25TH ANNUAL

25TH LCI CONGRESS
OCTOBER 24-27, 2023

Introduction to Last Planner System® in Design

Neelanjana Sen – HGA Architects and Engineers

Justin Wise – Stantec

25 YEARS OF LEARNING: SUPERCHARGE YOUR LEAN JOURNEY IN THE MOTOR CITY

10/24/23

Introductions


Justin Wise

Justin is a Healthcare Principal at Stantec with a focus on integrated project delivery (IPD) and a dedication to Lean principles.

Neelanjana Sen

Neelanjana is an Associate Vice President with HGA Architects, and a Champion of all principles of Lean

Facilitation Slide

Facilitator:	Neelanjana Sen + Justin Wise		10/24/2023	Time keeper:	Justin Wise
Meeting Start Time:	8:00 AM	CDT		**Meeting End Time:**	12:00 PM

Time (PST)	Duration	End Time	Topic	Leader	Who	Notes/Decisions/Action Items
8:00 a	5 min	8:05 AM	Preamble	NS/JW		1. Speaker Introductions 2. Rules of Engagement 3. Plus/Delta
8:05 a	25 min	8:30 AM	Milestone Lecture/Discussion	NS/JW	ALL	1. Group Discussion (10 min)
8:30 a	35 min	9:05 AM	Group Activity #1	ALL	ALL	1. Milestone Planning (20 min) 2. Report Out (15 min)
9:05 a	10 min	9:15 AM	BREAK	ALL	ALL	
9:15 a	35 min	9:50 AM	Phase Pull Planning Lecture/Discussion	NS/JW	ALL	
9:50 a	90 min	11:20 AM	Group Activity #2	ALL	ALL	1. Phase Pull Planning (65 min) Use SCRUM to solve issue and discuss promises 2. Report Out (25 min)
11:20 a	20 min	11:40 AM	Conclusion Lecture/Discussion	NS/JW	ALL	1. Weekly Work Planning 2. Learning/PPC/PRCO/Comittments 3. Root Cause 4. Reflection 5. Capturing Lessons Learned 6. How to Implement Group Discussion (10 min)
11:40 a	20 min	12:00 PM	Next Steps/Adjournment plus/delta	NS/JW	ALL	

Rules of Engagement


1

Phones/Devices OFF
during the meeting
-
check at break

2

One meeting
-
NO side bar discussions

3

Listen
-
Engage the material
-
Keep an open mind

4

No “rank”
in the room
-
we are equal peers

5

Help team
stay on task

6

Return from breaks /
be in your chair
on time

7

Safe zone
-
ask questions
-
no fear

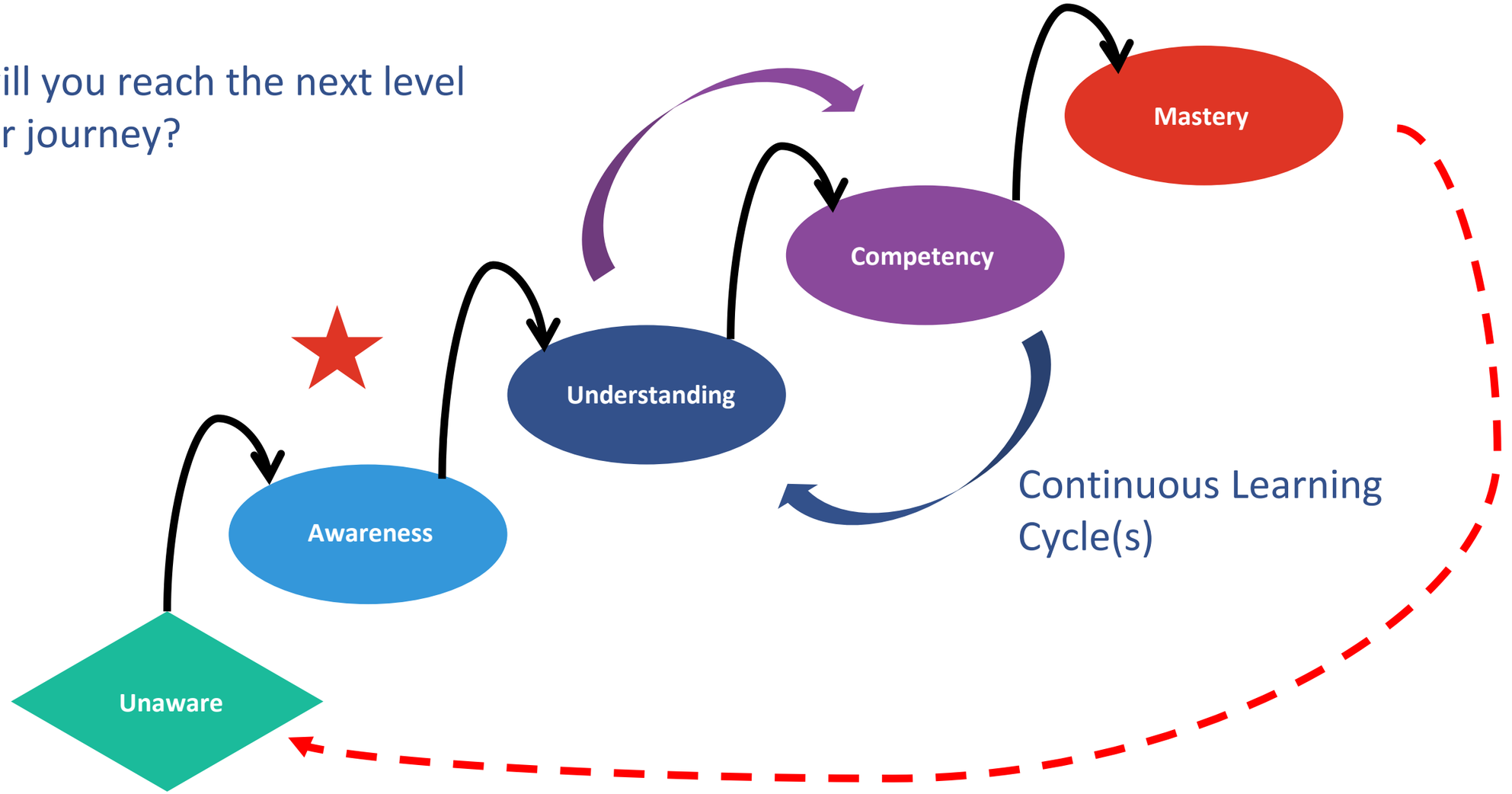
PlusDelta

+	△
Plus: *What produced value during the session*	**Delta:** *What could we change to improve the process or outcome?*

https://plusdelta.app/join/CSUK6K

Lean Journey to Mastery

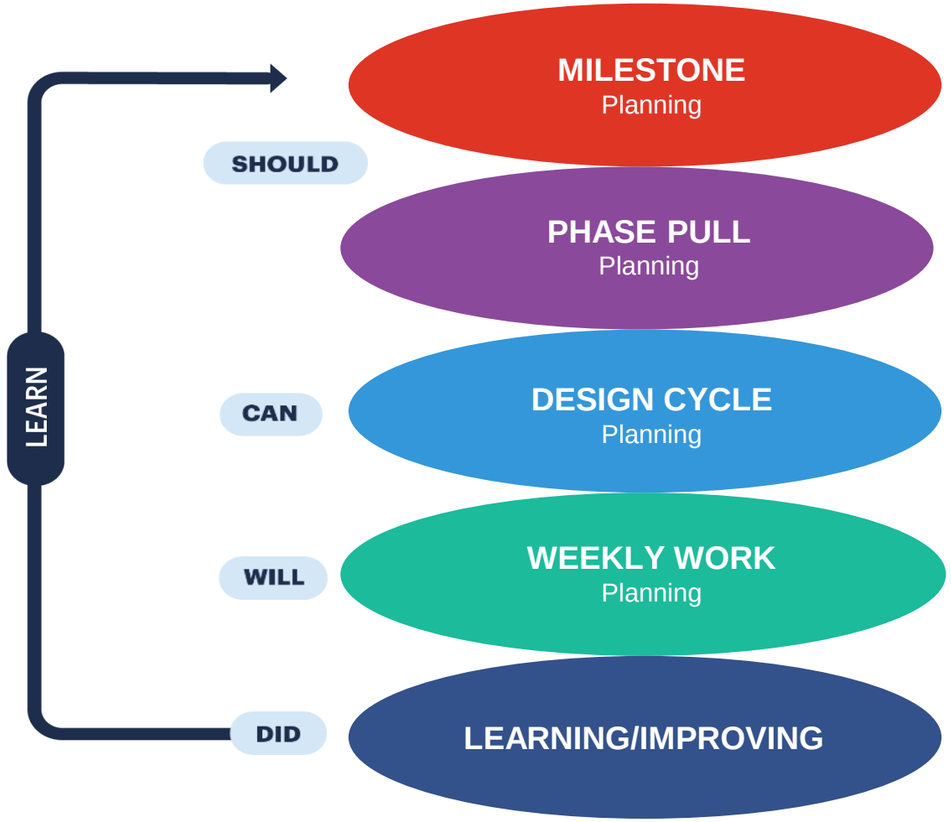
How will you reach the next level on your journey?



Learning Overview

1. Why Last Planner System®
2. LPS® Overview
3. Milestone Planning
4. Phase Pull Planning
5. Design Cycle Planning
6. Weekly Work Planning
7. Learning/Improving

5 Connected Conversations



The Last Planner System® (LPS®) is a registered trademark of the Lean Construction Institute.

Group Discussion

What is your understanding of the difference between Ideation and Production Design Activities?

Group Discussion 5 mins; Report out 5 mins

Why LPS® In Design?

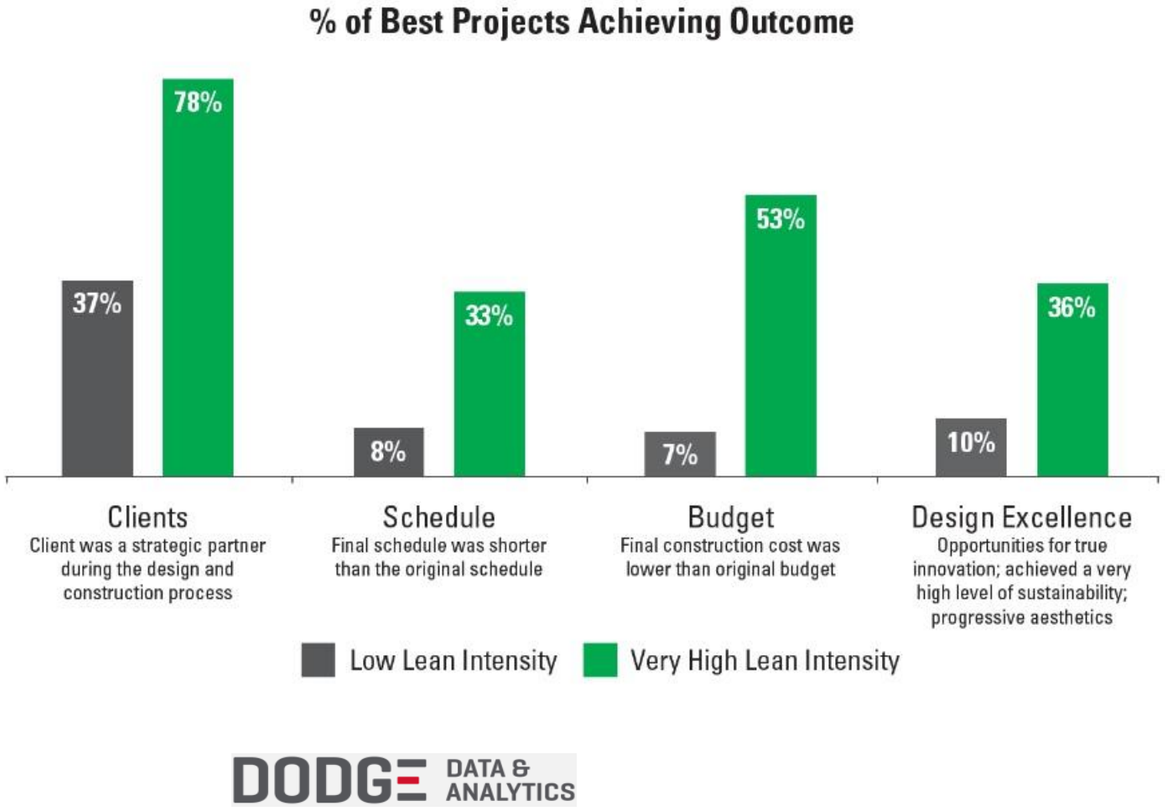
Experienced Lean practitioners implementing LPS in design state that it aids in:

- **Information** Sharing
- Identifying key **Decision** points.
- Alignment with **C**onditions **O**f **S**atisfaction
- Team Alignment for **Project Delivery**

Why Implement LPS®?

