





**NORTHWEST  
CONSTRUCTION  
CONSUMER  
COUNCIL**

# Overview of the Last Planner<sup>®</sup> System



**March 20, 2018**

By

David Umstot, PE



# The Current State (for some)

Phoenix Project Manager Professional - [Chemical Processing Plant Master 2013-04-08.ppx]

File Edit View Insert Format Tools Schedule Info Window Help

Format

Determine criticality by:

Total Float  
At most 0 days of total float

Path Float (Longest Path)  
At most 0 days of path float

ID	Description	Original Dur	Actual Dur	Start	Finish	FF	TF	Path Float
PH1820	Install Owner Furnished Fire Extinguishers	2	0	10/28/13	10/29/13	26	26	26
PH1094	Install Overflow Piping	19	0	11/08/13	12/04/13	0	0	0
PH1762	Install Controls	10	0	11/11/13	11/22/13	0	-6	8
PH1840	Final Punchlist	10	0	12/05/13	12/18/13	0	0	0
PH1860	Start-Up & Test	10	0	12/05/13	12/18/13	0	0	0
PH1880	Final Clean-up	5	0	12/19/13	12/25/13	13	13	13
PH1900	Commissioning & Owner Acceptance	15	0	12/19/13	01/08/14	0	0	0
PH1920	Paving Repair & Landscaping	5	0	12/19/13	12/25/13	6	6	6
PH1940	Anticipated Substantial Construction Completion	0	0		01/13/14	0	0	0
PH1960	Contractual Substantial Construction Completion	0	0		02/03/14	0	0	0
PH1980	Final Construction Completion	0	0		02/23/14	0	0	0

