

**26<sup>TH</sup> ANNUAL**



**26<sup>TH</sup> LCI CONGRESS**  
**OCTOBER 22-25, 2024**

# **Field Constraint Management Big & Small – No Barnies!**

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**SURFING THE WAVE OF LEAN DESIGN AND CONSTRUCTION**

10.23.2024

# Agenda

- Project Background
- Daily Huddle Scenario
- Definition of a Constraint
- Lifecycle of a Constraint
- Examples
- Embracing Constraints
- Lessons Learned
- Plus / Delta





# Background



# Project “Boogeyman” is Epic



Large Themed Indoor Attraction

Medium  
Outdoor  
Attraction

Large Themed  
Indoor/Outdoor  
Restaurant

Large Themed Indoor  
Retail/Restroom

Small Themed  
Indoor/Outdo  
or Restaurant

Small  
Themed  
Snack  
Kiosk

- Approximately 9 Acres
- \$300+Million

# Project Timeline





# Daily Huddle Scenario



# Daily Huddle Scenario (In Progress)

- Stage of the Project
  - Substructure
    - Early Site Utilities
    - Substructure on Building Pad
      - Deep Electrical, Plumbing, Foundations



# Daily Huddle Scenario



- **Guide Questions**

- Safety Concerns
- What is the scope of work for today?
- Where? / When? / How many people?
- Needs or Constraints?

- **Trade Partners**

- San Diego Electrical
- Padres Concrete
- City in Motion Plumbing



# Daily Huddle Scenario

## SAN DIEGO ELECTRICAL



- "Good Morning: I have 10 workers (2 crews / 5 guys each) working with underground rough-in in Zones B & C.
- "However, **we need to get back RFI 123** to know the final location and layout of the electrical room. We are at **a hard stop** scenario by end of day today if we don't get the answer back. **"I've been sending emails about this for weeks..."**

# Daily Huddle Scenario

## *Padres* Concrete



- "Good Morning: I have 18 workers (3 crews / 6 guys each) forming and tying rebar in Zone A. We should be done with half of the foundations in this zone in a week." **I can't complete** the remaining foundations. We **need to send a RFI** since we don't have dimensions, elevations and anchor bolts patterns for "10 footings" that were added in Bulletin 6 drawings. That is critical to pour foundations per the schedule. Also, **I need** the electrical crews done with their backfill so we can fully take over the area. I talked to their foreman but he **did not commit** to do it".



# Daily Huddle Scenario

## City in Motion

## Plumbing



-"Good Morning: I have 9 workers (3 crews / 3 guys each) installing sanitary pipe in Zone B". **I don't know when we will be done. We need** a coordinated design location for a storm line in the south side of the building. Currently, the storm lines are inside the foundations. **RFI 456** was sent. Also, **we need** the Padres Concrete **to remove their material since we need** to move into the area."

# Daily Huddle Scenario

DESCRIBE THE HUDDLE WITH ONE WORD





# Daily Huddle Scenario

## • Red Flag Words & Phrases...

“I don’t know...”

“Hard Stop...”

“I can’t complete my work...”

“Waiting for an RFI Answer...”

“My predecessor is not done...”

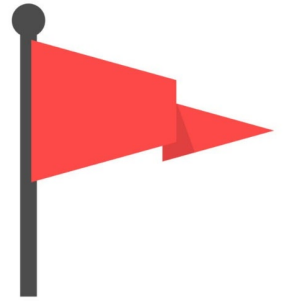
“I need...”

“Delay...”

“Material is on the way...”

“Saying for weeks...”

“That is not in base scope...”



# Daily Huddle Scenario

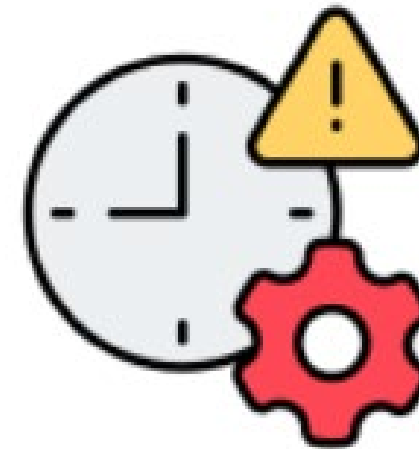
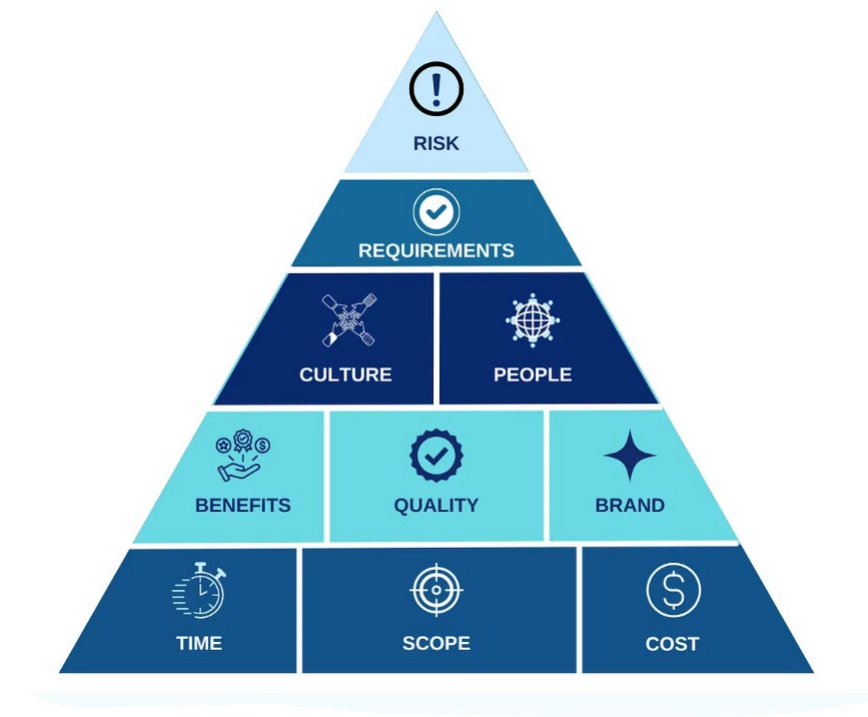
## Questions Lean Leaders ask themselves:

- Is the project on schedule?
- Is there good flow of work?
- Is the critical path in risk?
- Is the team communicating well?
- Is there a positive work environment?
- Are we identifying and solving issues in a timely manner?



# What is the Problem?

- There are too many **constraints** and needs impacting progress and flow of work.
- Constraints are part of the day-to-day operations in every project and need to be managed properly.



# Definition of a Constraint



# General Definition vs Project Definition of a Constraint

- **General:** "An item or requirement that will prevent an activity from starting, advancing or completing as planned"... - (LCI Glossary)
- **Project specific** definition is based on:
  - Project Size
  - Industry
  - Type of Contract
  - Stakeholders
  - Others





# Definition of a Constraint (Project Specific)

## Project “Boogeyman” Constraints:

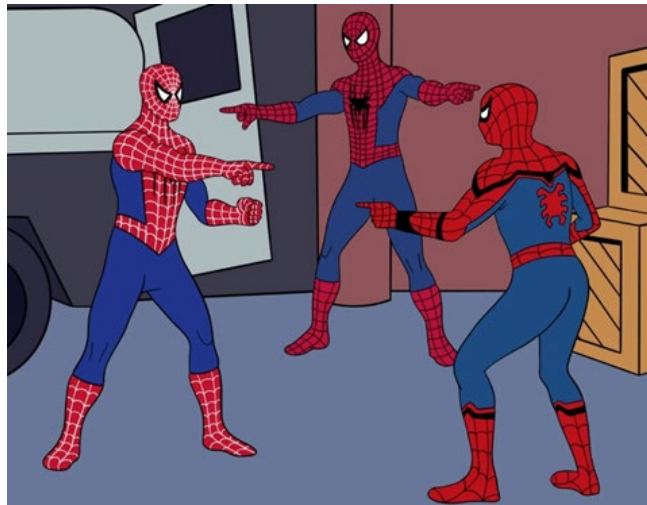
- Resolved externally
- Within 8 weeks of construction
- Any condition impacting any of the following:
  - Cost
  - Time
  - Scope
  - Safety
  - Quality

Constraints are typically owner driven (RFIs / Design Changes / etc)



# Need vs Constraints

## Needs



- Internal
- Often solved with Field Coordination
- General Contractor / Trade Partner Driven
- General Contractor's Control & Manage
- Goal is to resolve them in 24 hours

## Constraints

- External
- Owner / CM Driven
- Often related with design changes
- Owner's Control / Collaborative Management
- Collaborative Tracking

# Need vs Constraints (Examples)

## Needs Examples

- Need Rough-in inspection to hang drywall
- Material on the ground preventing railing layout
- Needed U/G to be complete yesterday for pour
- Need Mockup completed for owner's approval
- Safety Plans & Documentation
- Site Logistics



## Constraints Examples

- Need RFI answer to complete my work
- Design Change / Updated Drawings
- Owner Change Order approval
- Delayed Submittal Review
- Scope Gap
- Long Lead Items