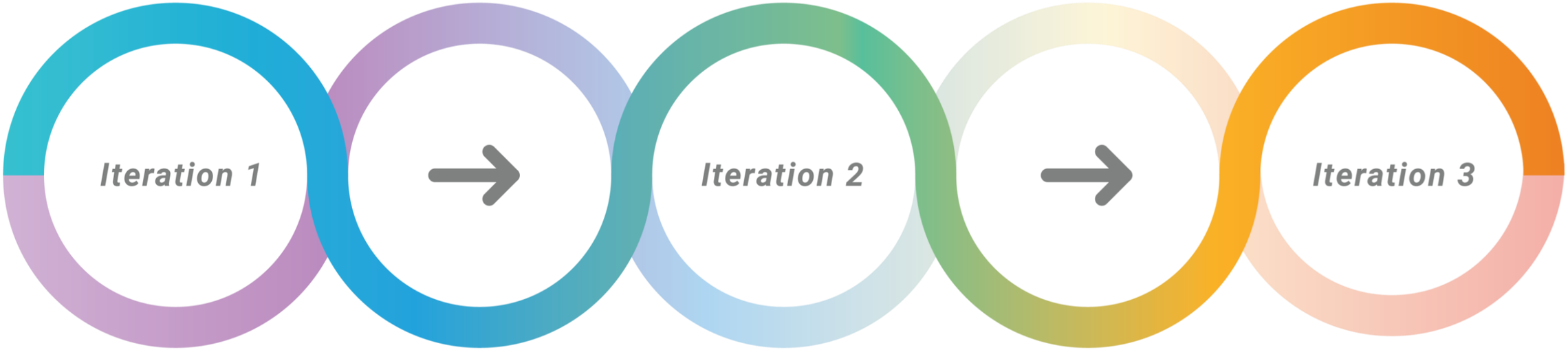
Dodge benchmarked “best” and “typical” projects from 310 designers. Each project was completed in 2012 or later with construction costs of at least $10M.

Findings: statistically significant correlation between very high Lean intensity projects and likelihood for better client outcomes and design excellence.



LPS® In Design

Iterative Process Flow



Iteration 1	Iteration 2	Iteration 3
Creative Process	Creative Process	Refine Document Decision
Planning and CoS	Planning and CoS	
Set Based Design	Set Based Design	
Testing/Target Costing	Testing/Target Costing	
Evaluation + Reflection	Evaluation + Reflection	

Courtesy: Stantec Architecture

Design Considerations

While the Last Planner System® is used in construction, it is highly applicable and useful in design. Some key differences to keep in mind include:

Design:

- Is emerging based on new information and the flow is “information”
- Milestones are clearly defined by expected outcome which should describe what needs to be known
- Milestones are often “decision points”

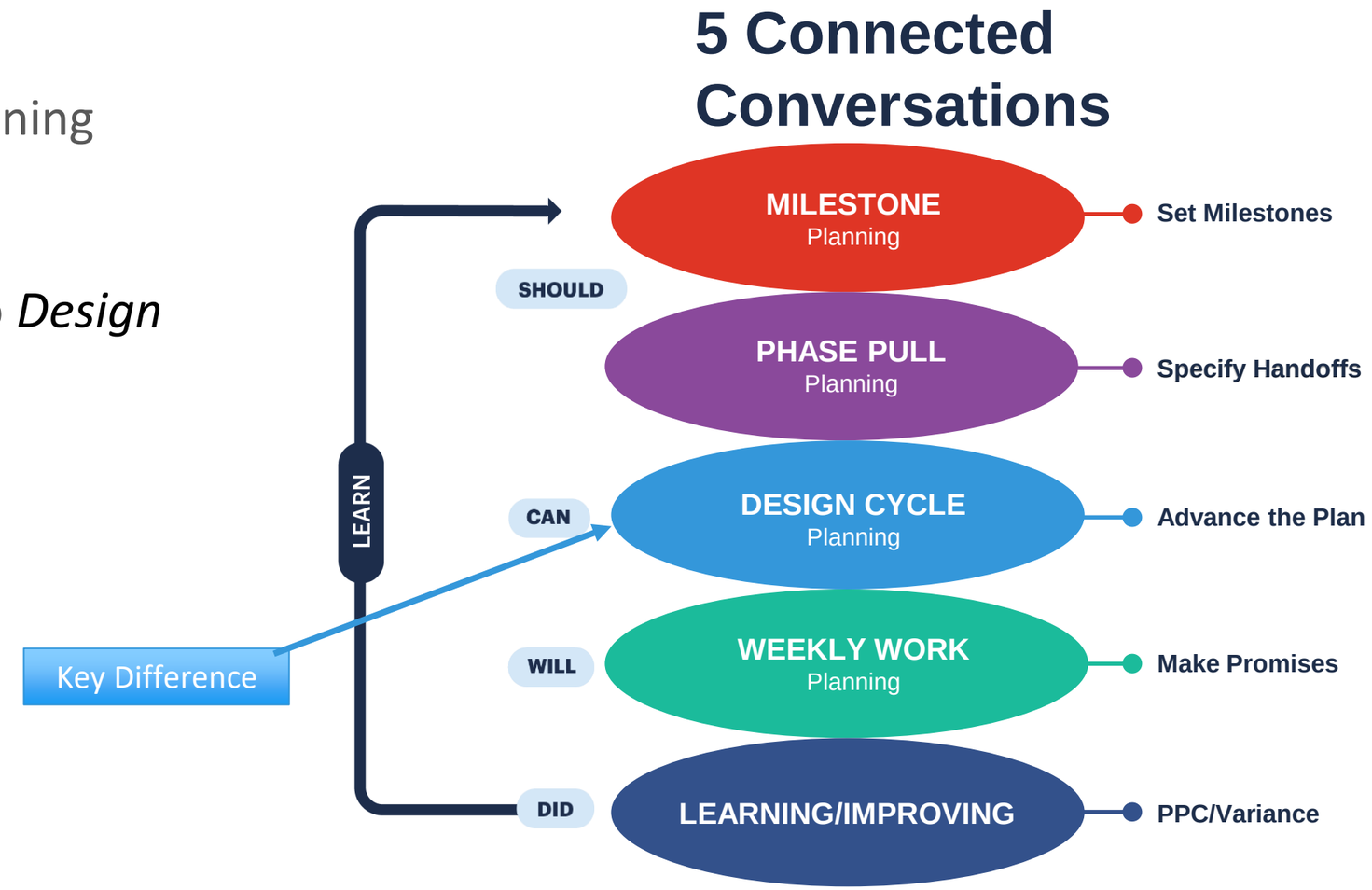
Construction:

- Is linear in nature and the flow is “tangible materials”
- Milestones are clearly defined by expected outcome which will be observable in the field

Design Cycle Planning

In modifying LPS for design, the 5 planning conversations remain the same.

The *Lookahead Planning* level shifts to *Design Cycle Planning*.



Who Is The Last Planner

The *Last Planner*® (LP™) is the person closest to work with authority to make decisions regarding the schedule and to make reliable commitments to complete the work of their discipline.

This may include the lead architect or project manager, the lead engineer, owner's project representative and the constructors as appropriate.

Courtesy: Stantec Architecture

Understanding Push VS. Pull

Push:

- Advancing work based on central schedule.
- Releasing materials, information, or directives possibly according to a plan, but irrespective of whether or not the downstream process is ready to process them.

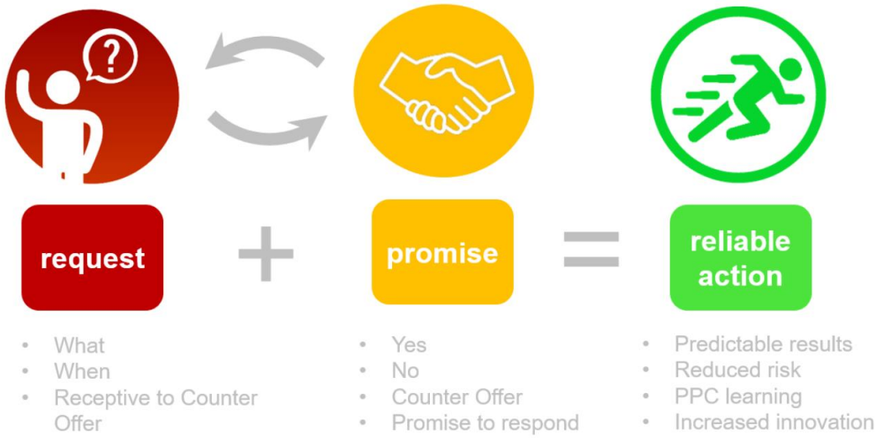
Pull:

- A method of advancing work when the next in line customer is ready to use it. A “Request” from the customer signals that the work is needed and is “pulled” from the performer.
- Pull releases work when the system is ready to use it.

Elements of a Promise

Elements of a promise include:

- The Customer
- The Performer
- Negotiated Conditions Of Satisfaction (CoS)



Basic Action Workflow Of A Promise

PREPARATION

1 Customer prepares to make a request of the Performer.

2 Customer makes a request of the Performer.

NEGOTIATION

3 Customer & Performer negotiate the CoS.

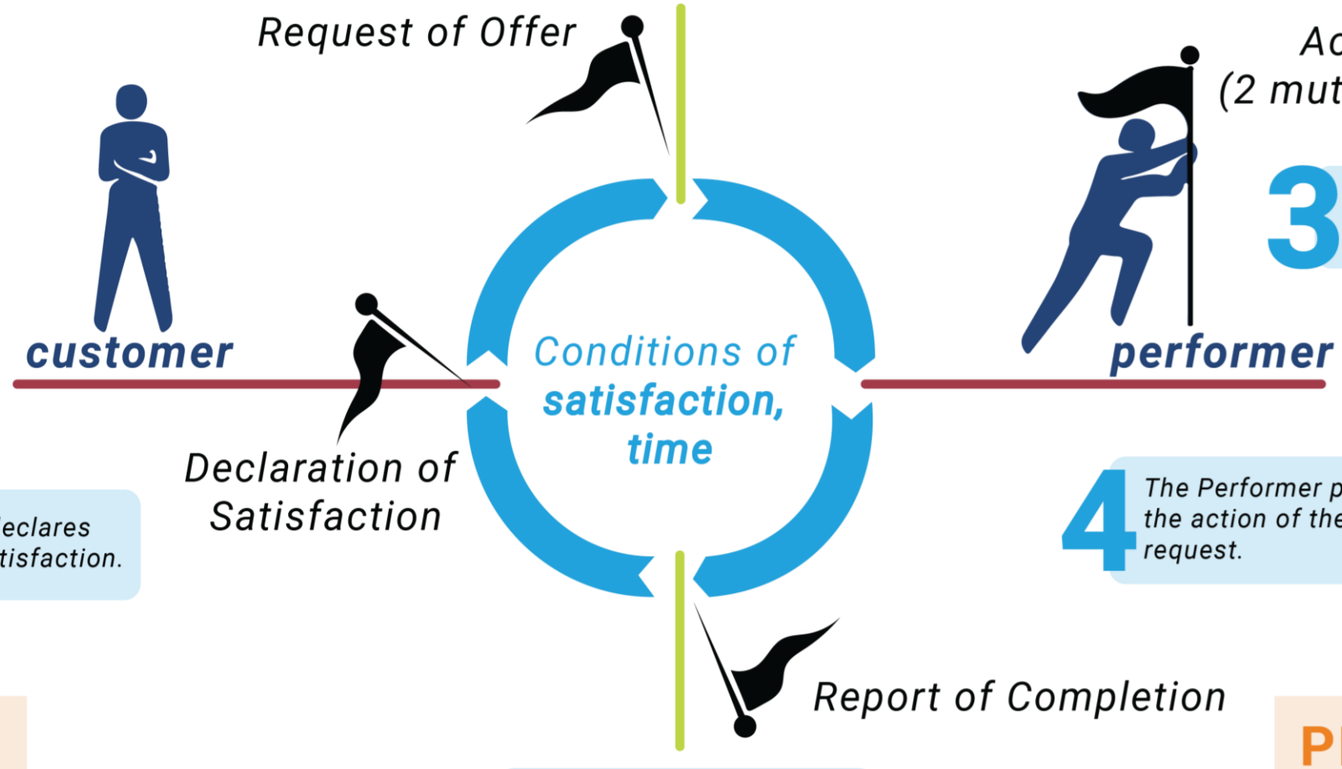
4 The Performer performs the action of the negotiated request.

PERFORMANCE

5 The Performer declares the request complete.

ACCEPTANCE

6 The Customer declares (or declines) satisfaction.



Credit: Dr. Fernando Flores

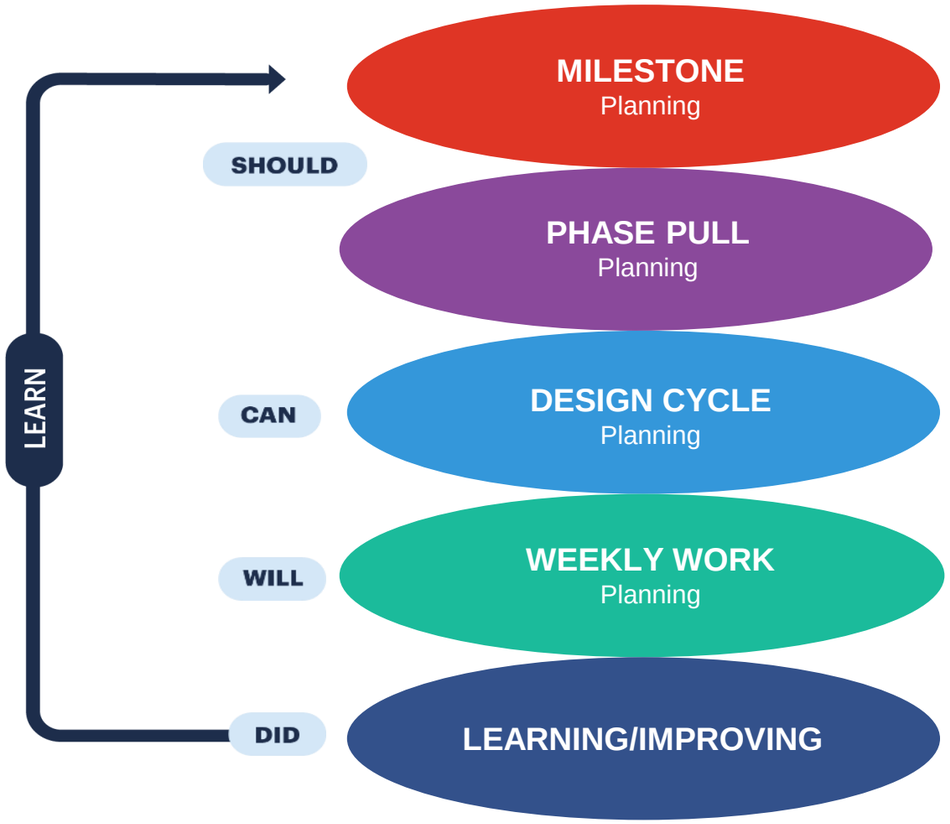
Milestone Planning

The first level of LPS is ***Milestone Planning***.