Activity Editor

ID: PH1762 Description: Install Controls

Start: 11/11/2013 Finish: 11/22/2013

Type: Task Constraint: Finish no later than 11/15/2013

Original Duration: 10 Remaining Duration: 10

Percent Complete: 0.00 On Schedule

Calendar: Unnamed

Default Layout Update #4 - 2012-03-01 317 of 317 activities visible

SHOCKWAVE TRAFFIC JAMS  
RECREATED FOR FIRST TIME

Footage courtesy of  
University of Nagoya,  
Nagoya, Japan

# The Big Room Concept

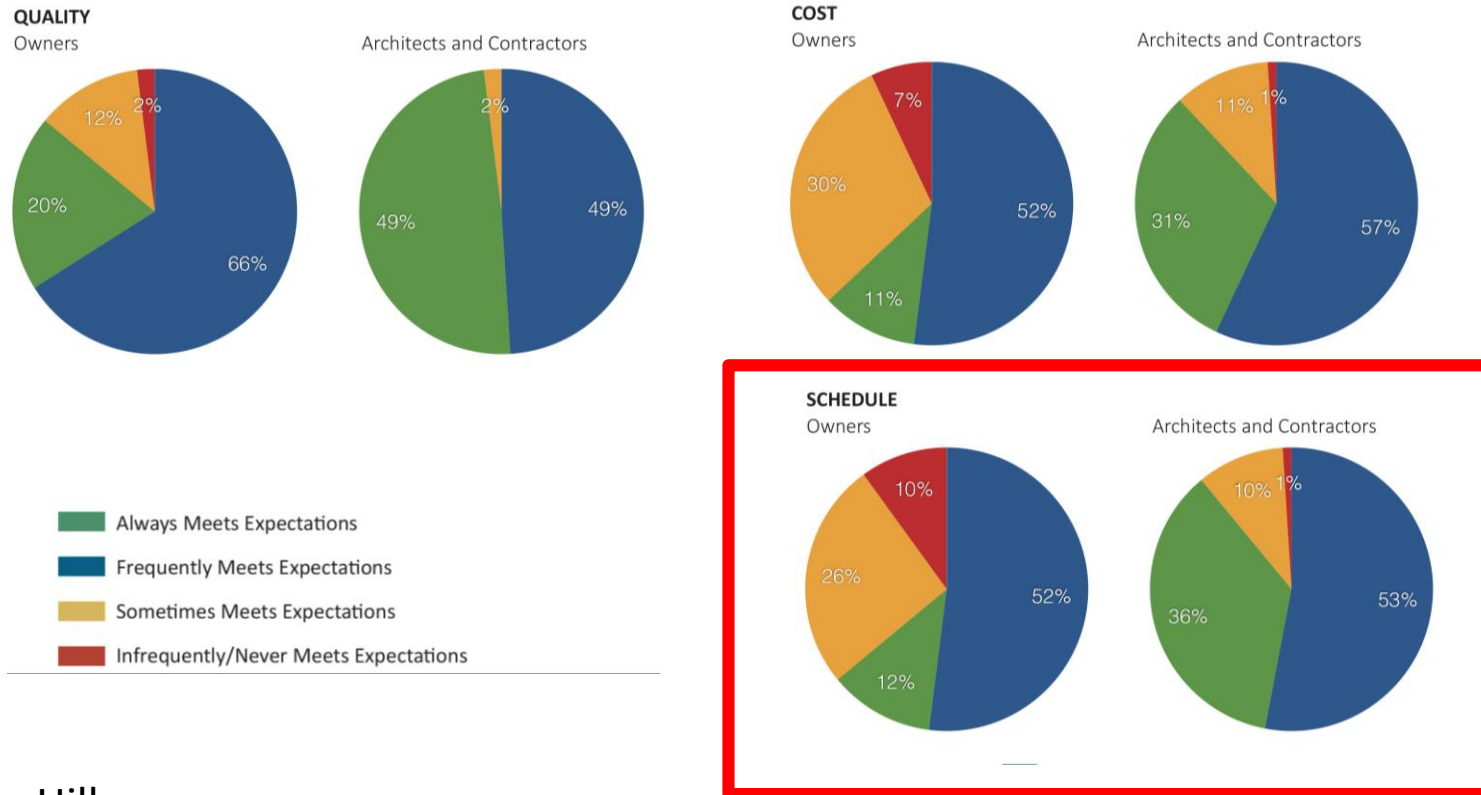


# Commitments

Projects are networks of commitments

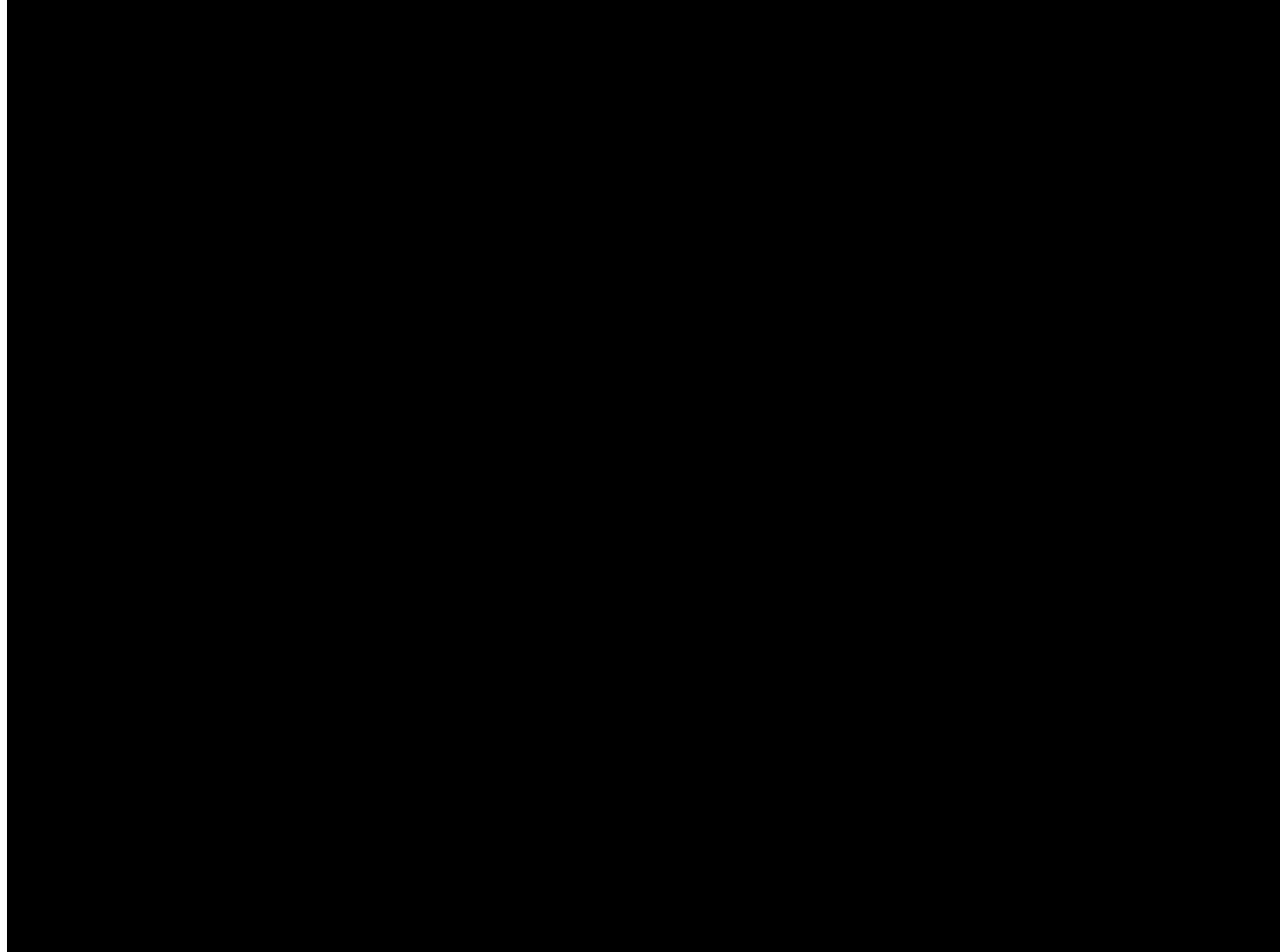


## Frequency with Which Projects Meet Expectations



**3x disconnect**

Source: McGraw-Hill  
SmartMarket Report (2014)





# Pull vs. Push

Google

Google Search

I'm Feeling Lucky



# Pull vs. Push



# Schedule Performance

- Research by Glenn Ballard and Greg Howell indicated only 54% of planned weekly activities get completed on average.
- Last Planner<sup>®</sup> pull system – a better way (typically 80-90% percent promises kept)