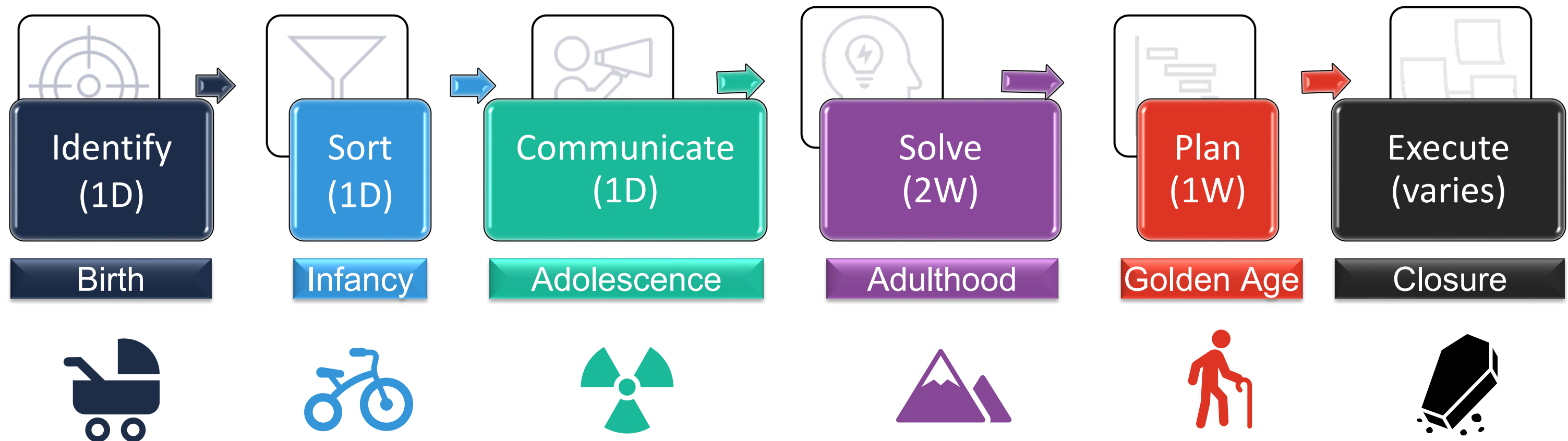




# Lifecycle of a Constraint



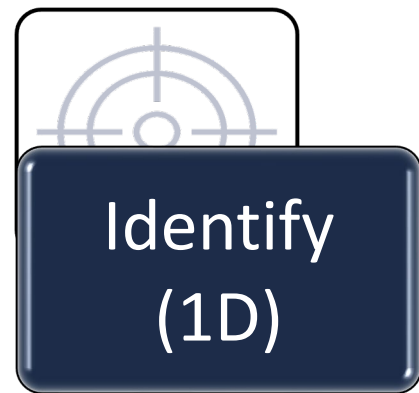
# Lifecycle of a Constraint: Life & Closure of the Constraint



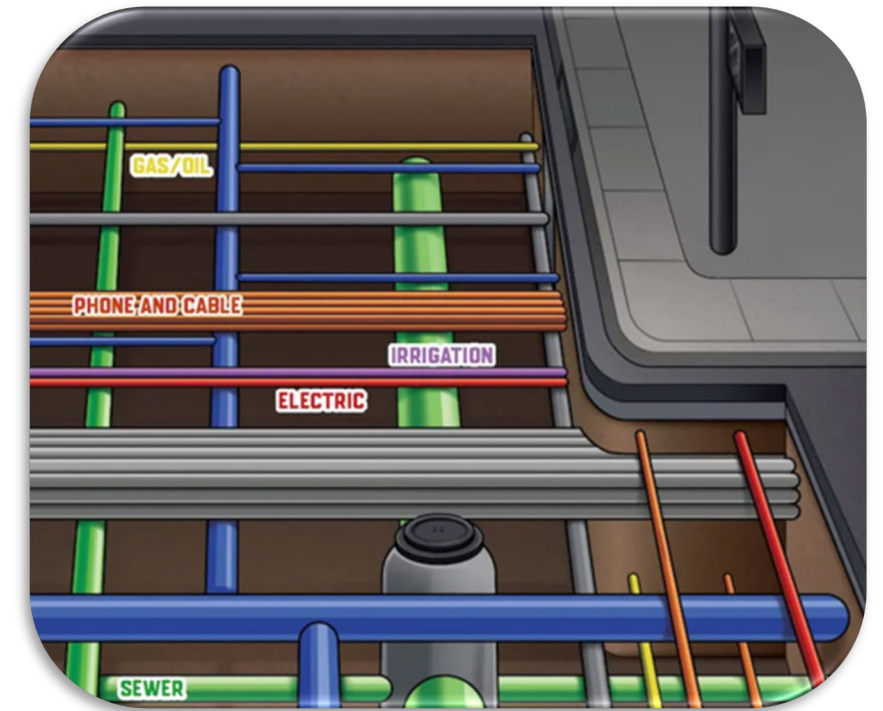
# Lifecycle of a Constraint

## *The How*

- **Proactive Approach Tools (Before the Event)**
  - VDC Coordination
  - Scope Review
  - Constructability Review
- **Reactive Condition Tools (Post the Event)**
  - Last Planner System
  - Gemba Walks
  - Inspection / Code Compliance
  - Design Change