The goal of Milestone Planning is for the team to align on and *set the milestones* for the project.

The conversation at this level starts the *"should"* be able to do conversation.

5 Connected Conversations



Milestone Definition

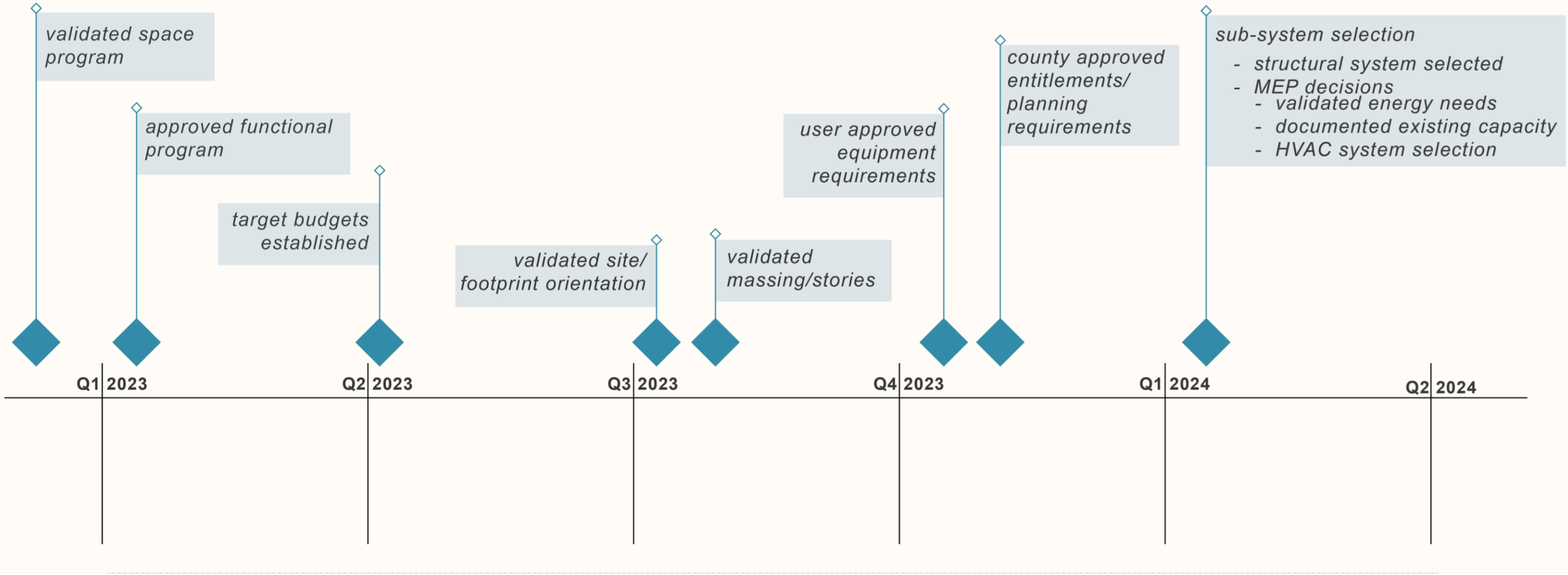
Traditional

- Deliverable Drawing Sets
- Submit, Review, Price Iteration
- Percent Complete Sets
  - 30/60/90

Re-Defined

- Information Hand Offs
- Decision Points as Milestones
- Design first then draw
- Submission (permit) sets as backlog

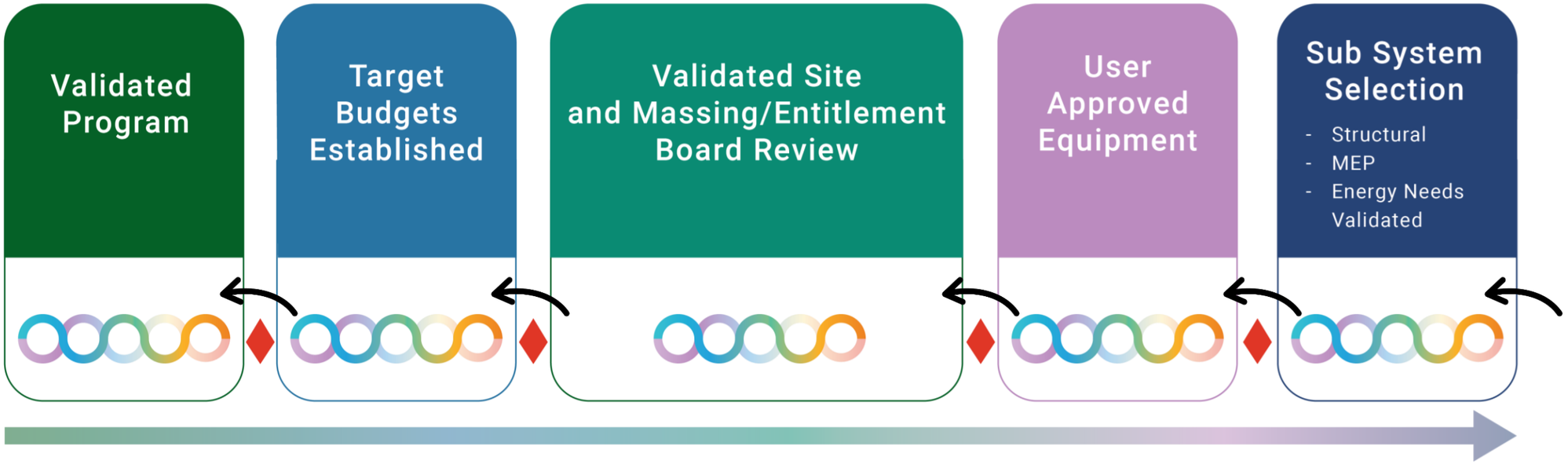
Decision Based Milestones

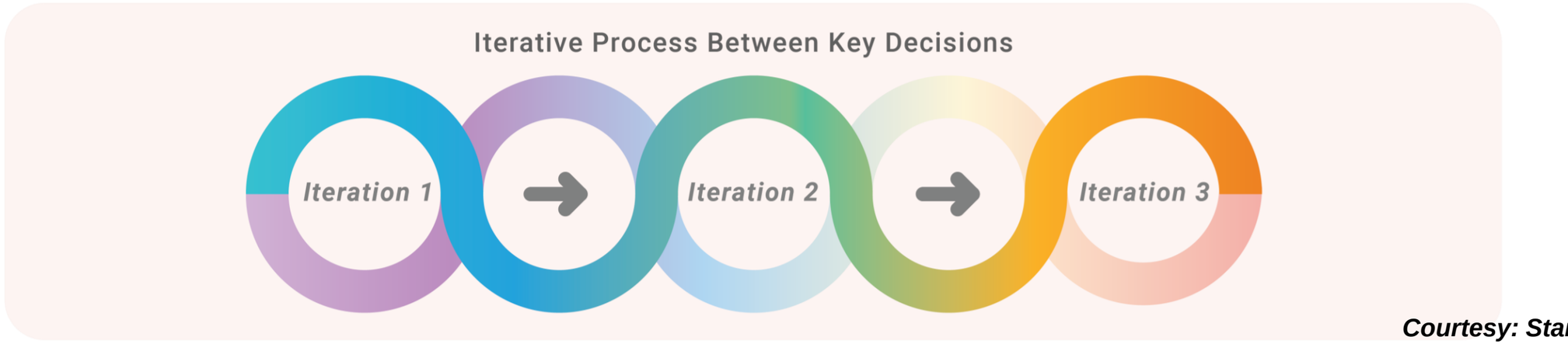


- *CBA to select Paramount Advantage for systems, design elements, etc.*
- *A3 to Capture Key Decisions*

Courtesy: Stantec Architecture

Optimizing Value





Courtesy: Stantec Architecture

Creating The Milestone Plan

- Developing the milestones to structure the flow.

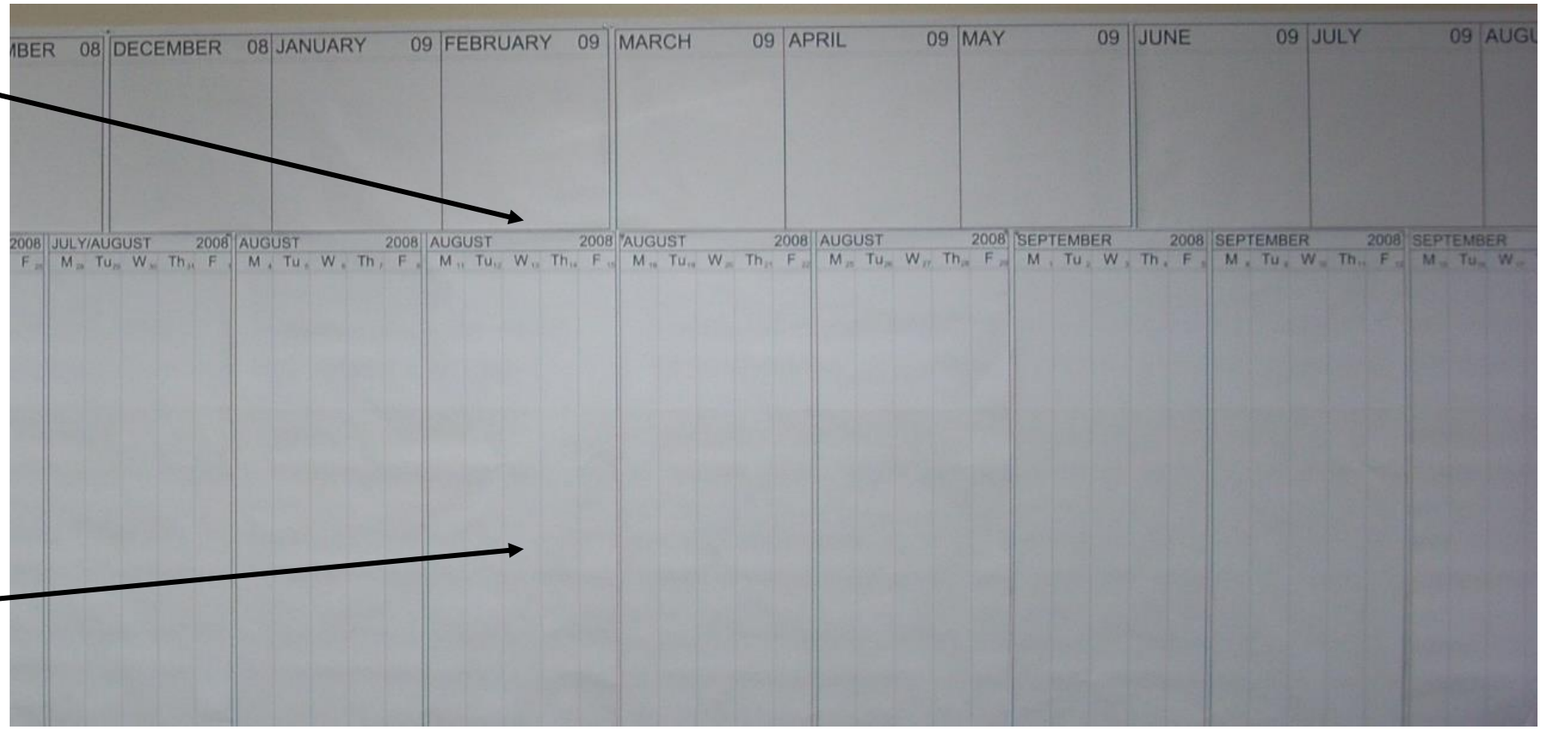
  The next step is to add estimated durations.

Courtesy: Stantec Architecture

Setting Up To Plan

This set up includes a time scale (months) to transfer the Milestone Plan to once dates are determined.

This set up includes a time scale (weeks & days) for the next level Phase Pull Planning.



CoS

Specific	S
Measureable	M
Attainable	A
Relevant	R
Time-Based	T

Example Conditions of Satisfaction:

EXAMPLE

Project Conditions OF Satisfaction

1. Quality meeting or exceeds standard
2. Total project budget at or below the team agreed upon total project cost at the end of validation (includes all hard and soft costs, plus escalation and contingency)
3. Expeditious Schedule
4. Minimal Disruption
5. Timely Decision Making
6. Operationally Efficient
7. Integration of all Care Services
8. Does not exceed conditional use permit limitations meets all EIR requirements
9. Considers operational changes to address capacity demands

Courtesy: Stantec Architecture

Let’s Plan a Wedding!

“Motor City” Wedding

Marshall and Diana are planning a wedding in **6 months in Detroit** and they have hired the LCI 101 team to help plan their wedding.

