

Pull workflow and hand-offs

Builders plan crew flow
Identify and remove constraints

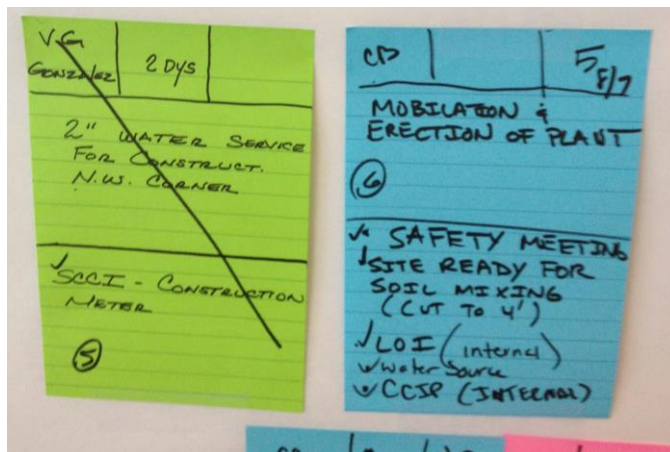
Make reliable promises to deliver
next week's work

Measure PPC for previous day
Confirm today
Remove obstacles for tomorrow

LAST PLANNER SYSTEM

IT STARTS WITH PULL PLANNING...

- The right process will produce the right results
 - **Working from a target completion date (milestone) backwards, tasks are designed and sequenced so that their completion releases work.**
 - Build a culture of stopping to fix problems, to get quality right from the first.



LAST PLANNER SYSTEM

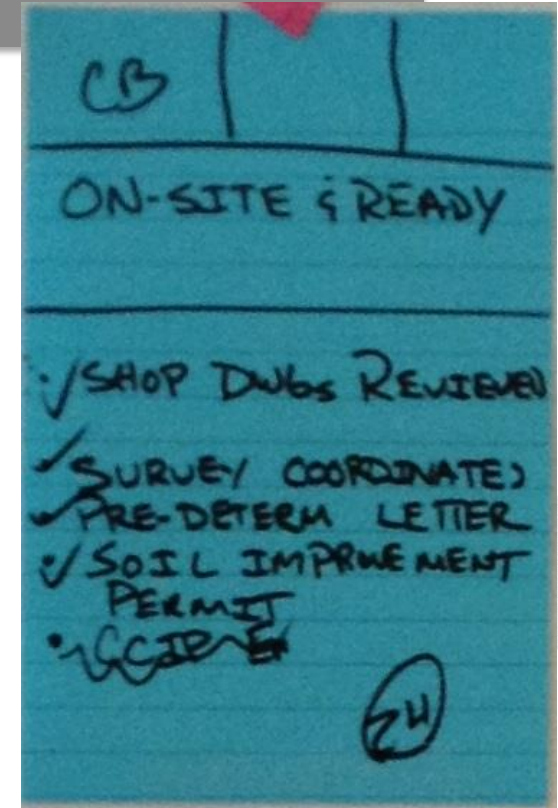
HOW DOES PULL PLANNING WORK?

- Planning based in conversation about requests and promises between last planners.
- Work is planned at the “request” of a downstream “costumer.” The “performer” of the work makes a promise with agreed to “Conditions of Satisfaction”.

LAST PLANNER SYSTEM

MAKING REQUESTS

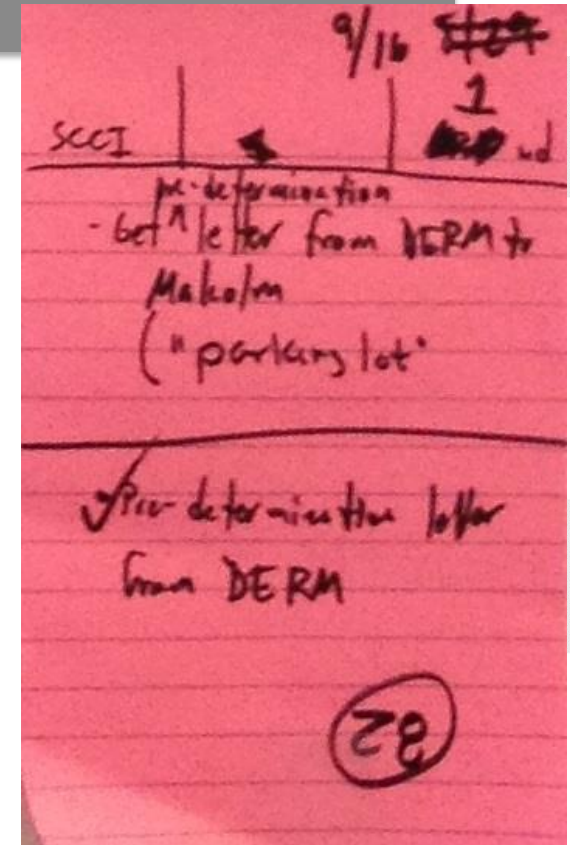
- **ELEMENTS OF COMPLETED REQUEST**
 1. CUSTOMER
 2. PERFORMER
 3. TIME FRAME
 4. CAN YOU DO WHAT YOU SAY (TOOLS, MATERIAL)
 5. **MUTALLY UNDERSTOOD CONDITIONS OF SATISFACTION**