Birth



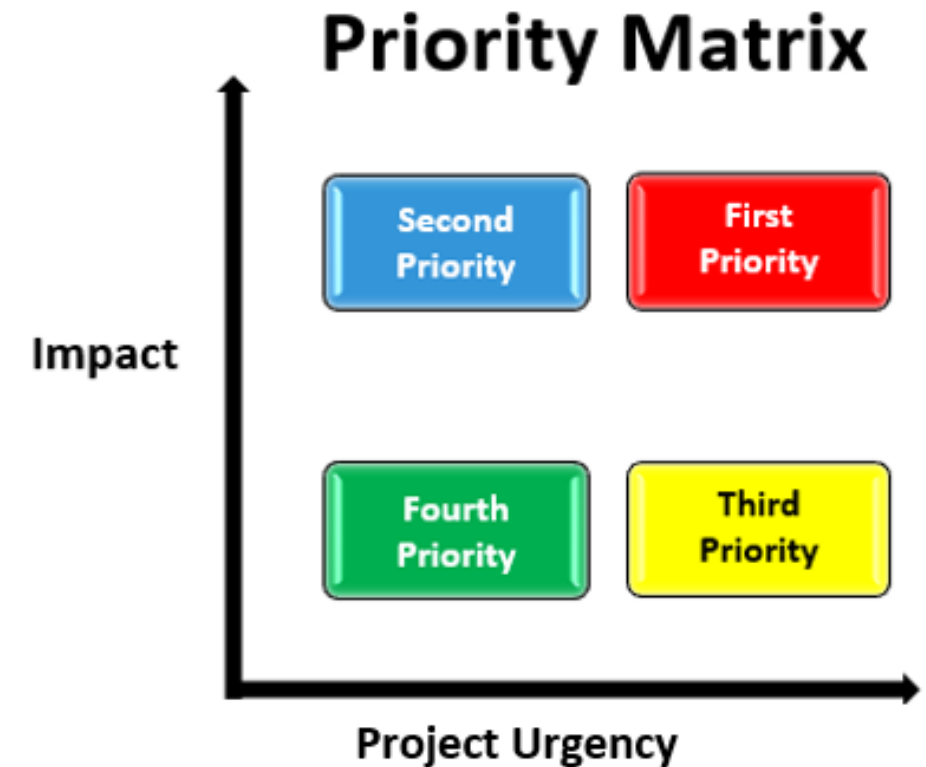
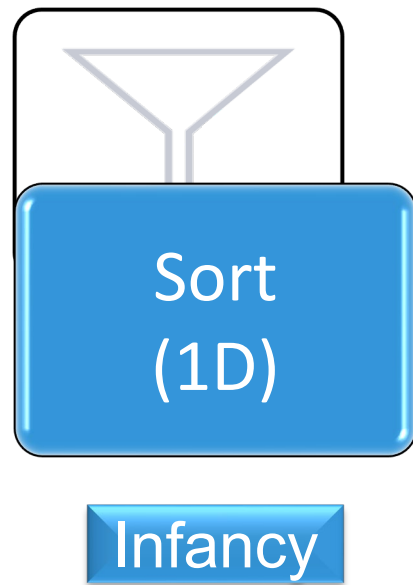
***Validate the existence of the constraint***



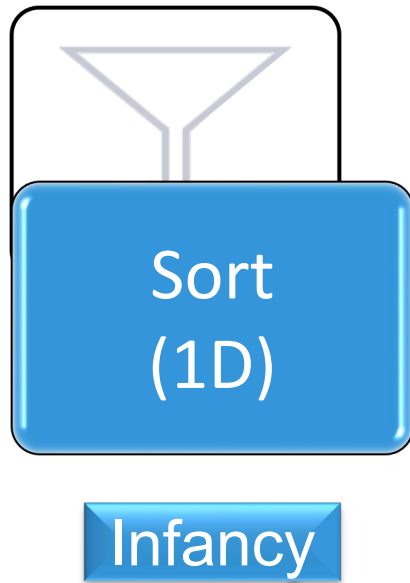


# Lifecycle of a Constraint

- Who is responsible?
- Cost/schedule impact?
- How critical is it?
- **Sorting Tools**
  - Risk Analysis
  - Kaizen / Continuous Improvement
  - Priority Matrix



# Lifecycle of a Constraint



## Priority Matrix

First Priority	High Cost / Schedule Risk
	Work Stoppage / Not meeting contract
Second Priority	High Cost / Schedule Risk
	Resources limitation / High Effort
Third Priority	Moderate Cost / Schedule Risk
	Moderate / Low Effort
Fourth Priority	Low Cost / Schedule Risk
	Minimum / Low Effort



# Lifecycle of a Constraint

- **Internal Communication**

- General Contractor / Subs

- **External Communication**

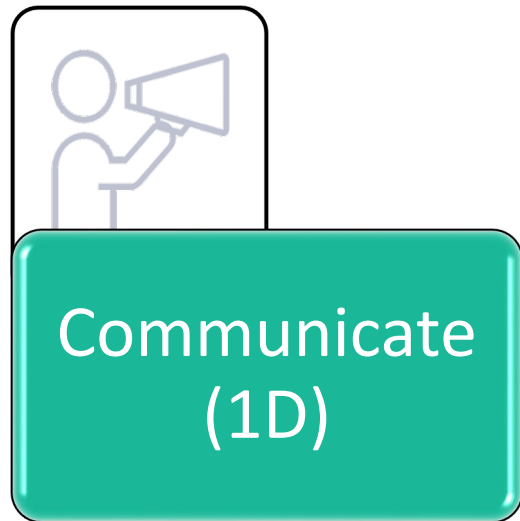
- Owner / Construction Manager / Architect / Engineer

- **Communication Tools**

- Gemba Walks
- Coordination Meetings
- Big Rooms
- Visual Management
- Root Cause Analysis

- **Deliverables**

- Schedule Fragnets
- Delay Letters
- Level of Priority
- Provide Suggested Solution Strategy
  - Issue Request for Information
  - Design Change
  - Value Engineering
  - Others





# Lifecycle of a Constraint

## Manage Solution Strategy from Communication Step

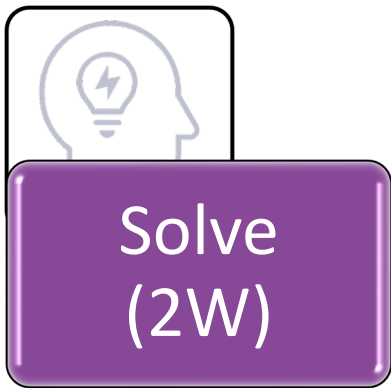
- Set up a Timeline & Assign Responsibilities for each phase