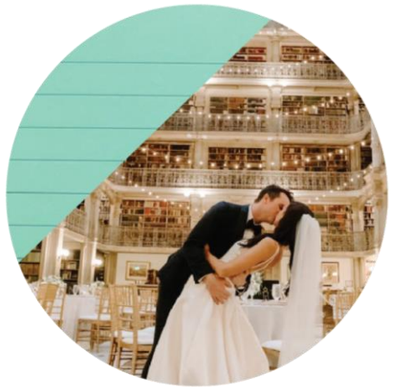
Milestones – Conditions of Satisfaction

COS

- Plan for weather
- Detroit themed
- On-Budget (budget $40,000.00)
- On-Time (planning to include photography, ceremony, reception, dinner and dancing)

Break Up In Groups – Identify Milestones

Group 1 Catering and Photography



Group 2 Invitations and Decorating

Report Out

Explain the logic

Large Group Discussion 15 min

Break

10 Min.

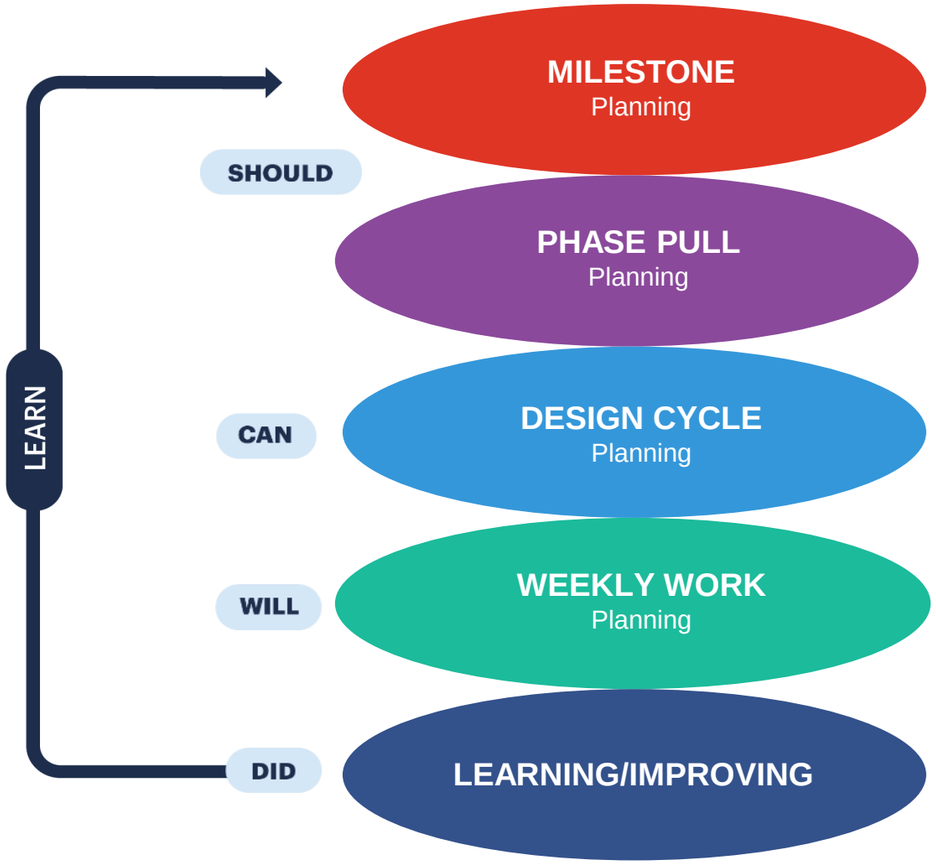
Phase Pull Planning

The second level of LPS is *Phase Pull Planning.*

The goal of Phase Pull Planning is for the team to determine the key *handoffs* of work or information needed to deliver a milestone.

The conversation at this level continues the *"should"* be able to do conversation.

5 Connected Conversations

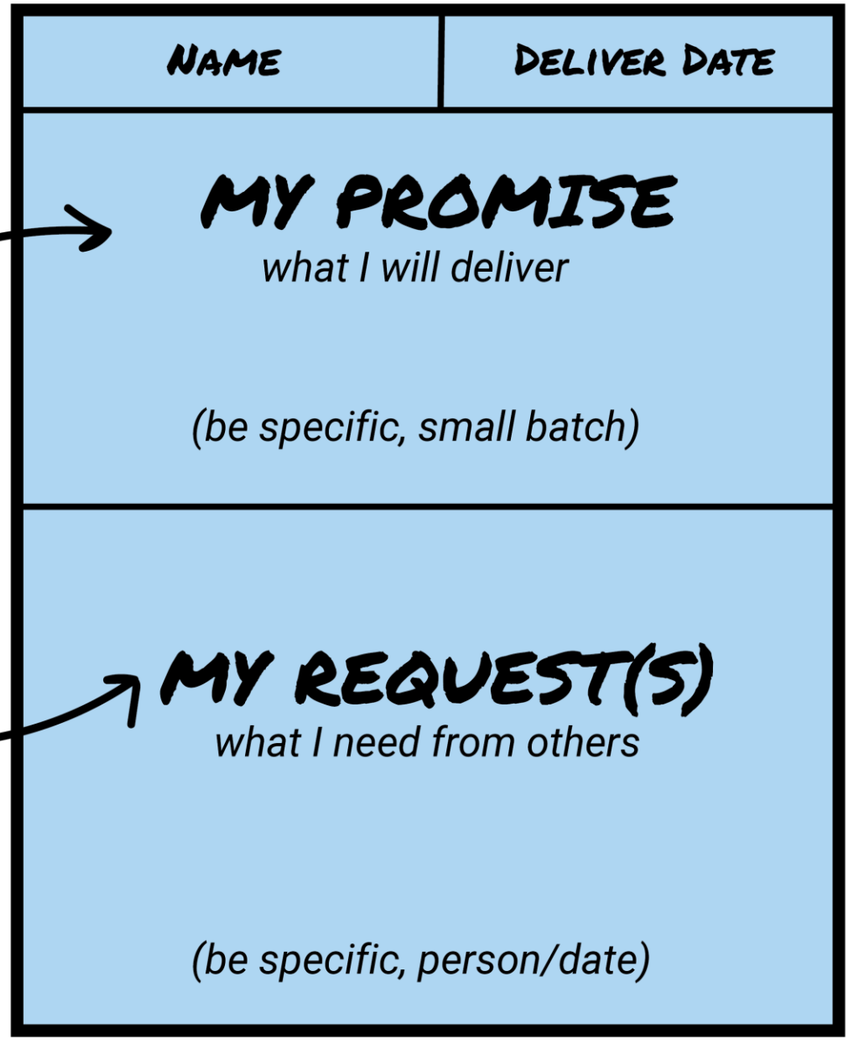


Focus on Hand-Offs

Creating Tags For Promises

1 *The* **Performer** *completes a tag to capture their* **Promise** *for work or information to be delivered to meet the* **Request** *of the downstream* **Customer**

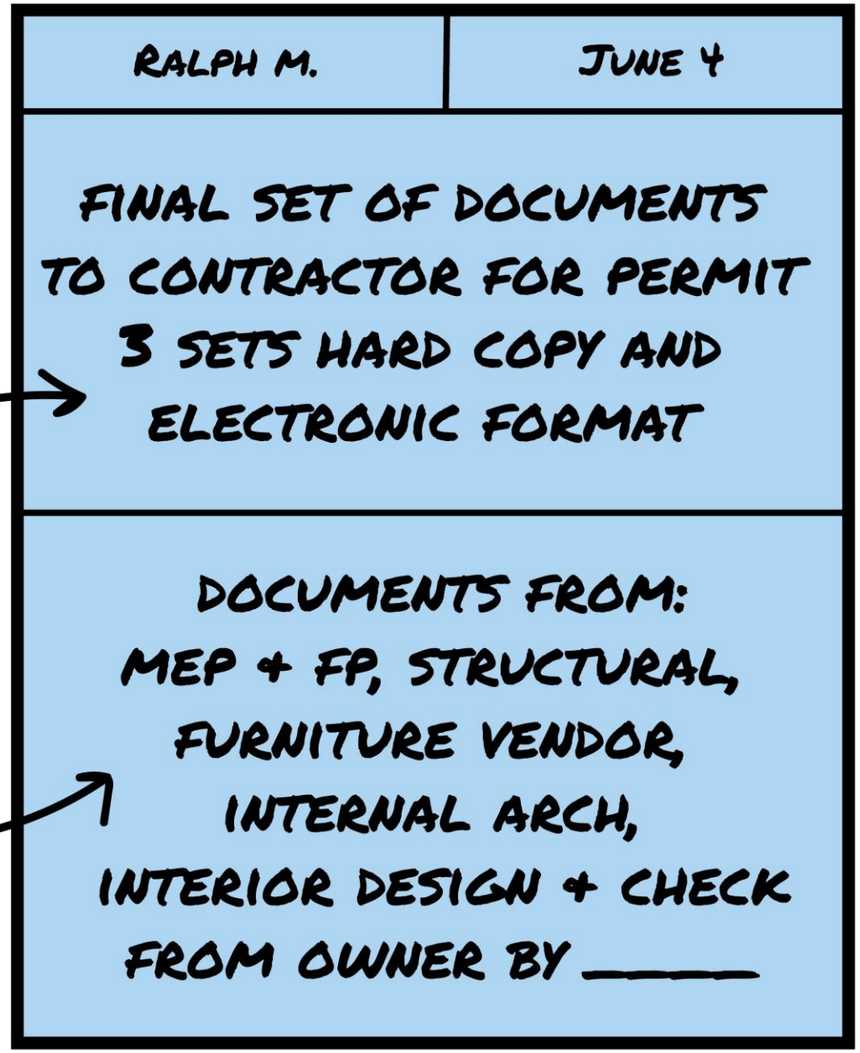
2 *The* **Performer** *then makes a* **Request(s)** *for work or information needed from an upstream* **Performer** *in order to complete their* **Promise**



Creating Tags For Promises

1 *The* **Performer's Promise** *for work or information they deliver.*

2 *The* **Performer's Request** *for work or information needed to complete their* **Promise.**



Creating The Phase Pull Plan

Color-coded milestones on the Phase Pull Plan

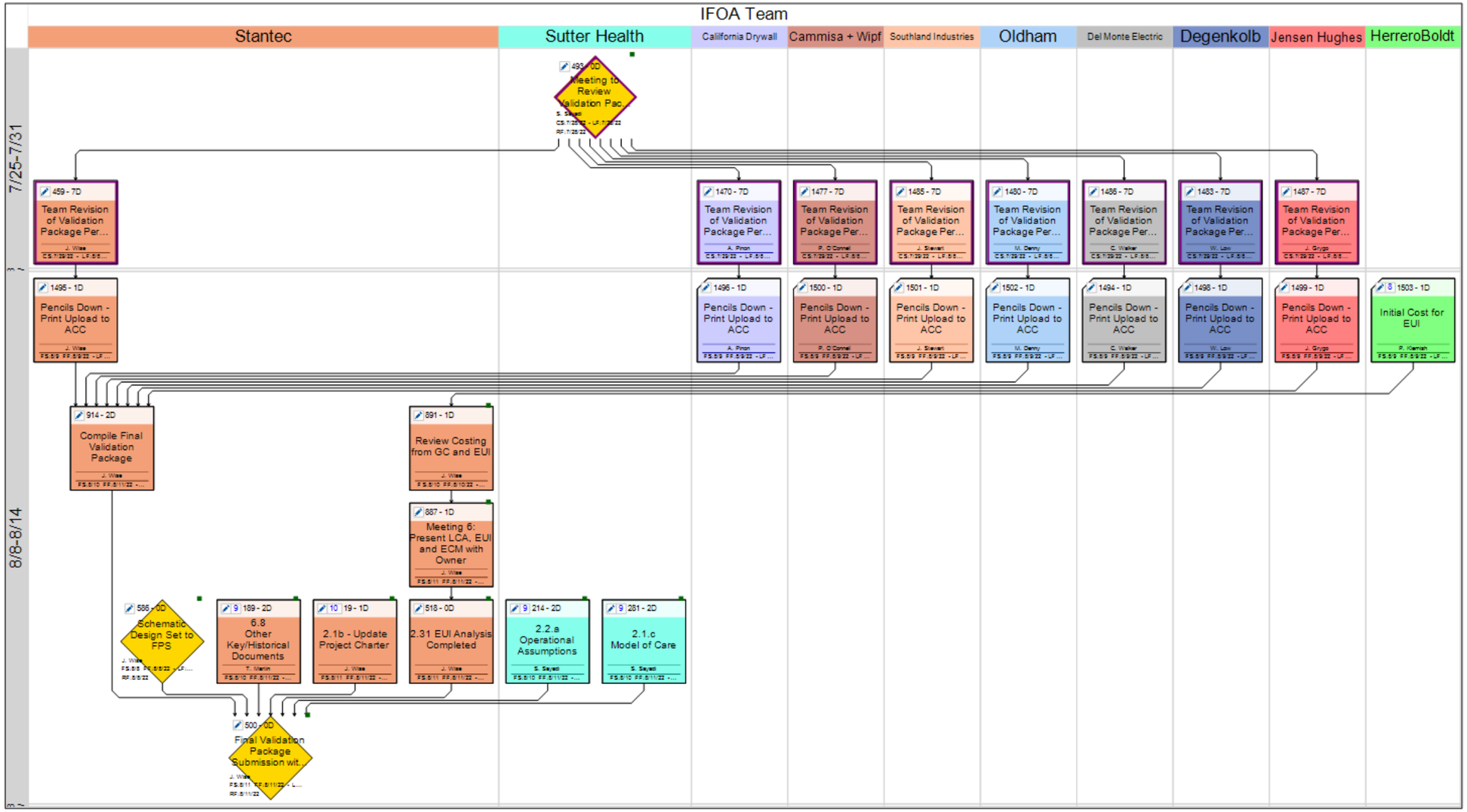
Pull to date of handoff needed

Involve key discipline leads

Future milestone remain on the Milestone Plan

Courtesy: UHS Temecula Valley Hospital Team

Swim Lane Example



Pull Planning In Action

Note the three-tag pull example from this planning session.