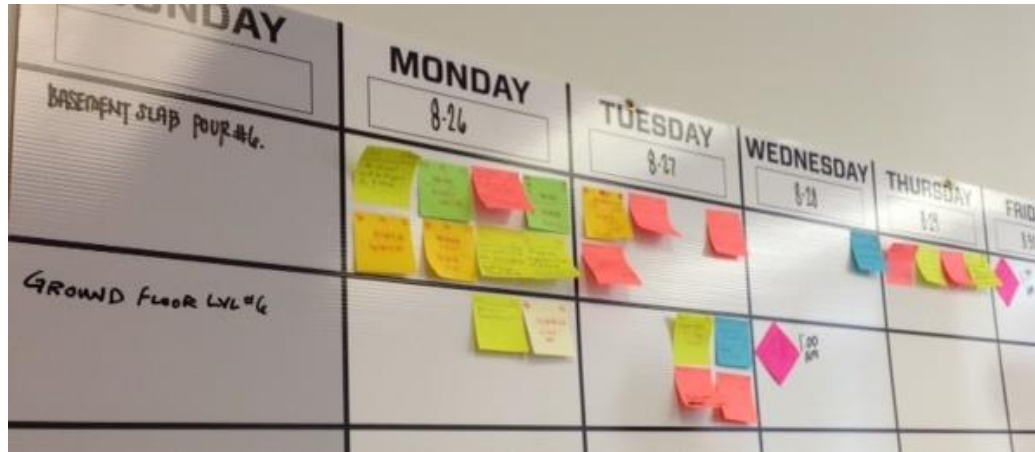
LAST PLANNER SYSTEM

RESPONSES TO REQUESTS

- **POSSIBLE RESPONSES TO REQUESTS**
 1. ACCEPT
 2. DECLINE
 3. COUNTER OFFER (YES IF...NEGOTIATE TO YES)
 4. COMMIT TO COMMIT LATER



LAST PLANNER SYSTEM



PULL PLANNING STEPS

- Determine the completion dates for the phases
- Using team scheduling and “stickies” on a wall board, develop the swim lanes required to complete the phases working backwards from the milestone date.

LAST PLANNER SYSTEM



PULL PLANNING STEPS

- Re-Examine the logic to try to shorten the duration
- Determine the Earliest Practical Start Date

LAST PLANNER SYSTEM

Weekly work plan

project: _____
 Stage: _____
 area: _____

Week commencing: _____
 Company: _____
 Prepared by: _____
 Date prepared: _____

ref	Task description	Final MakeReady needs	who will do work	Period to perform the task							PPC analysis	
				M	T	W	T	F	S	S	Y	N
	Criteria for release of assignments: defined, sound, ordered, sized	Work that must and can be performed prior to the release of this task										

NOW WHAT?

Continuous Improvement

1. Weekly Work Plan

- Transfer Stickies and Commitment Dates to Weekly Work Plan
- Monitor Progress and task completion through Check in sessions/Daily Stand-up Meetings
- Re-Pull as needed

LAST PLANNER SYSTEM

DAILY STAND-UPS TO TALK

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

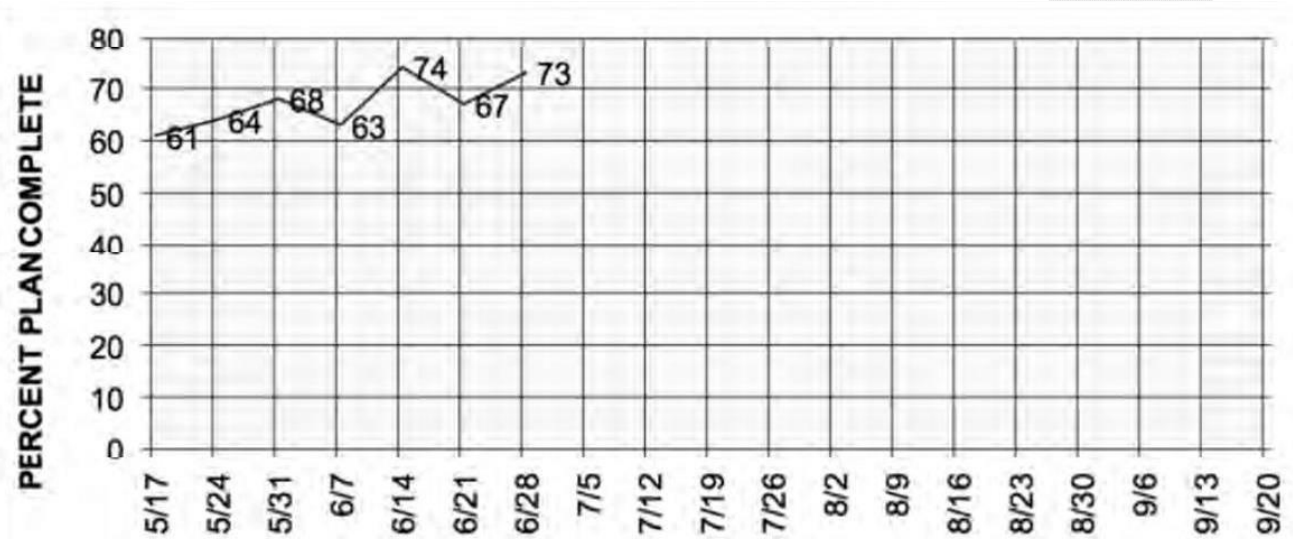


LAST PLANNER SYSTEM

PPC = PLANNED % COMPLETE

No partial – Either 100% or not

PPC = # of tasks completed as scheduled/
of tasks planned for completion



CONTINUOUS IMPROVEMENT

PLUS/Delta

+

Δ