# Last Planner<sup>®</sup> System

## **Who are the Last Planners?**

The foremen and superintendents/site managers

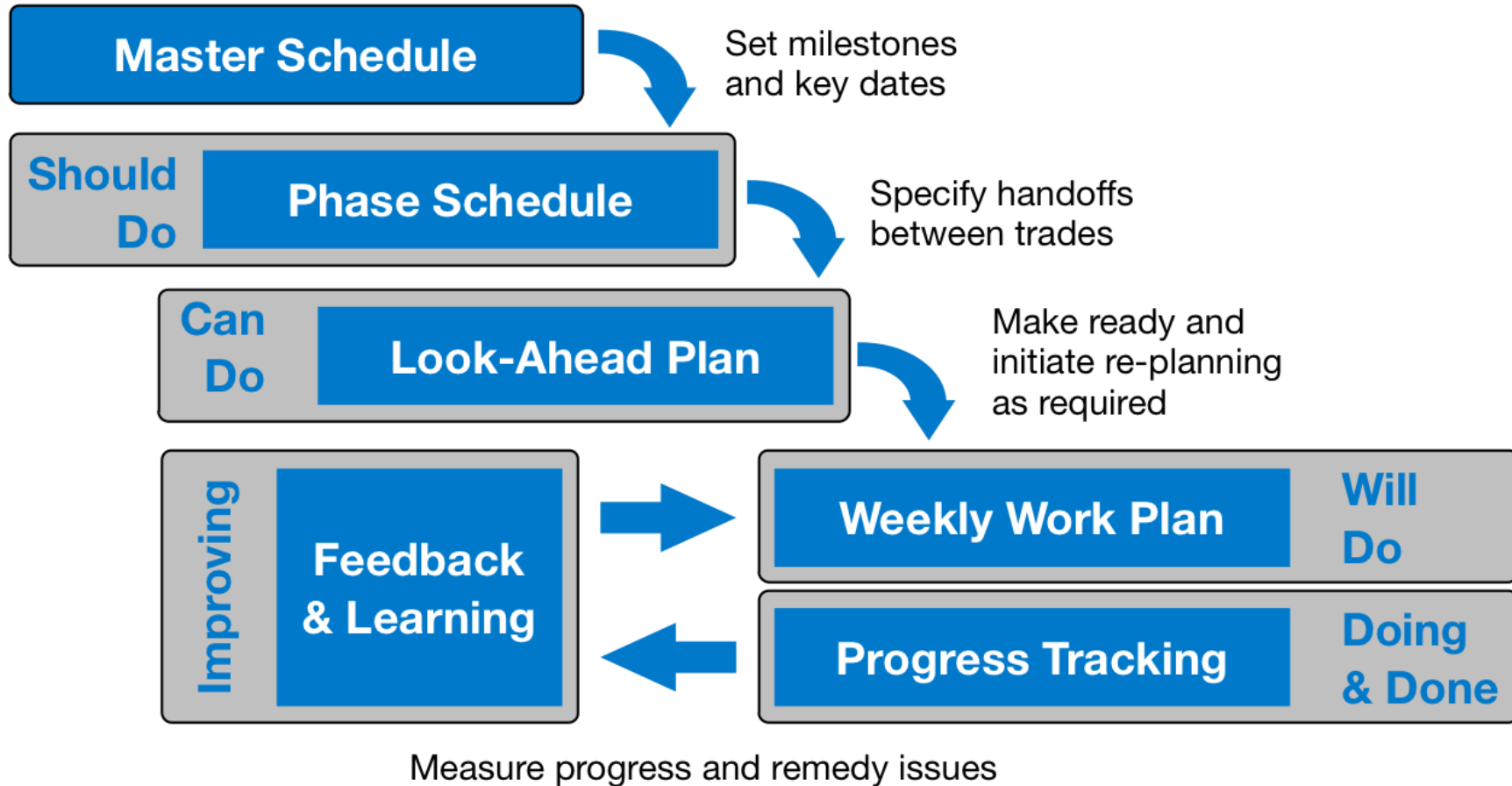
## **5 Major Elements of System**

- 1. Master Scheduling** – setting milestones
- 2. Phase (Pull) Planning** – specifying handoffs
- 3. Make Work Ready Planning** – 6 week look-ahead
- 4. Weekly Work Planning**
- 5. Learning** - Measure Percent Promises Complete, conduct root cause analysis and act on reasons for failure to keep promises