Pull Planning In Action

3

JOE T.	SEPT 7
PROVIDE LIGHT FIXTURE CUT SHEETS AND PLANS	
NOTHING NEEDED	

2

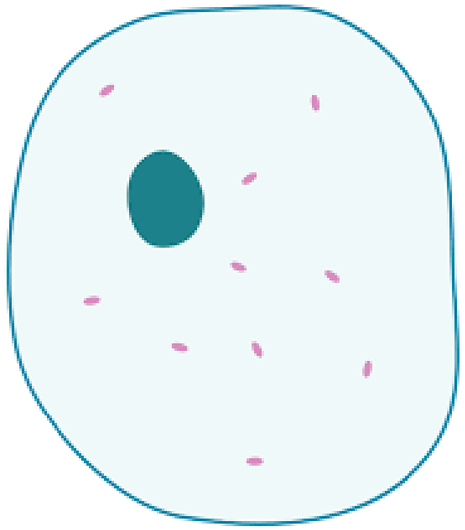
STACEY	SEPT 14
LIGHTING LAYOUTS, INCLUDING ERGRESS PATHS W/ EXIT LIGHTING	
LIGHT FIXTURE CUTS SHEET FROM JOE	

1

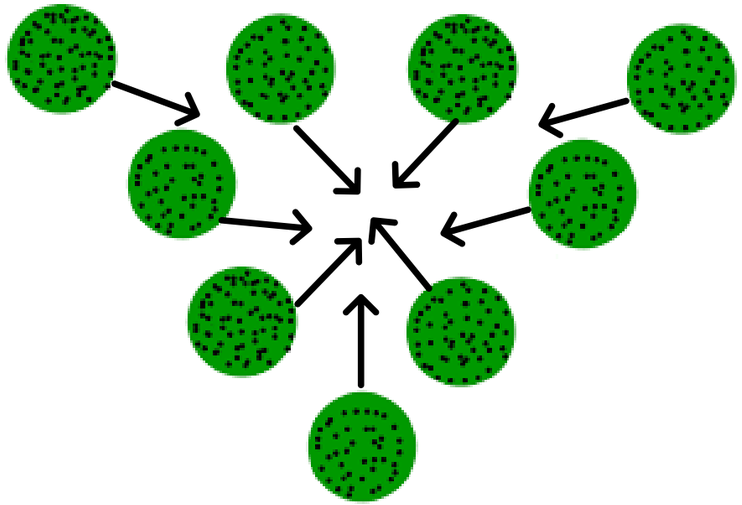
JOE T.	SEPT 7
FINALIZE LIGHTING LOADS + CIRCUITING	
FINAL LIGHTING LAYOUTS EQUIPMENT CUTS... APPROVALS FROM STACEY	

Pull Planning Options

Team vs. Cluster Pull Plans



VS.



Team Pull Planning

Cluster Pull Planning

Team Style Pull Planning

- Pre-Covid, large group exercise
- In-person, at a white board
- Each discipline quickly describes design flow
- Start with the architect's flow first

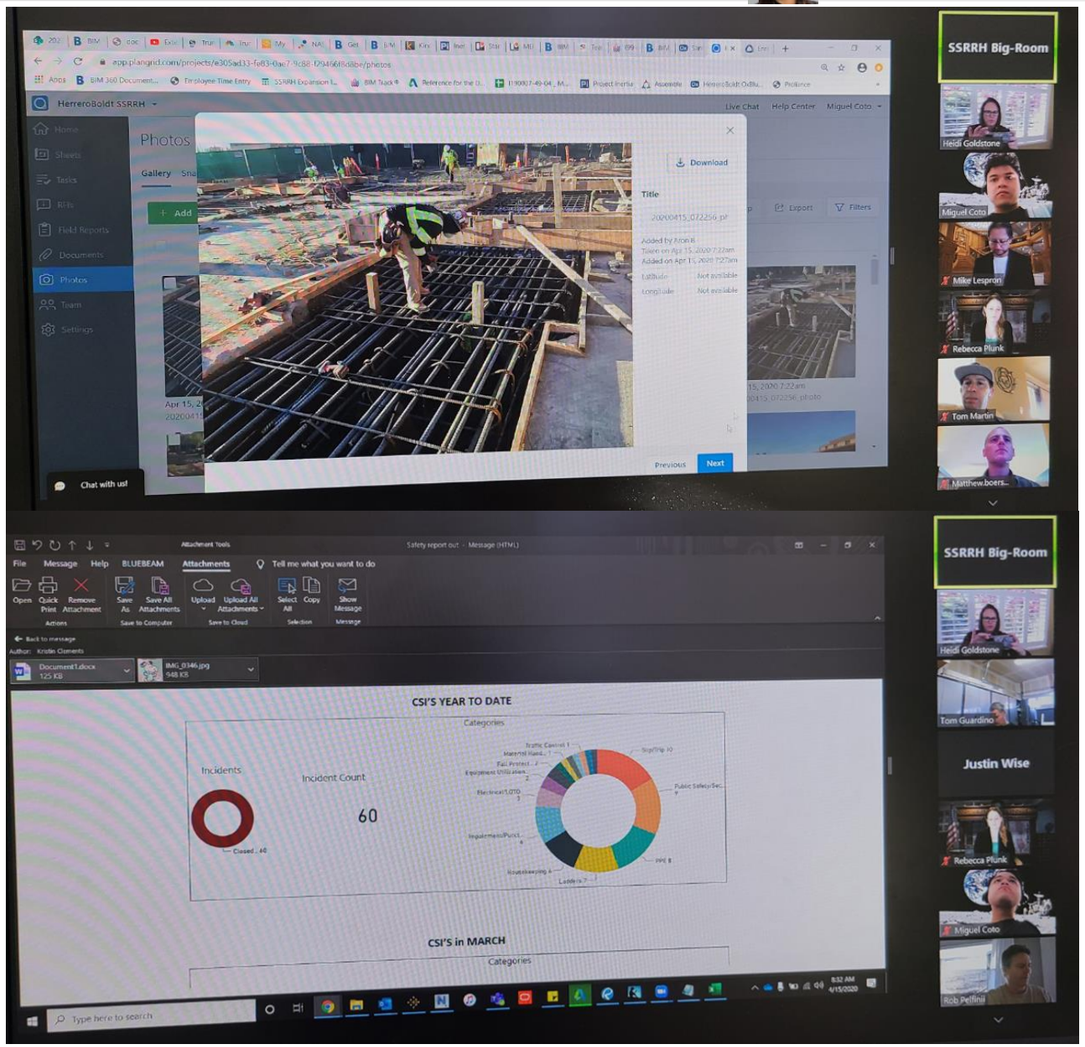
Team Style Pull Planning

- Architect makes request of others to fulfill their needs (constraints)
- Disciplines place activity tags or creates new tags to fulfill the requests
- Straighten tags if it can be committed (and there is no constraints)
- Each discipline follows the same procedure until the pull plan is completed

Pull Planning - Check-ins

- ***Check-in Sessions*** are short, high energy touch points. They are best conducted standing.
- *Each person answers:*

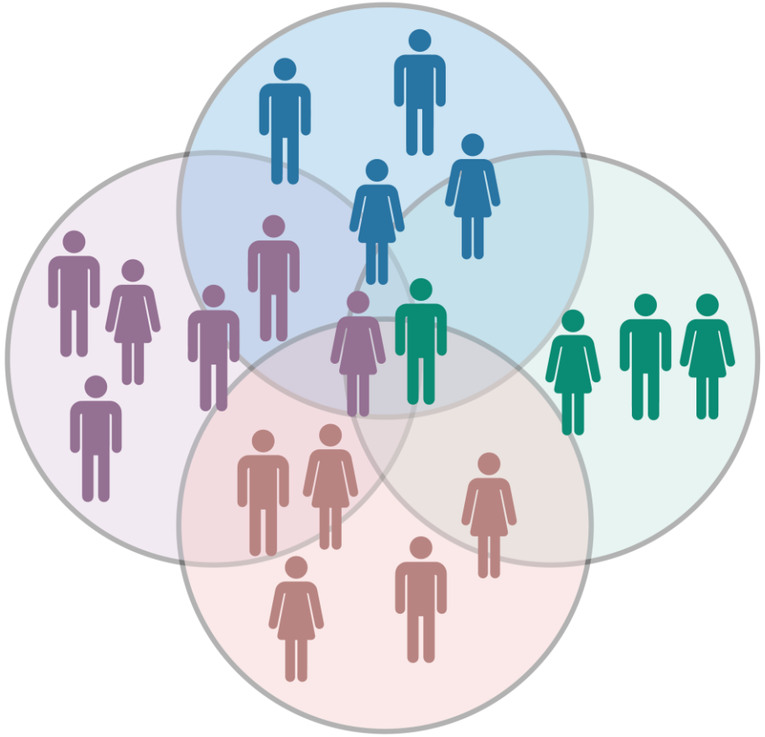
1. What promises I fulfilled (Declaring Done)
2. What promises I will fulfill (Managing Commitment)
3. What are my constraints or concerns (Constraint management)
4. What is the overall status of my commitments (Am I on track)



Courtesy: Stantec Architecture

Cluster Style Virtual Planning

- **Cluster Groups** are smaller work groups responsible for a specific subset of the work
- **Cross Discipline** to include multiple stakeholders
- **Can combine virtual meeting software** with LPS software (VPlanner Pull, etc.)
- **Team meets together** for discussion of milestone and CoS
- **Clusters break out** into virtual rooms to produce micro-plans
- **Team gathers again** to discuss handoffs and merge plans
- **Follow up** to finalize a plan



Team vs Cluster Style

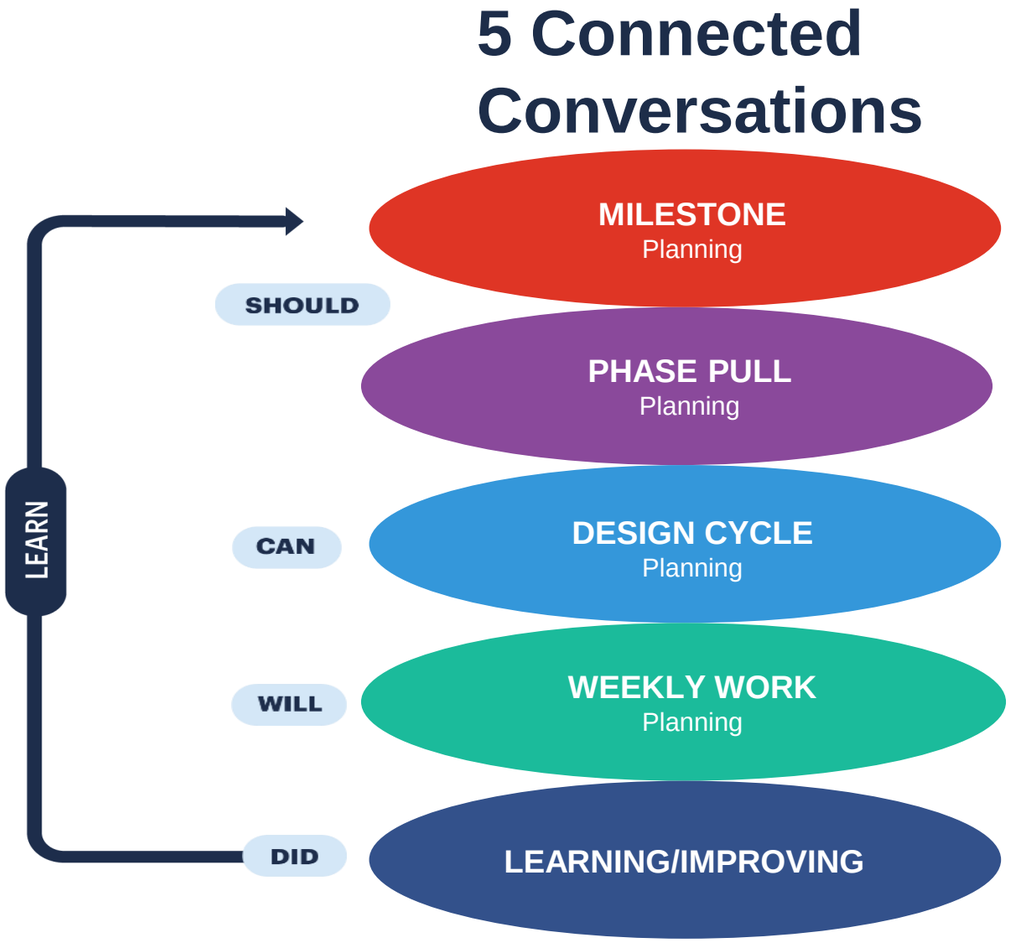

- When to use?
  - Team Approach
    - smaller teams
    - simple projects - few phases, one building
    - shorter duration
  - Cluster Approach
    - larger teams with many stakeholders
    - more complex projects - multiple phase, multiple buildings
    - longer duration

Design Cycle Planning

The third level of LPS is *Design Cycle Planning.*

The goal of this level is to continuously *advance the level of detail* of the Phase Pull Plan in 2-3 week cycles of time.