## Solving Tools

- Solutions Strategy Process
- Integrated Solution Sessions
- Spotlight Meetings

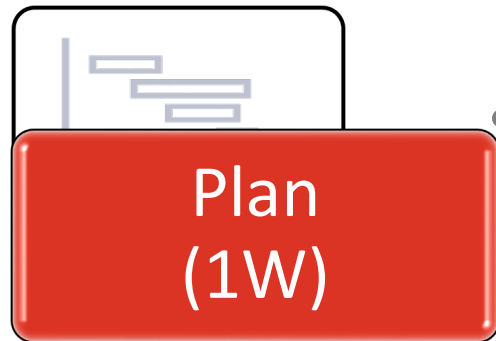
## Solutions & Deliverables

- RFI Response / Design Change / Directive from Owner / Others
- Coordinated Constructability Strategy (Cost / Quality / Safety)



# Lifecycle of a Constraint

- **Digest & Understand Changes with trade partners**
  - VDC & Field Coordination Meetings
  - Base Scope vs Added or Change Scope
  - Duration Assessment
- **Planning Tools**
  - Short Term Planning
  - Visual Management
  - CPM Schedule
  - Safety / Quality
- **Deliverables**
  - Lookahead / Make Ready Plan
  - Sequence Map
  - CPM Schedule Fragnet

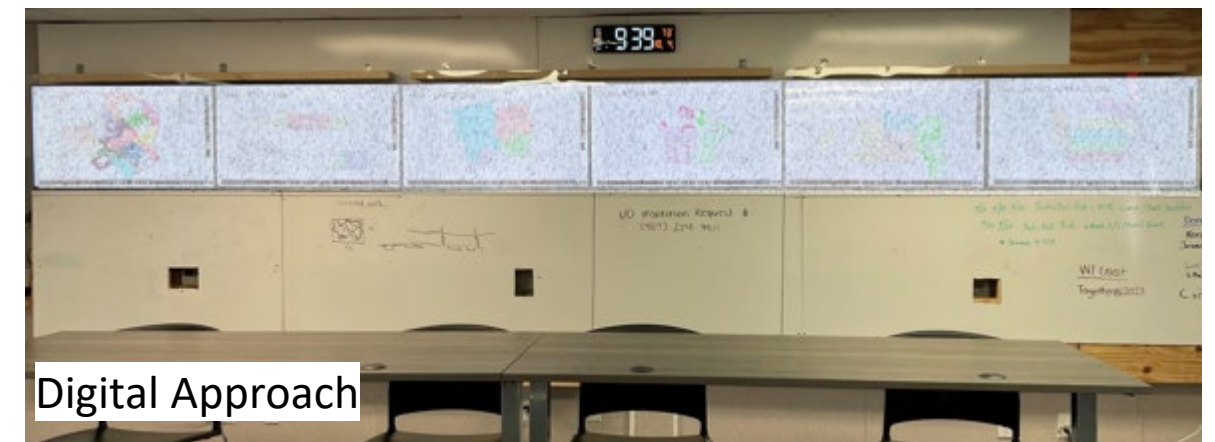
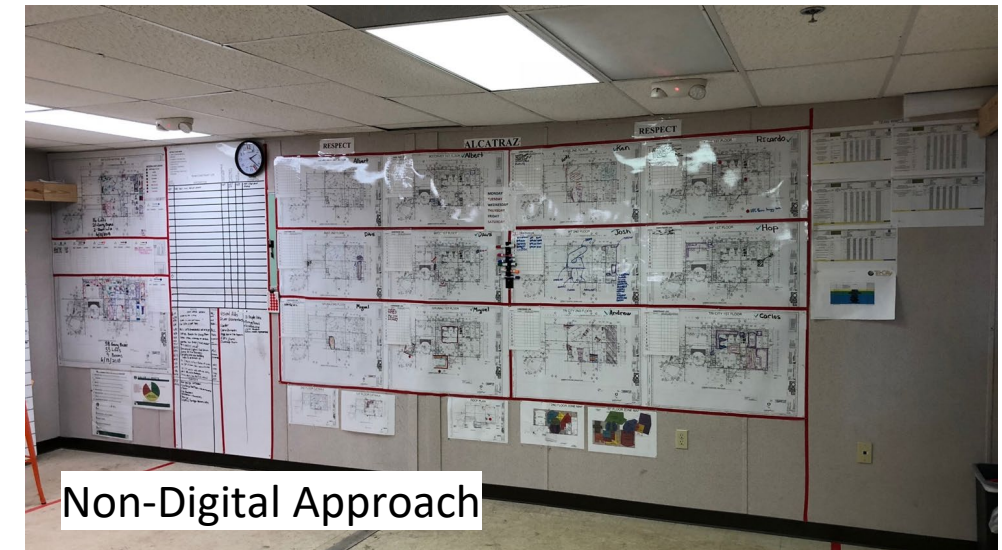


# Lifecycle of a Constraint

- **Enforcing the Plan**
  - Daily Huddles
  - Gemba Walks
- **Tracking & Communicate the Plan**
  - Weekly Work Plan
  - Spotlight Meetings
  - Big Rooms
  - Visual Management
    - Have updated maps / drawing posted in the walls



Execute  
(varies)