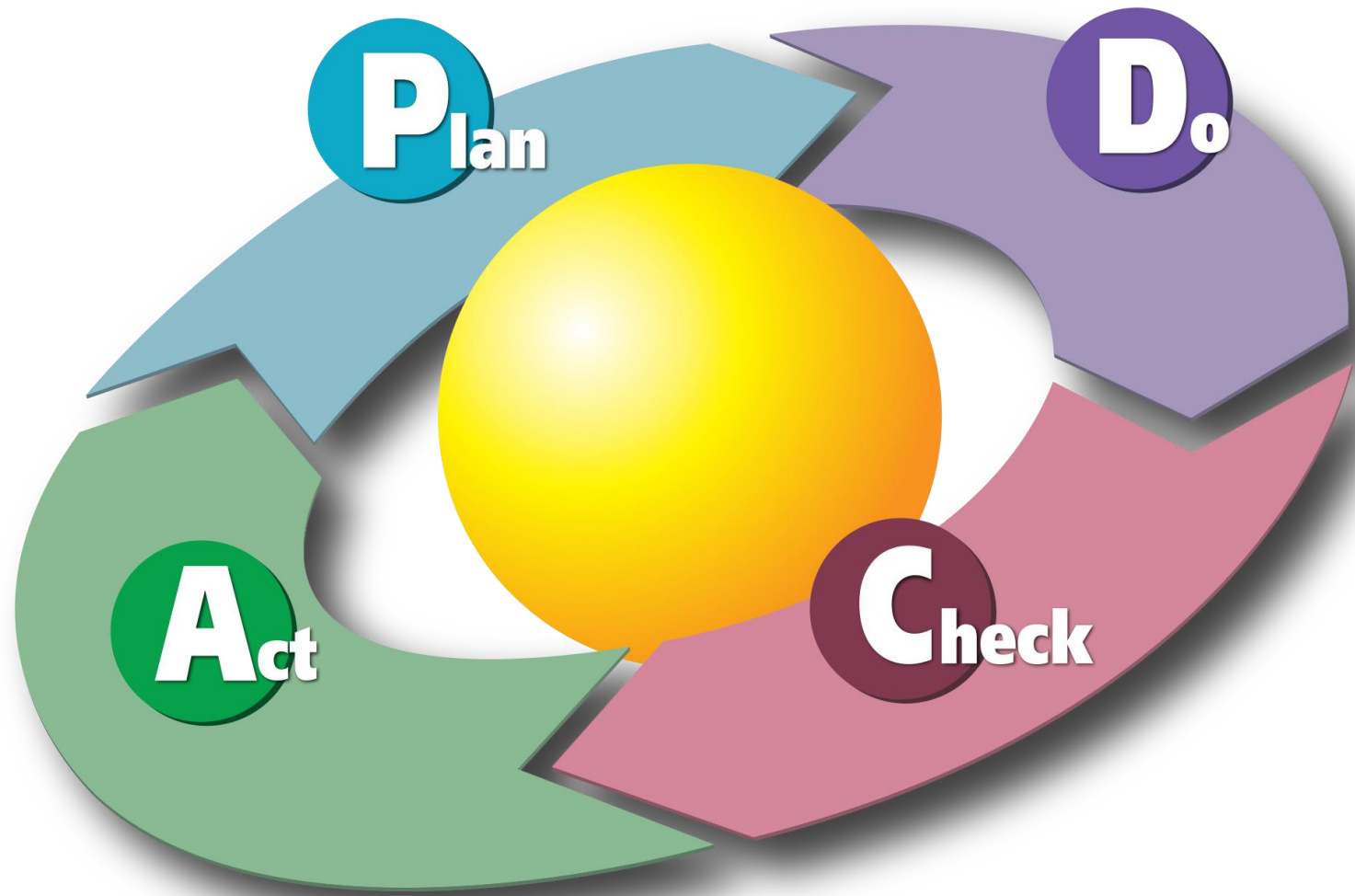
# Last Planner<sup>®</sup> System Principles

1. All plans are forecasts and all forecasts are wrong. The longer the forecast the more wrong it is. The more detailed the forecast, the more wrong it is.
2. Plan in greater detail as you get closer to doing the work.
3. Produce plans collaboratively with those who will do the work.
4. Reveal and remove constraints on planned tasks as a team.
5. Make reliable promises.
6. Learn from breakdowns.

# Last Planner System



Source: Adrian Smith (2011)



# Servant Leadership

*“What do you need from me to do your job?”*



	Location DH 1	Crew 5
Activity UNDERSLAB SERVICES  GL 21-25	I Give	
Predecessor / I Get STEEL	107	
Constraint		
Tag ID 389	Duration 5	

	Location DH 1	Crew 5
Activity UNDERSLAB SERVICES  GL 15-21	I Give	
Predecessor / I Get STEEL	107	
Constraint		
Tag ID 390	Duration 7	