The conversation at this level is we *“can”* do this.



Scrum

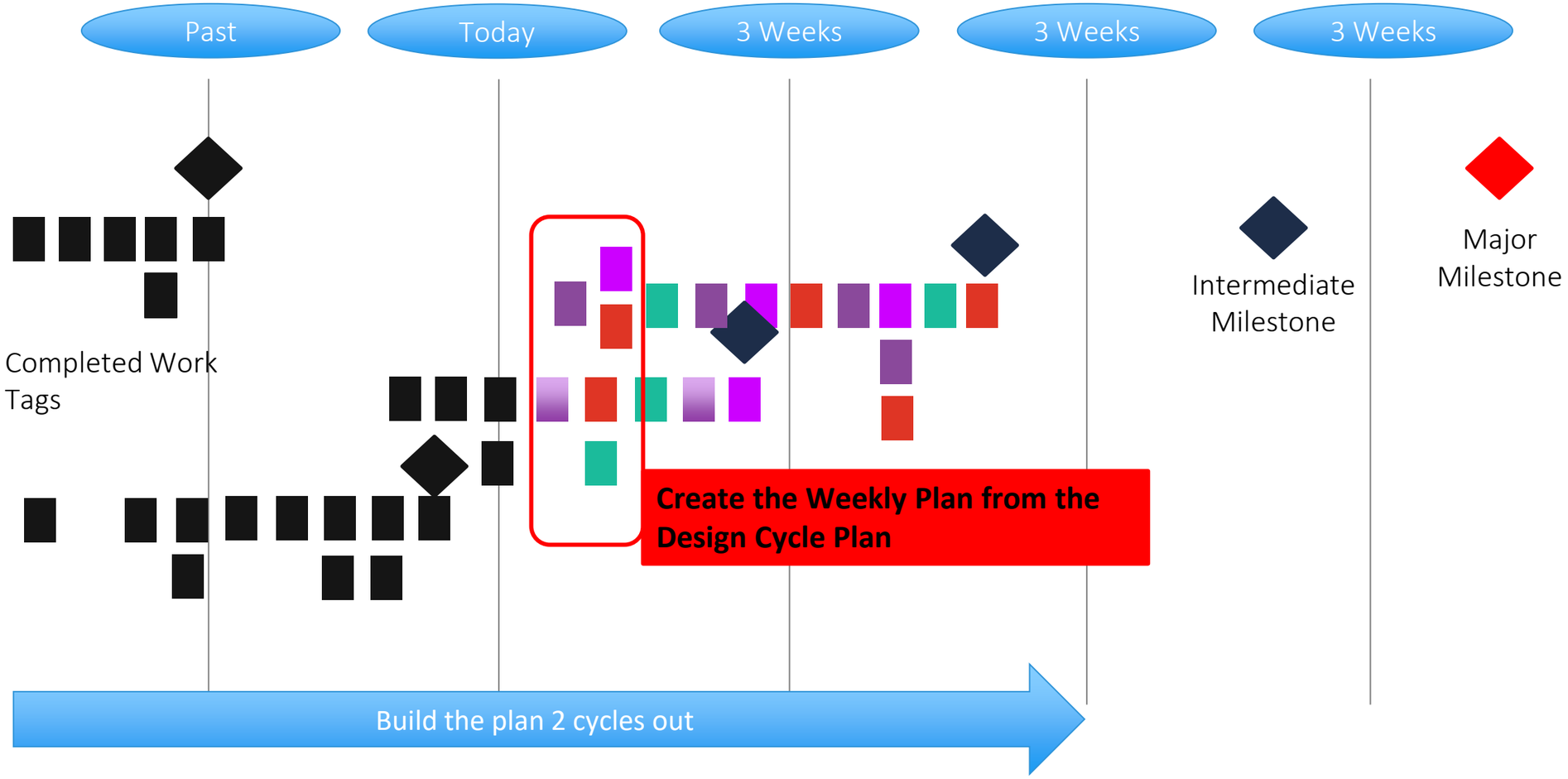
Courtesy: Stantec Architecture

Design cycle planning draws from ***Scrum*** in software design.

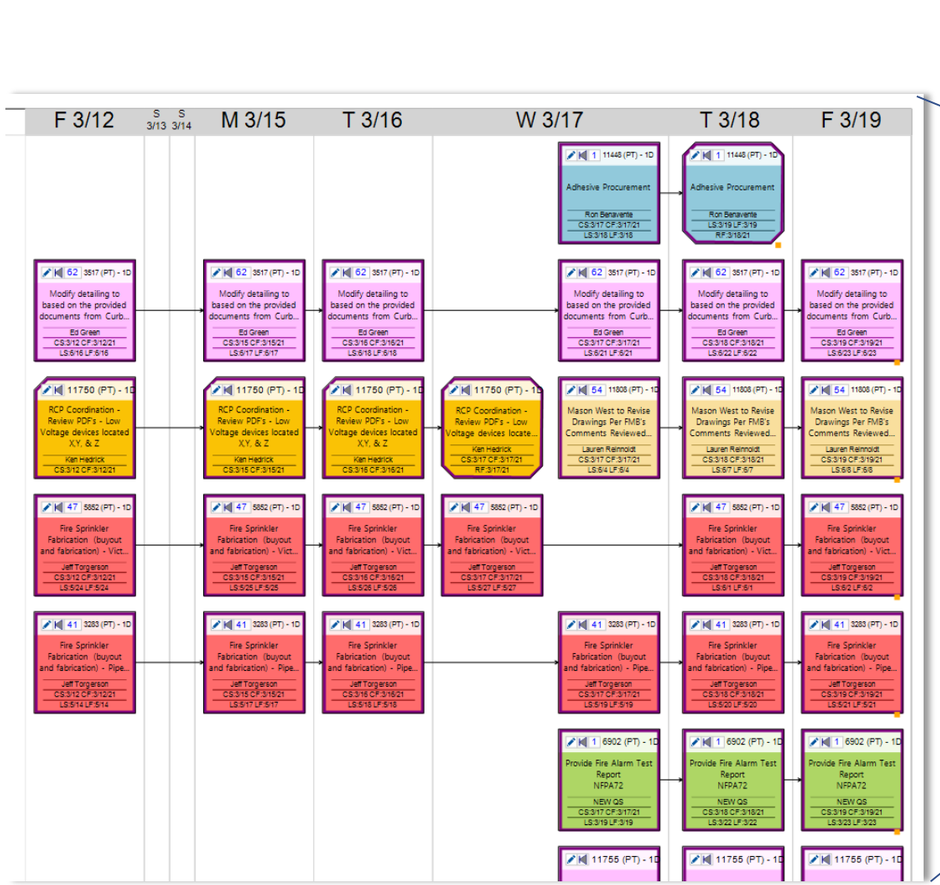
In Scrum, teams focus on determining what work can be delivered in continuous 2-3 week cycles called sprints. This aligns well with design.

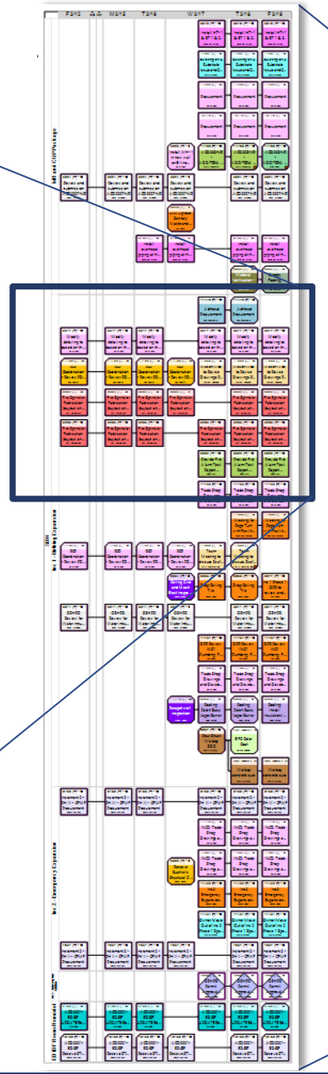
Sprint Process

Weekly Lookahead

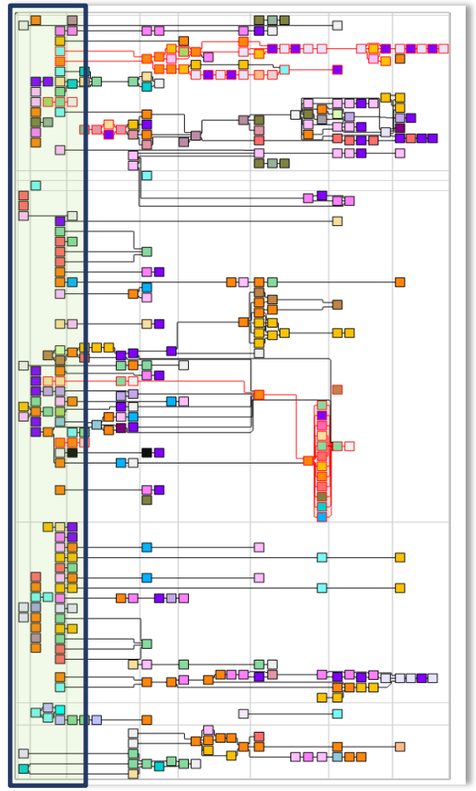


Lookahead Planning





Lookahead



The Work Register

The Work Register is a combination of :

- The Commitment Log to stay on track with the commitments made.
- The Constraint Log to track the roadblocks that arise for any commitment.

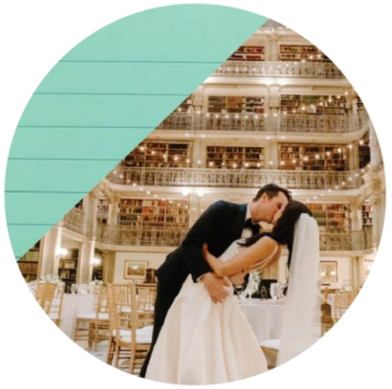
Project:							Constraint Log				
Milestone	Location	Commitment	Performer	Plan Date	Estimated Effort – Days	Task Status	Constraint	Responsible Individual	Resolution Needed Date	Resolution Promised Date	Date Resolved/ New Plan Date

Commitment Log

Constraint Log

Phase Pull Plan Exercise – Wedding


Group 1 Catering and Photography



Group 2 Invitations and Decorating

NAME	DELIVER DATE
MY PROMISE *what I will deliver* *(be specific, small batch)*	
MY REQUEST(S) *what I need from others* *(be specific, person/date)*	

Develop Phase Pull Plan

Put a **date scale** at top (weeks)

↓

Pick a milestone that involves many participants

↓

Color Code by Planning Group

↓

Define the milestone outcome

↓

Pull back from the milestone

65 min – Groups at wall >> 25 min - Debrief

Report Out

Explain the logic

Large Group Discussion 25 min

Weekly Work Planning

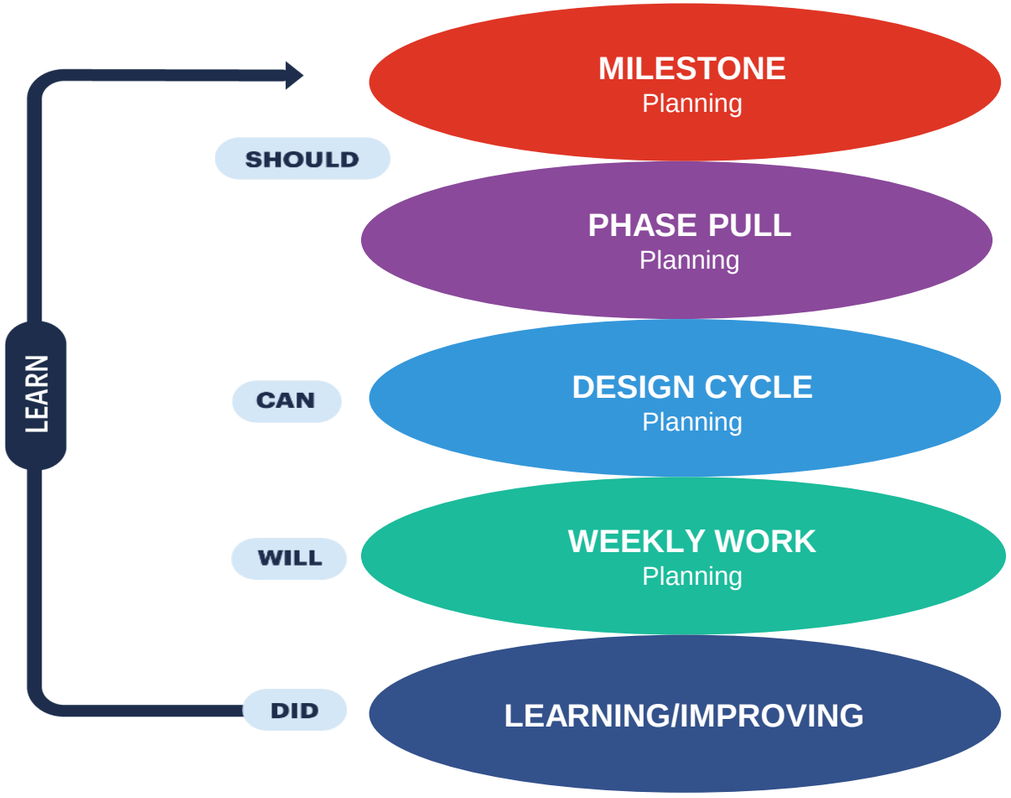
The fourth level of LPS is *Weekly Work Planning.*

The goal of this level is for the Last Planners to *establish the plan* for the upcoming week at the daily level.