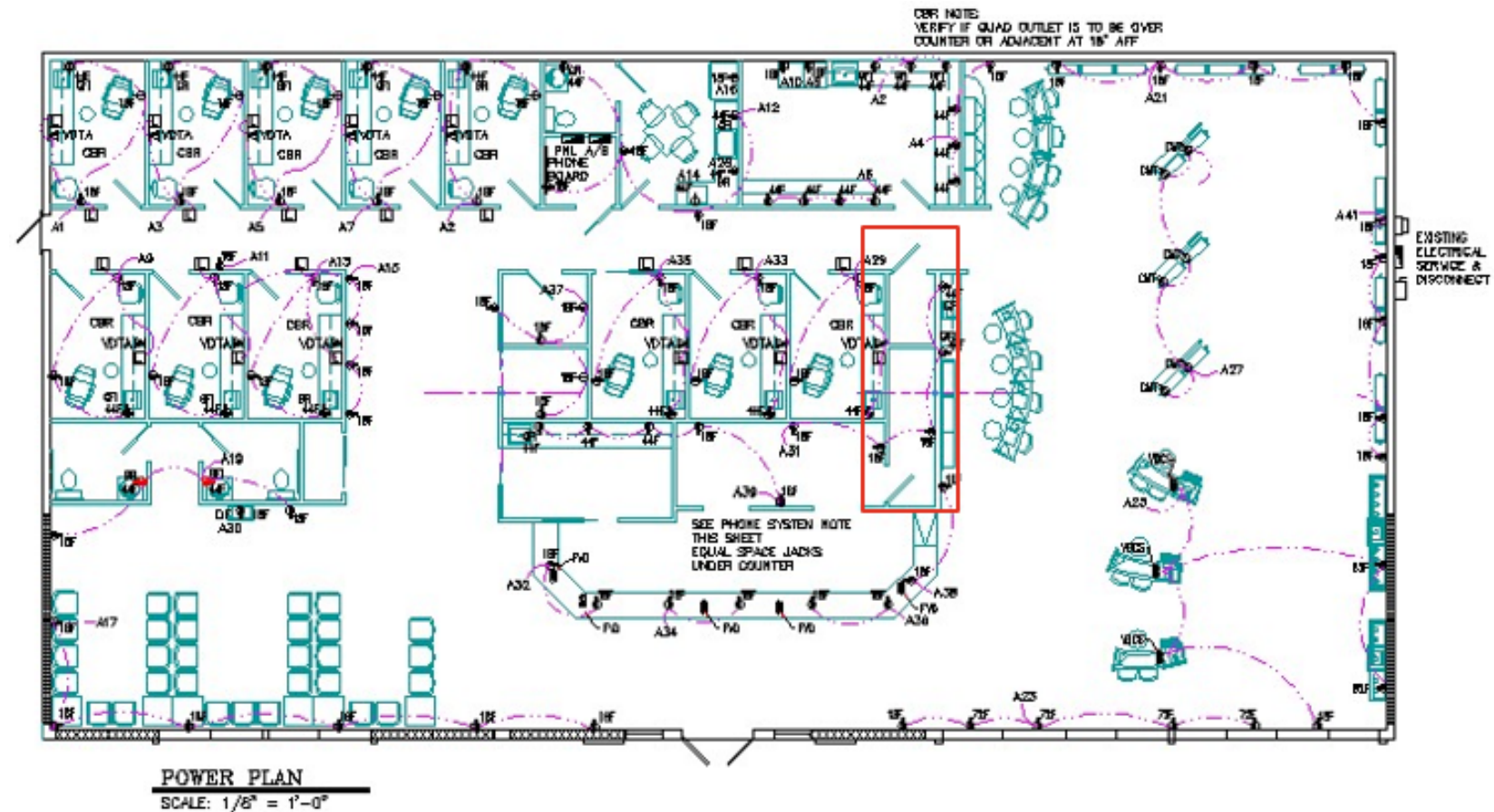
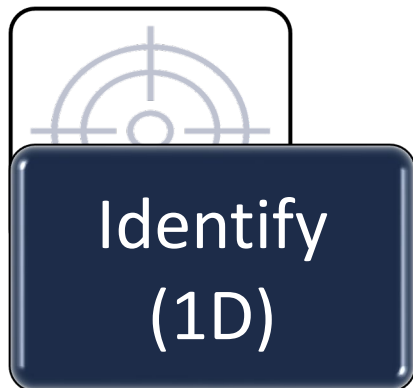
# Constraint Scenario