# Milestone Planning



# Milestone Planning



# Pull Planning Activities



9/11/16

1st Floor

2nd Floor

3rd Floor

4th Floor

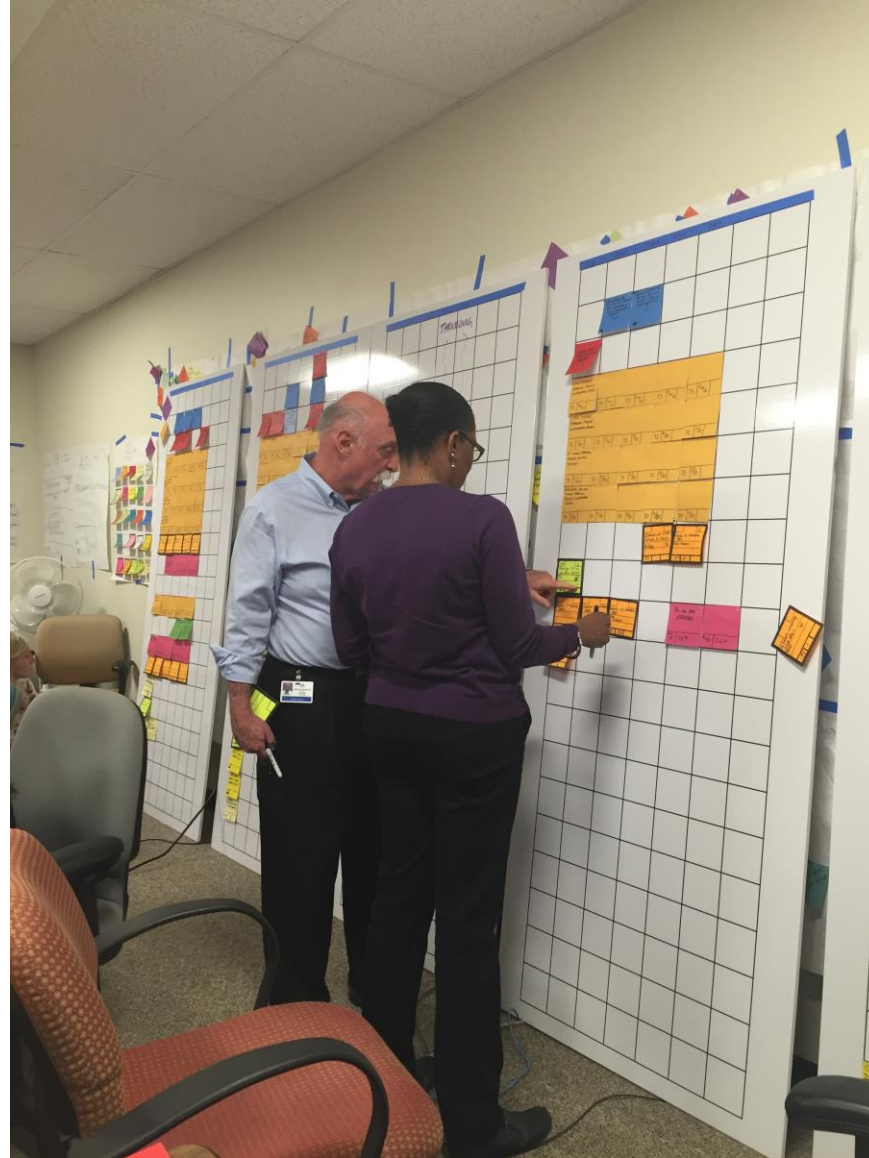
SUS ALL BAT RECHA NOTT

Site

Reasons Comm

- 1- Prerequisite Work
- 2- Design Issues
- 3- Workforce not
- 4- Materials not
- 5- Changes
- 6- No updates
- 7- I forgot
- 8- Unforeseen C
- 9- Bad Planning
- 10- Weather
- 11- Failed Inspect
- 12- Equipment no
- 13- Submittals/a