At this level a Scrum or Kanban board can be integrated.

The conversation at this level is we *"will"* do this.

5 Connected Conversations



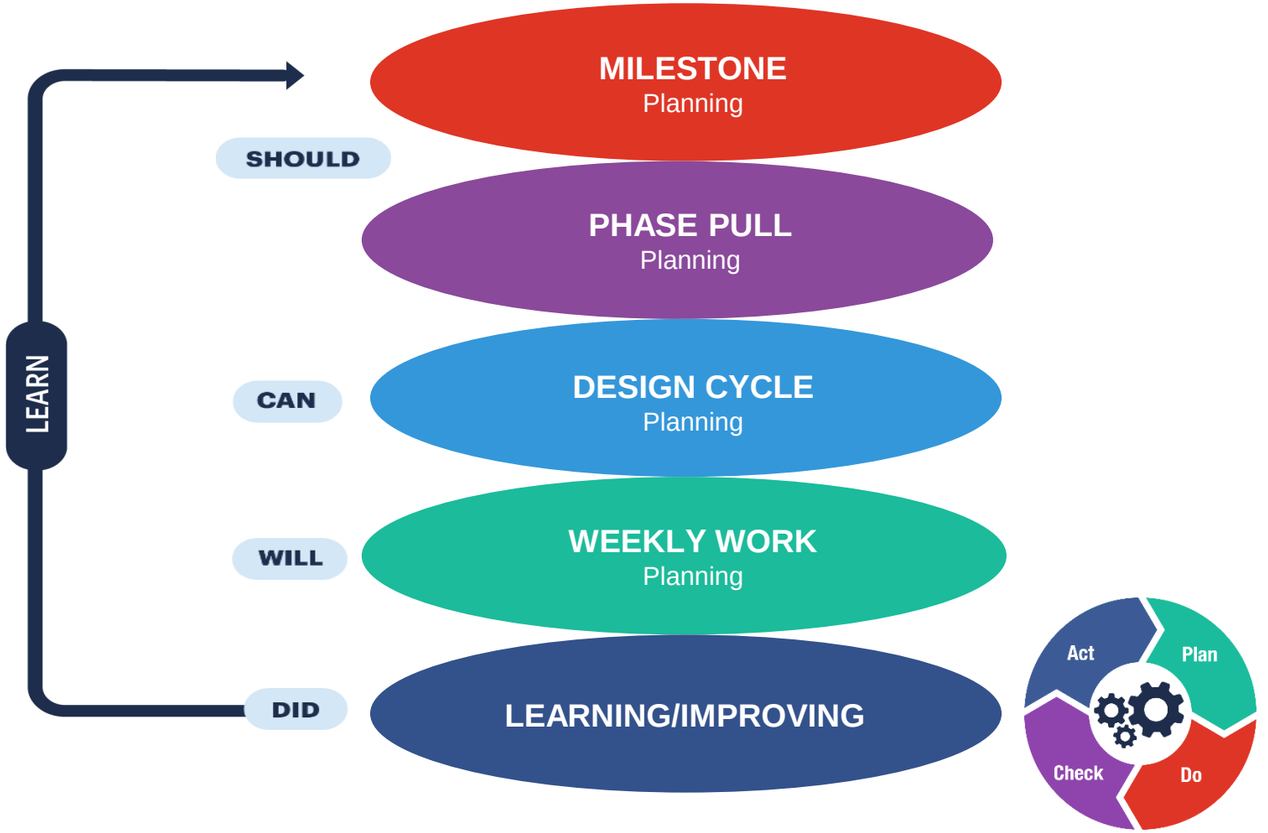
Learning/Improving

The fifth level is *Learning/Improving*.

The goal is for the team to *learn* from the cycle and take *actions for improving* going forward fulfilling PDCA.

The conversation at this level is we *"Did"* and *"Learned"*.

5 Connected Conversations



Learning From Check-in

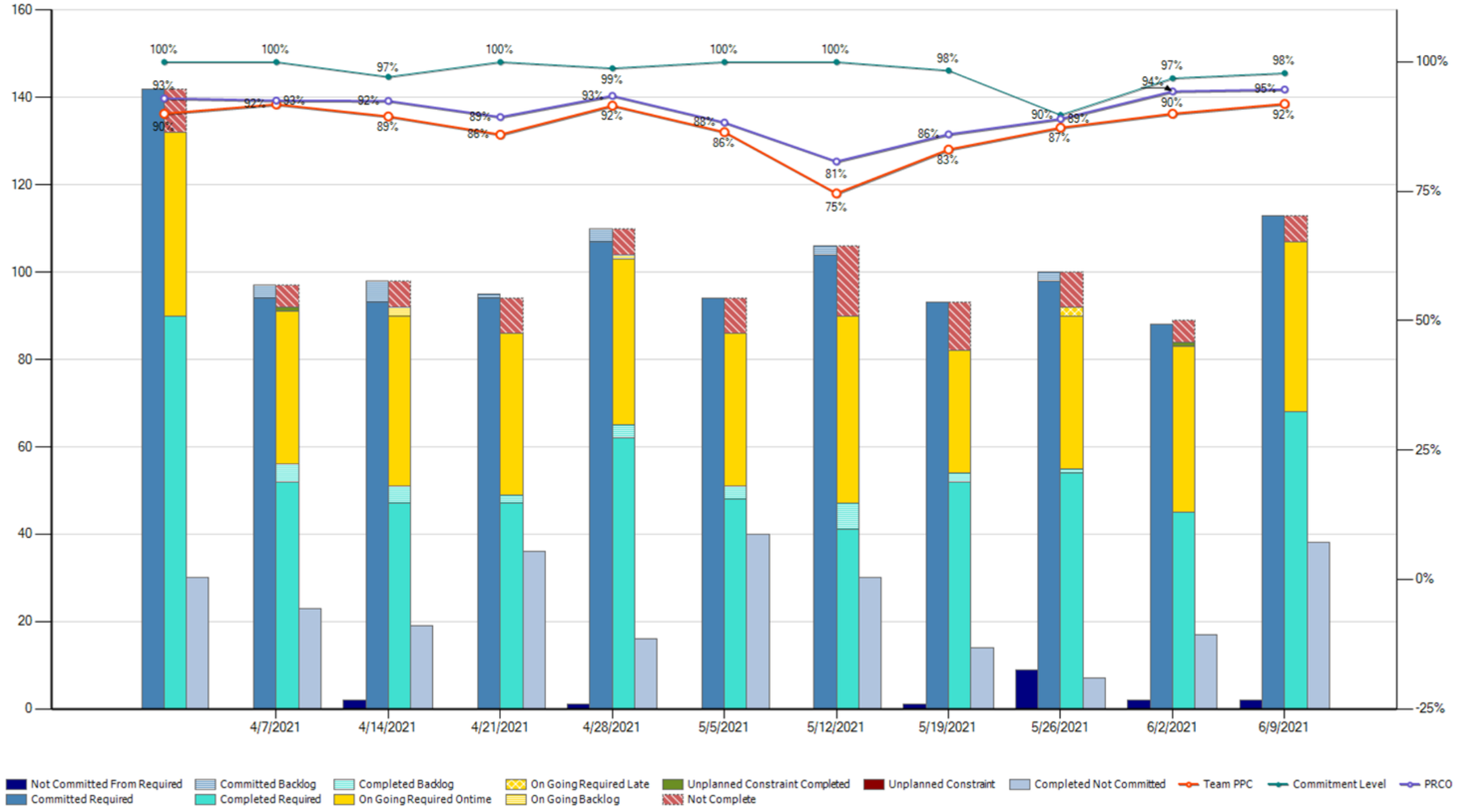
The *Commitment* and *Constraint Logs* are updated live during the Check-in Session.

The *Percent Plan Complete* (PPC) is calculated for the period or week.

PPC is the basic measure of how well the *planning system is working*. It is calculated as the "number of promises/activities completed on the day stated" divided by the "total number of promises/activities made/planned for the week".

Project:							Constraint Log				
Milestone	Location	Commitment	Performer	Plan Date	Estimated Effort – Days	Task Status	Constraint	Responsible Individual	Resolution Needed Date	Resolution Promised Date	Date Resolved/ New Plan Date

PPC/PRCO/Commitment



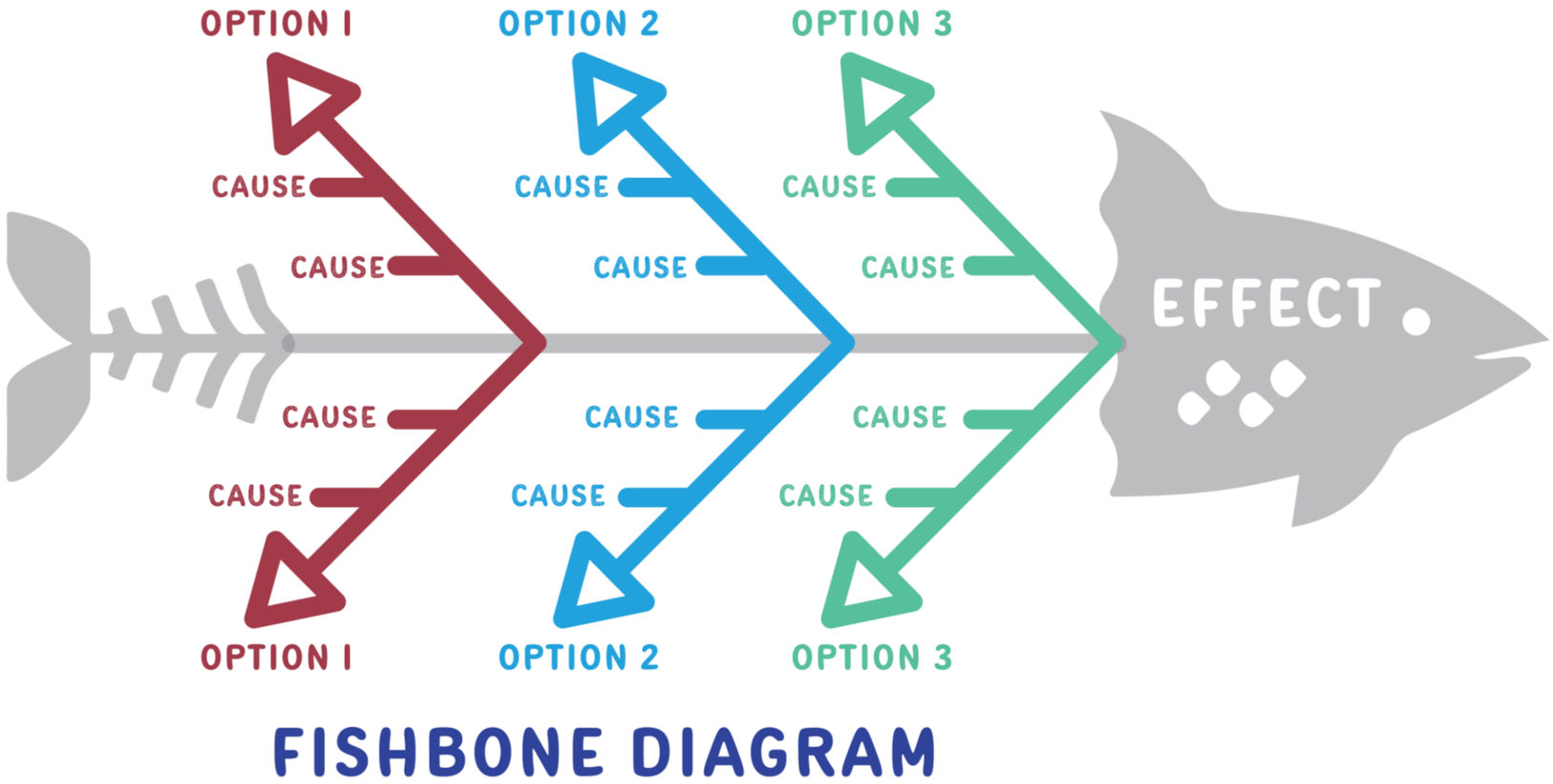
Reasons for Variance

Design Phase:

1. Overcommitted
2. Miscommunication
3. Previous work not complete
4. Change in work plan
5. Outside constraint
6. Resources not available
7. Other

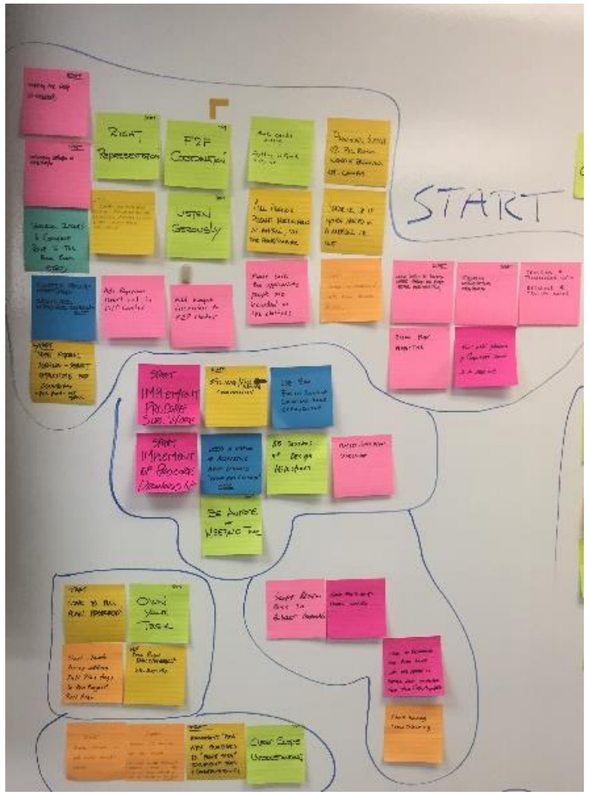
Root Cause Analysis

Root Cause Analysis is a systematic method of analyzing possible causes to determine the root cause of a problem.