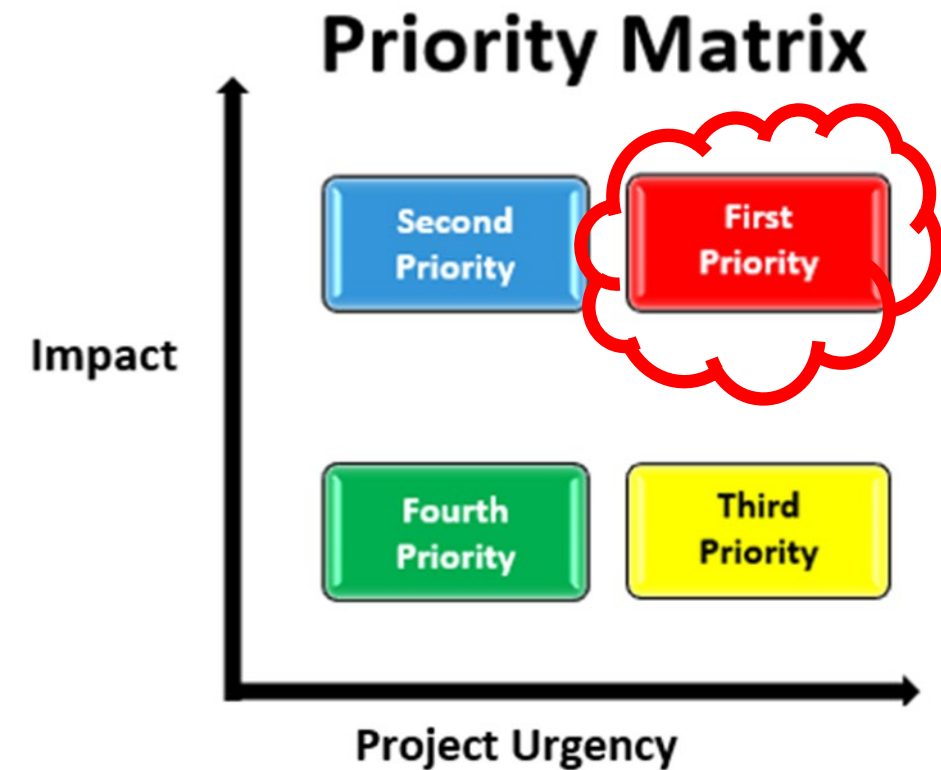
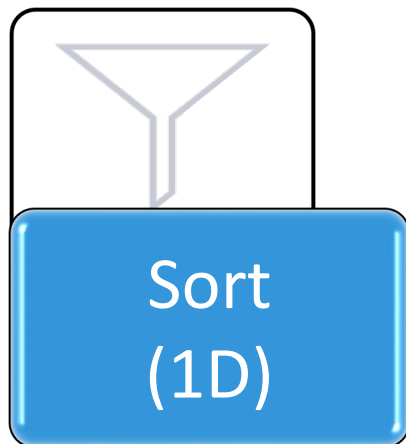
# Constraint Scenario: Dimensioned Drawings

- Contract Drawings did not have any dimensions or elevations provided for rough-in
  - Millwork finishes
  - Owner furnished equipment
  - ✓ In this case: Identified in a Pull Plan



# Constraint Scenario: Dimensioned Drawings

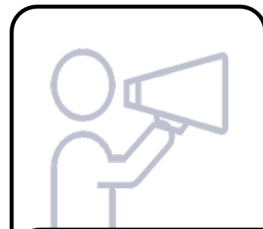
- **Who is responsible?**
  - ✓ GC Field / Office & Trade Partners
- **Cost or schedule impact?**
  - ✓ Yes – Schedule Impact
- **How Critical?**
  - ✓ First Priority
  - ✓ Pushing turnover date of area
  - ✓ Unknown durations
- **Sorting Tools Used**
  - ✓ **Priority Matrix**
  - ✓ Risk Analysis
  - ✓ Flexibility & Adaptability



# Constraint Scenario: Dimensioned Drawings

- **Communication Tools Used**

- ✓ Coordination Meeting with all trade partners
- ✓ Big Rooms
- ✓ Daily Huddles
- ✓ Visual Management



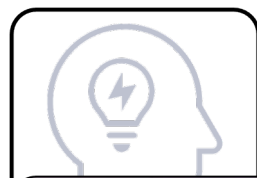
Communicate  
(1D)

- **Deliverables**

- ✓ Track Schedule Impact
- ✓ Suggested Solution Strategy
  - ✓ RFI Issuance

# Constraint Scenario: Dimensioned Drawings

- **Solving Implemented Tools**
  - ✓ Daily walks with Responsible Individuals
  - ✓ Integrated Solution Sessions
  - ✓ RFI Answered / Directive for Design Change
- **Feedback: Not everyone was bought in on the day/time**
  - Not enough time to get drawings updated before work takes place
  - Cost issue – started with separate change order directives
  - Workarounds: Separate Constraints by room / Release are by wall
  - Establish flow of work to eliminate risk of losing resources

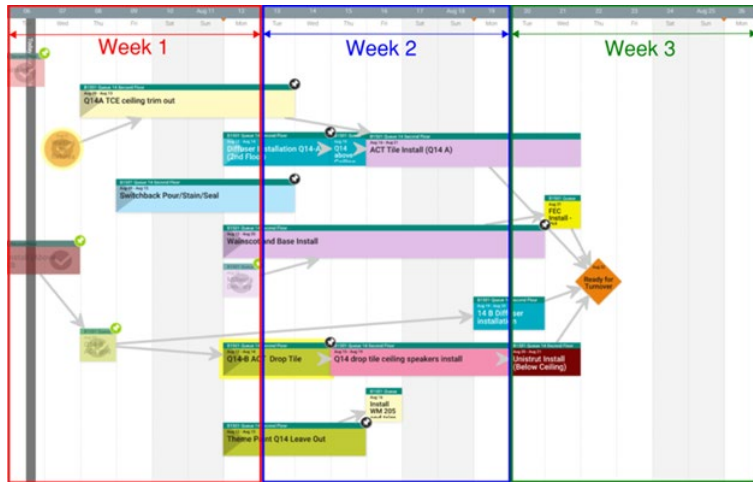


Solve  
(2W)





# Example: Dimensioned Drawings



- **Digest & Understand Changes with trade partners**

- ✓ Field Coordination Meetings

- ✓ Duration Assessment

- ✓ **Planning Tools**

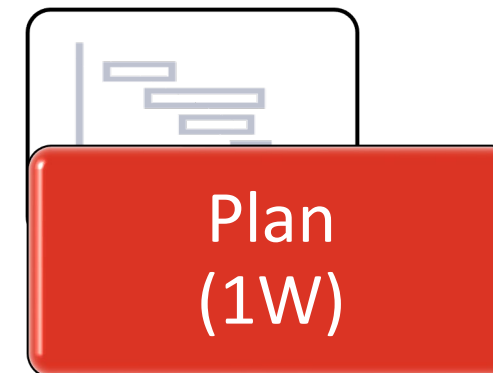
- ✓ Pull Plan / Look Ahead / Make Ready Plan