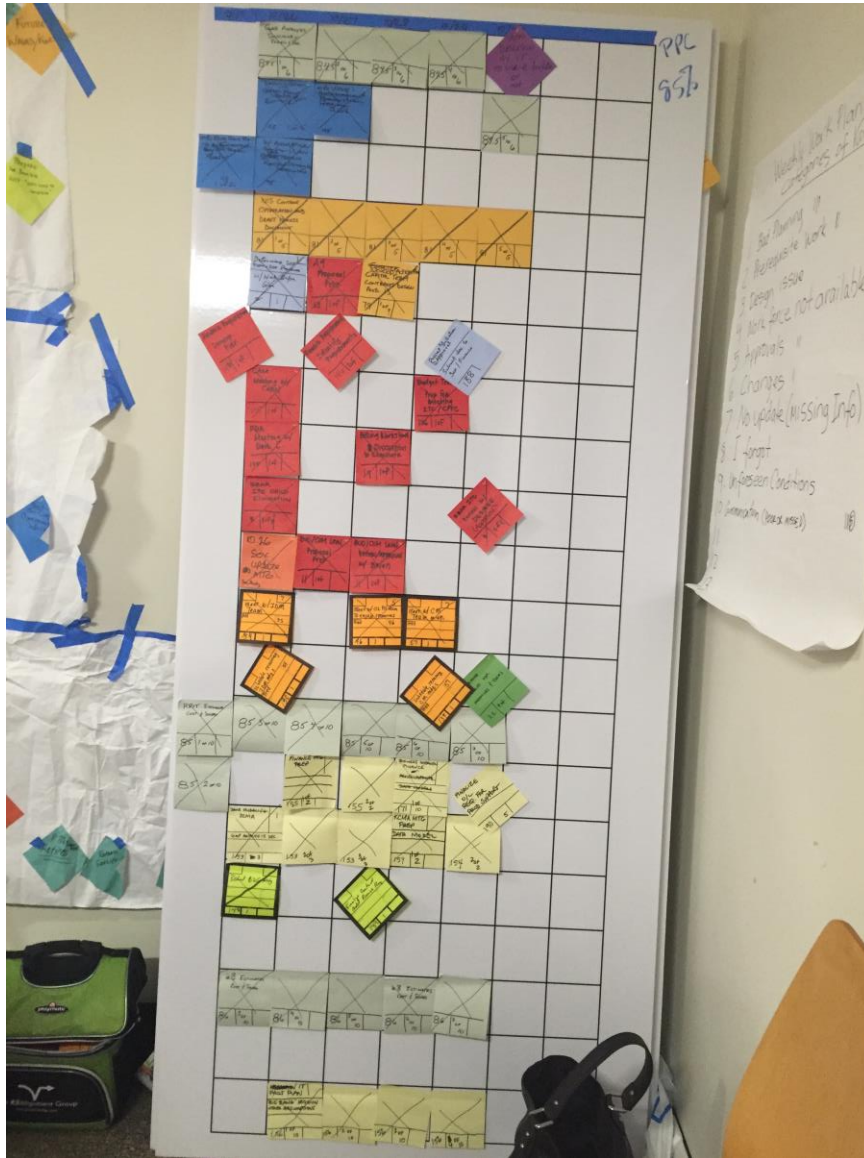
# 6-Week Make Work Ready Plan



# 6-Week Make Work Ready Plan



# Weekly Progress Meeting



- Weekly Work Plan  
Categories of Variance
1. Bad Planning 11
  2. Prerequisite work 11
  3. Design issue
  4. Work force not available 110
  5. Approvals 11
  6. Changes 1
  7. No update (Missing Info) 3
  8. I forgot
  9. Unforeseen Conditions
  10. Communication (POOR OR MISSED) 110



Project Wildcat













JUNE 17

JULY-17

FOUNDATIONS

DC 1 FLOOR SLAB START

ROOF START

DC 1	173
PROCURE	
IRON MATERIALS	
DC 1	173
TECH APPROVAL	

DC 1	198
PROCURE	
COP/BIM	
TECH APPROVAL	

DC 1	193
PROCURE	
FIXE MANN SYSTEM	
COP/BIM	
TECH APPROVAL	

DC 1	193
PROCURE	
COP/BIM	
TECH APPROVAL	

DC 1	191
PROCURE	
SLICE PIPES/VALV	
(PUMP, LIFTING, ETC)	
COP/BIM	
TECH APPROVAL	

DC 1	193
order Equip	
Tech sub stage 2	89
approval by client	41

DC 1	195
order Equip	
Tech sub stage 3	49
approval by client	49

DC 1	195
Columns/Maze/Roof	
Concrete + Anchors	45
Production/Design	45

DC 1	195
Columns/Maze/Roof	
Concrete + Anchors	45
Production/Design	45

DC 1	353
PROCURE	
LV CABLING	
COP/BIM	
TECH APPROVAL	

DC 1	42
Tech sub	
ISSUE	
STAGE 3	
Tech sub stage 2	42

DC 1	171
Elec Tech Sub Review	
F.H., Lighty	
Receive Tech Sub	171

DC 1	171
PROCURE	
WIRING +	
INSTALLING	
CABLES	
CONDUITS	
TECH APPROVAL	

DC 1	104
Columns/Maze/Roof	
Anchors	104
Foundation/Design	104

DC 1	106
Columns/Maze/Roof	
Concrete + Anchors	106
Production/Design	106

DC 1	107
Columns/Maze/Roof	
Concrete + Anchors	107
Production/Design	107

DC 1	108
Columns/Maze/Roof	
Concrete + Anchors	108
Production/Design	108

DC 1	353
LV Cable Edb Sub	
Review	
Receive Tech Sub	353

DC 1	29
Mech Tech Sub Review	
Stage 2	
Receive Tech Sub	29

DC 1	5
UNDERLIE SERVICE	
GL 21-25	
LOWER	
FILE PRODUCTIONS	

DC 1	43
EAS Plan	
Contract	43

DC 1	42
Mech Tech Sub Review	
Stage 3	
Receive Tech Sub	42

DC 1	103
Columns/Maze/Roof	
Concrete + Anchors	103
Production/Design	103

DC 1	105
Columns/Maze/Roof	
Concrete + Anchors	105
Production/Design	105

DC 1	106
Columns/Maze/Roof	
Concrete + Anchors	106
Production/Design	106

DC 1	107
Columns/Maze/Roof	
Concrete + Anchors	107
Production/Design	107

DC 1	108
Columns/Maze/Roof	
Concrete + Anchors	108
Production/Design	108

DC 1	109
AREA 3000/4000	
Workshop/initial	
DESIGN PASS	
Final Design	109

DC 1	9
AREA 3000/4000	
Workshop/initial	
PASS	
Final Design	9
after tender	10

DC 1	03
AREA 2000/4000	
Second PASS	
Final Design	03
after tender	04

DC 1	10
AREA 1000/2000	
Second PASS	
Final Design	10
after tender	11

DC 1	04
AREA 3000/4000	
Final DRAFT	
Final Design	04
after tender	05

DC 1	05
AREA 3000/4000	
Co-ordination	
Final Approval	
Final Design	05
after tender	07

DC 1	49
500	
ISSUE	
order stage 3	49
ORDERING COMPLETE	392

DC 1	109
500	
Stage 2	
Final Design	109
after tender	110

DC 1	109
AREA 3000/4000	
Workshop/initial	
DESIGN PASS	
Final Design	109

DC 1	4
INITIAL EARTH GRID	
Final Design	4
after tender	5

DC 1	139
Review BMS Design	
Final Design	139
after tender	140

SUBM	450
ABB 500 STATUS	
ISSUE DATE	
APP DESIGN INT SAT	

DC 1	10
ALL EARTH	
Final Design	10
after tender	11

DC 1	11
AREA 1000/2000	
Final DRAFT	
Final Design	11
after tender	12

DC 1	12
AREA 1000/2000	
Co-ordination	
Final Approval	
Final Design	12
after tender	13