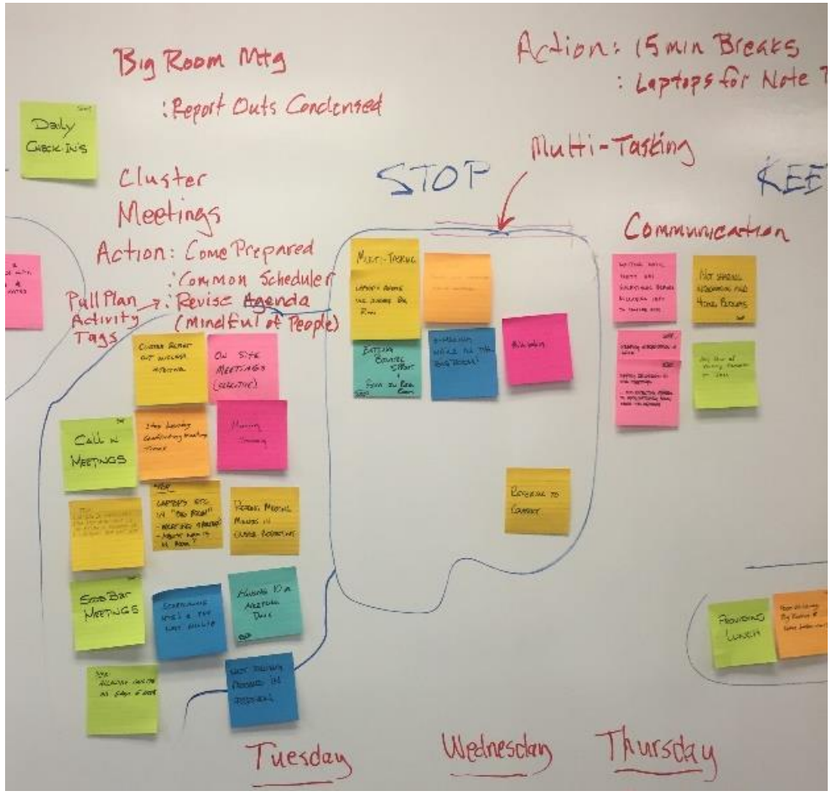


Reflection + Project Intervals

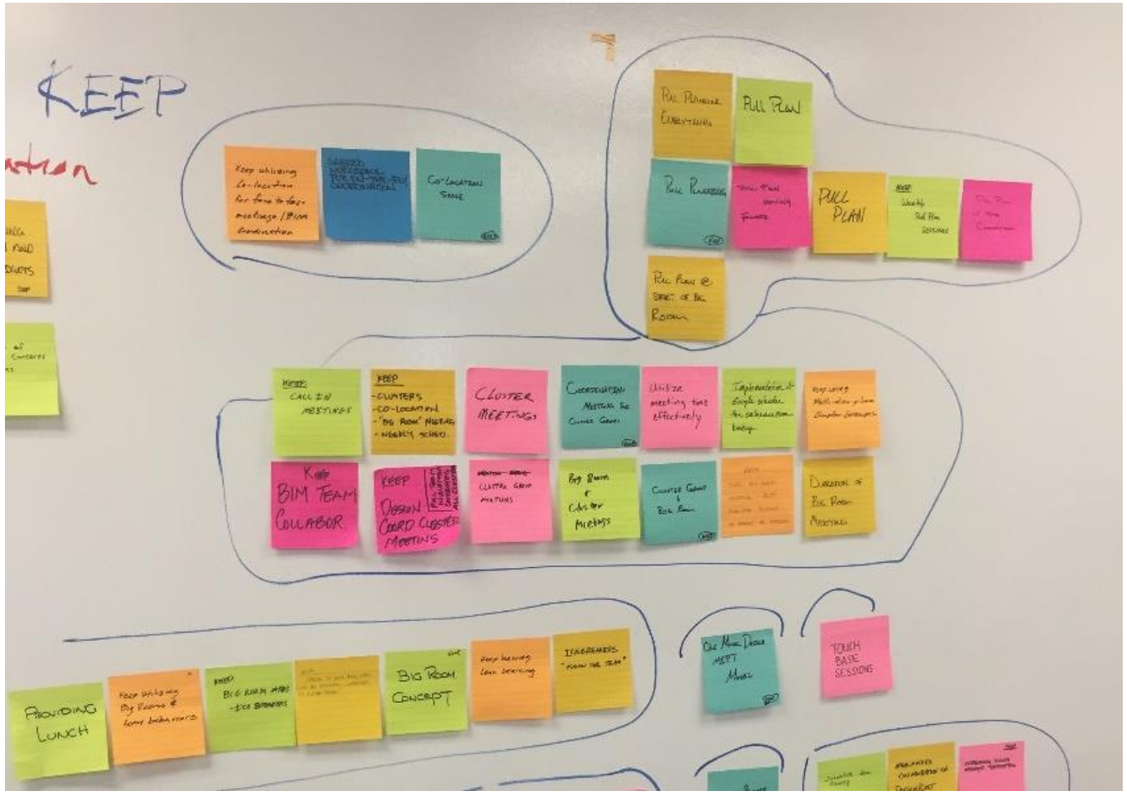
Start



Stop



Keep



Detailed Design → Implementation Docs

Permitting → Construction

Capturing Lessons Learned

IDEA DESCRIPTION	CLUSTERS		Lower=Easier	Lower=Less Impact	
	DESIGN	CONST.	EFFORT (1-5)	IMPACT (1-5)	CHAMPION
Meet with CDPH in SD as they have requirements which can result in change orders at a later date	X		1	5	AOR
Gut entire facility for speed to market.		X	5	5	AOR
CBA - Detailed Room Design	X		4	4	AOR
Throughput Study for Circulation	X		3	4	Planner
Modular pre-fab multi-trade racking and trapeze systems		X	3	3	GC
Bathroom Sizing use Sutter PAC sizing Guidelines for ADA	X		2	3	AOR
Early Scoping w/AHJ's	X		3	5	AOR
Smart metering for distribution and branch panelboards	X		2	4	EEOR
Align on Specification Strategy Early with whole team	X		4	4	AOR
Headwall mockup early; use a surface mounted headwall especially if party wall is rated		X	2	4	GC
Work with the installer for Headwall not the sales person	X		1	4	OWNER
Comprehensive Seismic Anchorage Equip Narrative Plan	X		3	4	SEOR
Lease Warehouse and determine SF of materials to procure early		X	3	5	GC
On-site Staging/Co-lo vs Offsite, decide early		X	2	4	GC
100EUI Building (min), Zero Net Energy (stretch goal)	X		4	4	EEOR/MEOR
Modular Chiller Plant for space saving and power efficiency	X		3	4	MEOR
Pandemic Ready HVAC Systems	X		2	5	MEOR
Trade partner foreman involved in design	X		2	3	GC
Create custom TIO with BIQ Manager during Design	X		2	3	AOR
Early interior experience design concept to go with space planning	X		2	5	AOR

Discussion Question


How to Implement?

What new actions or ideas that you learned today can you take back to your project?

10 min table conversation

Lean Journey to Mastery

How will you reach the next level on your journey?

Unaware

Awareness

Understanding

Competency

Mastery

Introduction to Lean Project Delivery: Classroom, eLearning & Webinar
Introduction to Last Planner® System: Classroom & eLearning
Lean in the Design Phase: Classroom & eLearning
Introduction to Lean in Design-Build: Classroom
The Business Case for Learn: Classroom

Target Value Delivery: Classroom & eLearning (release 2019)
Lean in the Design Phase: Classroom & eLearning
Mindset of an Effective Big Room: Classroom & eLearning (release May 2019)
Last Planner® System in Design: Classroom & eLearning (release 2019)
Conducting Gemba Walks: Classroom

More on Learning

Books:

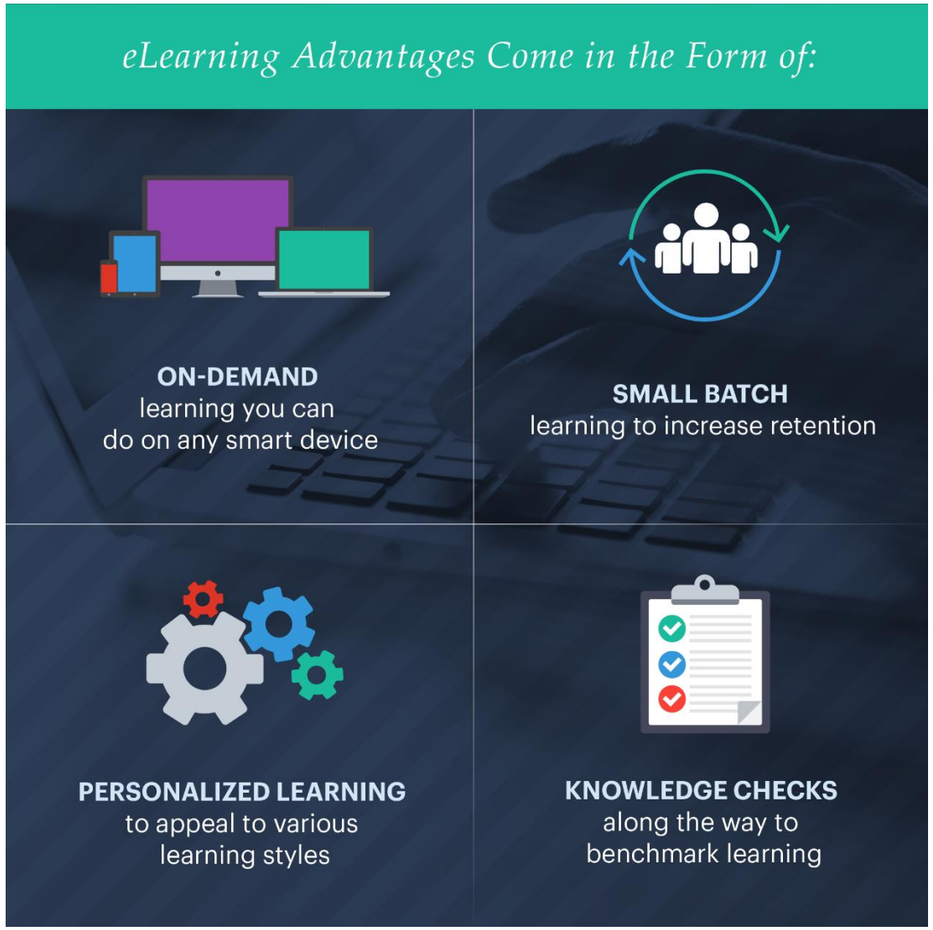
Events:

- Local Community of Practice
- Congress (October)
- Design Forum (May)

Start learning now:
www.LeanConstruction.org

eLearning

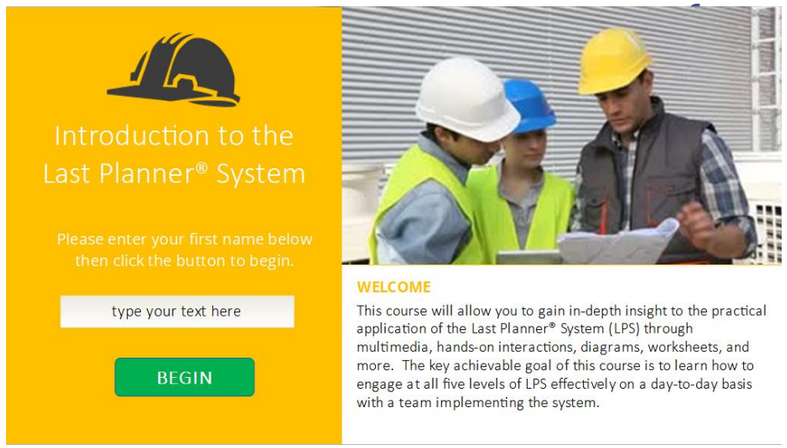
- **Learn on your own time** without taking time off project work
- **Increase knowledge retention by up to 60%** with interactive, small-batch learning
- **Access field resources** to use with teams
- **Earn 1.5 CEUs** (self report to AGC CM-Lean and/or AIA)
- **Incentivize with LCI badging credentials** for email signatures and a certificate of completion
- **Save money** by eliminating instructor and travel expenses
- **Enterprise-level model:** unlimited access to all our eLearning courses directly from your own internal Learning Center or Learning Management System.



eLearning Courses

Available now:

- Introduction to the Last Planner System®
- Introduction to Lean Project Delivery
- Lean in the Design Phase
- Effective Big Room
- Target Value Delivery



PlusDelta

+	△
Plus: *What produced value during the session*	**Delta:** *What could we change to improve the process or outcome?*

https://plusdelta.app/join/CSUK6K

This concludes The American Institute of Architects
Continuing Education Systems Course

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25TH LCI CONGRESS
OCTOBER 24-27, 2023

In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.