- **Deliverables**

- Lookahead / Make Ready Plan

- Sequence Map

- CPM Schedule Fragnet



# Overall Feedback from the Project Team

- **Some Trade Partner Feedback**
  - “I can't focus on getting my work done if I'm in the office writing RFI's...”
  - “That's not my RFI to write...”
- **Some Owner Reactions**
  - “Does it really need to be an RFI? Can you just email me...?”
  - “I don't know why is this a constraint...?”
- **Key Question**
  - How did we get everyone's buy in to the process?



# Lessons Learned / Wrap Up

- **Embrace Constraints**
  - Healthy dose of constraints improves or creativity & innovation (*Harvard Business Journal, 2019*)
- **Set Ground Rules / Project Charter Early**
  - Project Glossary & Definitions of Terms
  - Promote acceptable behaviors by minimizing confusion and misunderstandings
- **Project Team Buy In**
  - It is all about communication... communication... communication
  - Train, educate and be respectful
  - Be relentless.. Just do it!





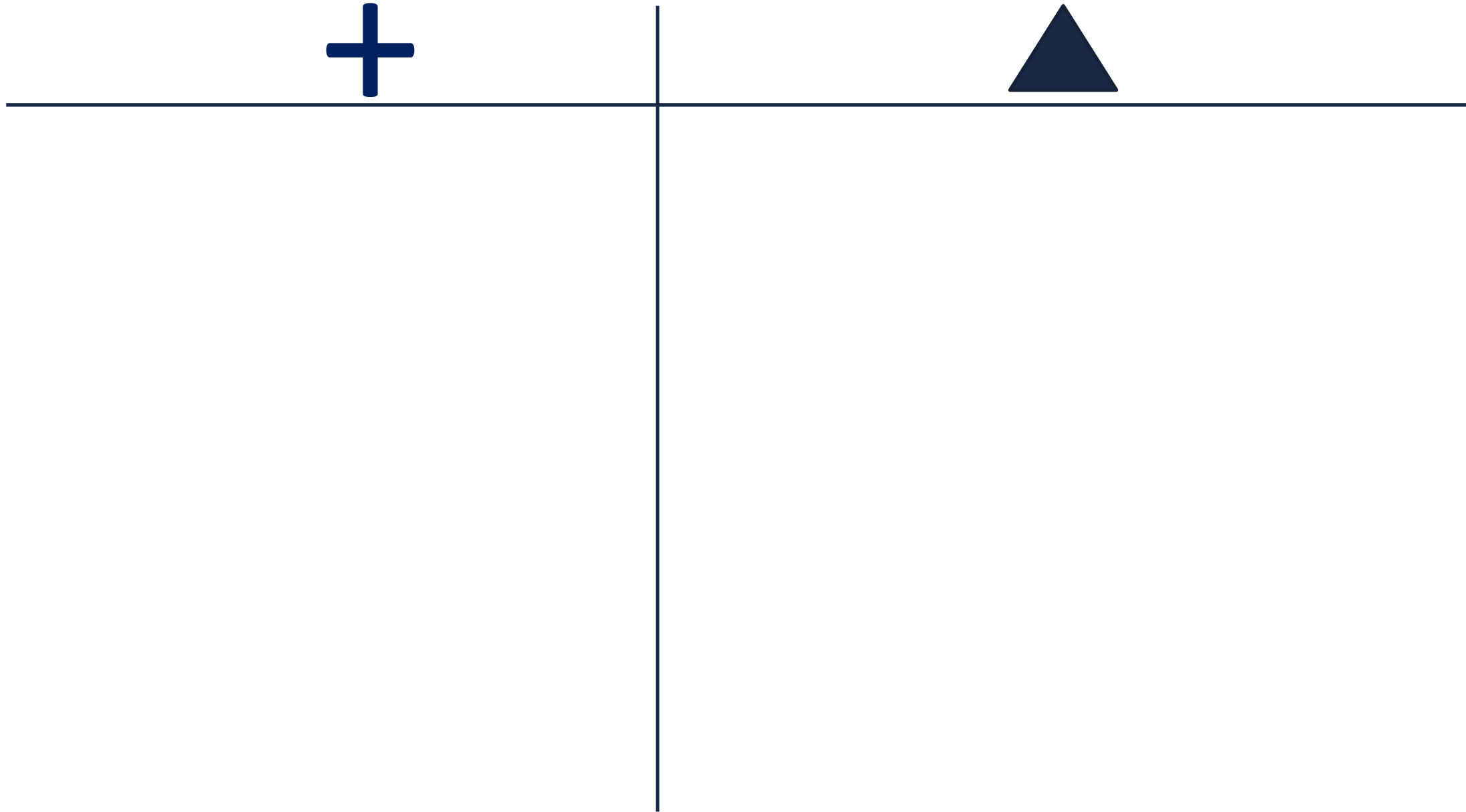
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In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.



# Plus / Delta



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Thank you for attending this presentation. Enjoy the rest of the 26<sup>th</sup> Annual LCI Congress!