SUBM	199
MV L2/L3	
CHECK LIST ISSUE	

SUBM	199
LV L2/L3	
CHECK LIST ISSUE	

SUBM	199
BMS 500'S	
ISSUED	
BMS DESIGN APPROVAL	199



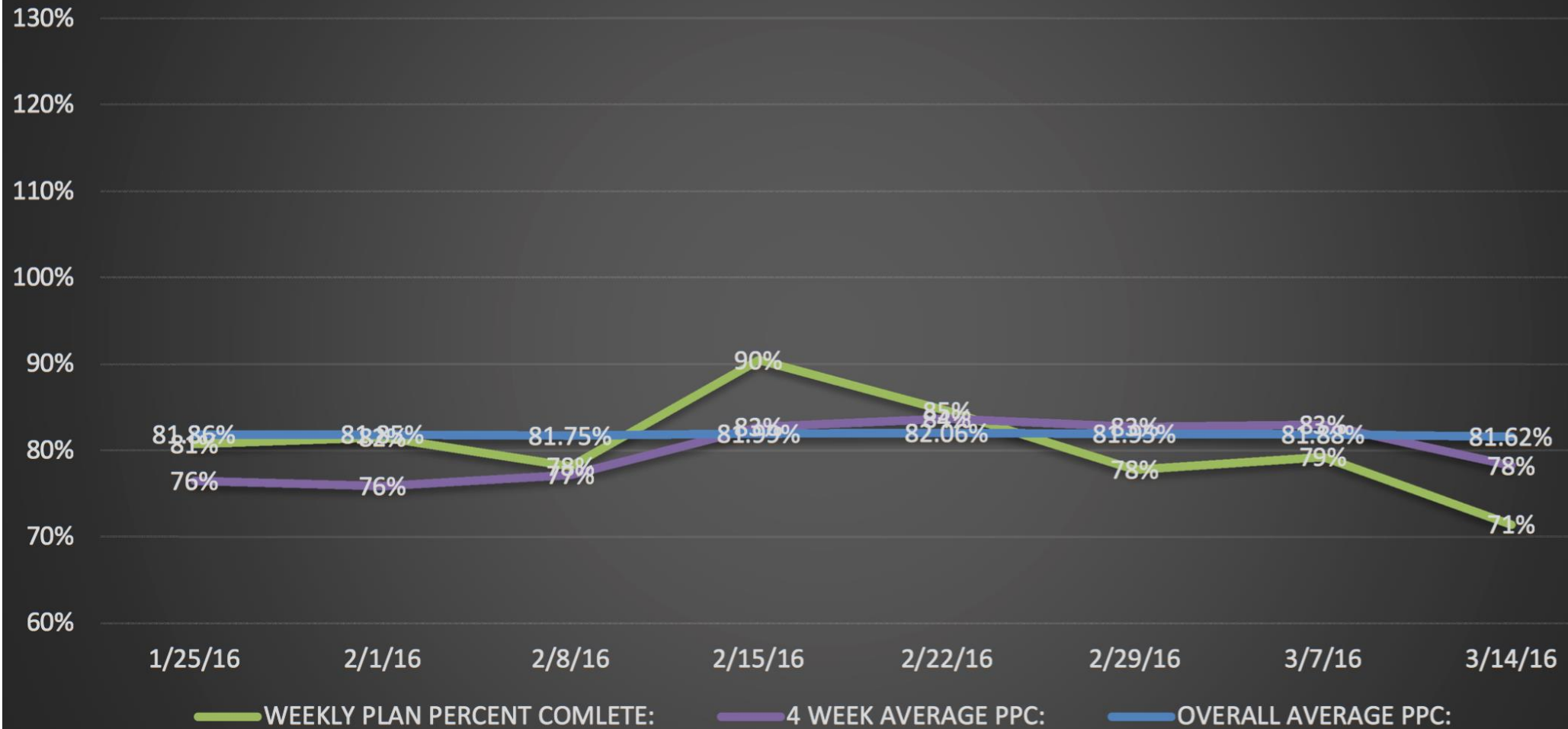




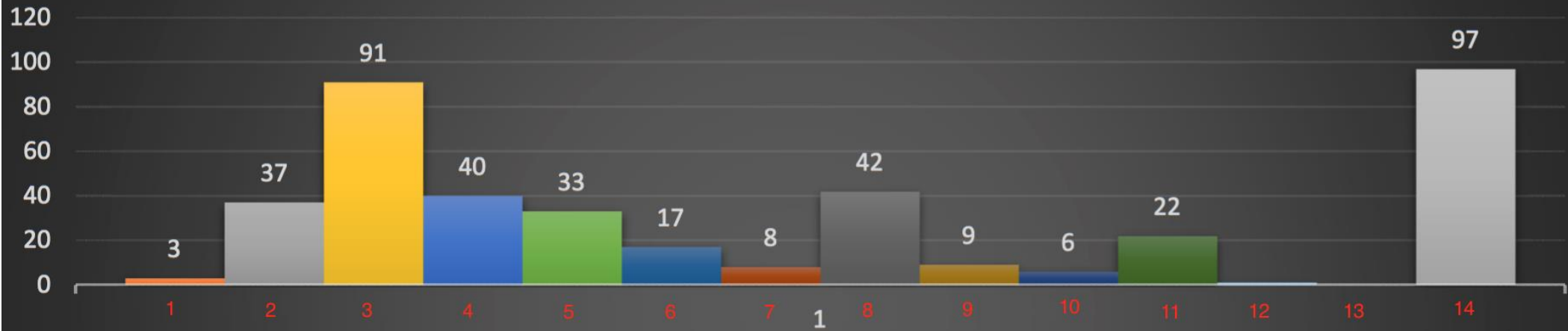




# Plan % Complete



# Variance Log



1 WEATHER

3 MANPOWER DEFICIENCY

5 SUBMITTALS NO APPROVED

7 OWNER CHANGE / REQUEST

9 EQUIPMENT OR TOOL ISSUES

11 UNFORESEEN CONDITION

13 UNPLANNED WORK

2 PREDECESSOR NOT COMPLETE

4 PROCUREMENT

6 UNCLEAR INFORMATION / DEFICIENT DETAILS

8 ACCESS TO WORK AREA

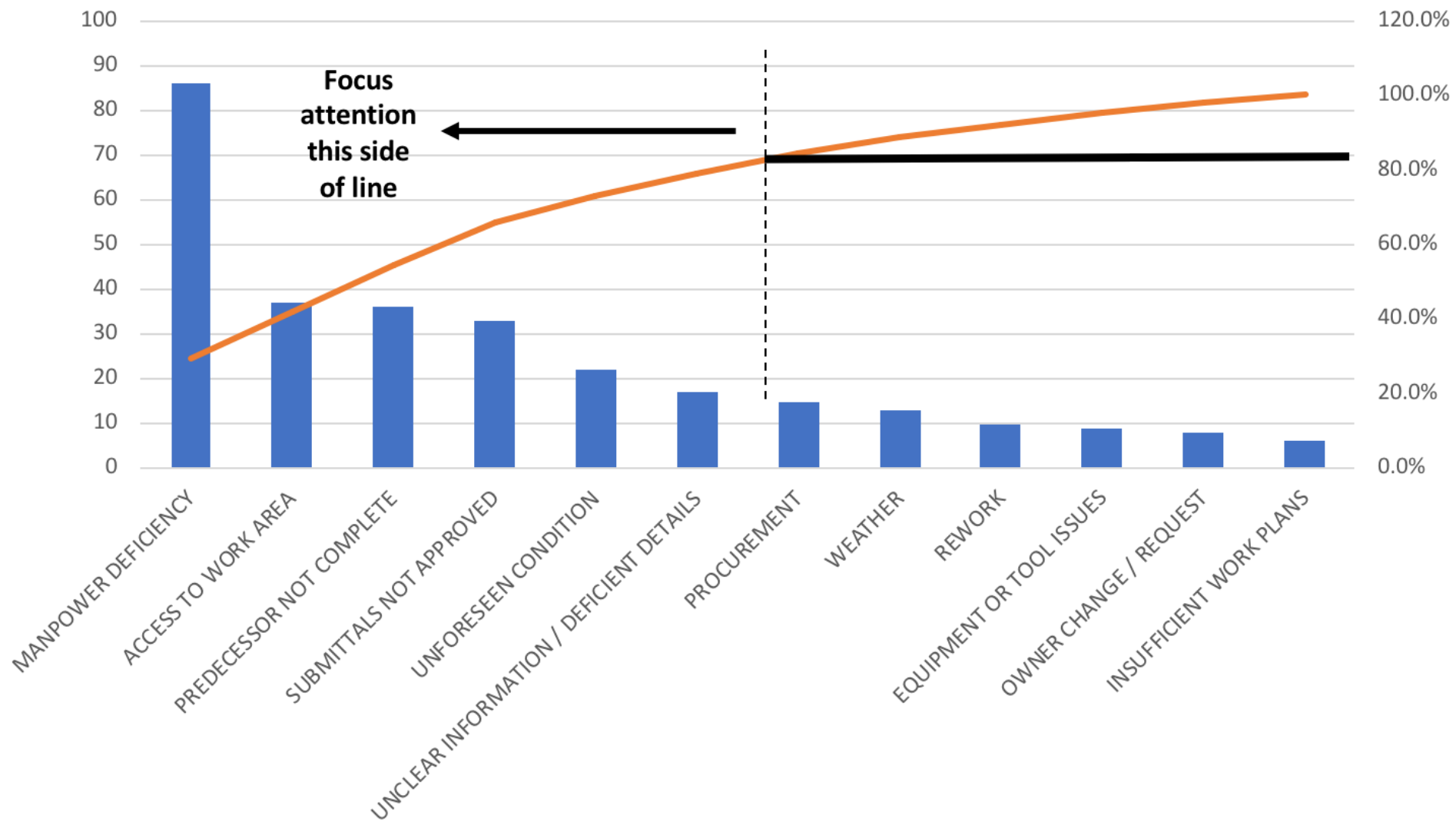
10 INSUFFICIENT WORK PLANS

12 REWORK

14 DEFERRED NON-CRITICAL PATH WORK

# Sample Variance Analysis - Missed Commitments

## Pareto Chart



# Your Lean Coaching Consultants

*“Helping Deliver Better Projects, Performance and Results”*

## The Last Planner® System in Action



Umstot Project and Facilities Solutions, LLC



The ReAlignment Group of **California**, LLC

<https://www.youtube.com/watch?v=i4VAyKjMMYg>





# Questions?

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