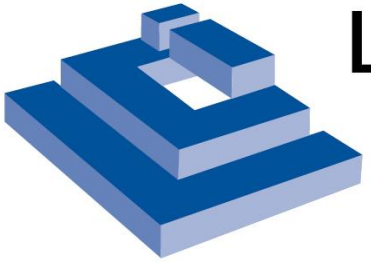


Lean Construction Institute

Building Knowledge in Design and Construction

Provider Name: Lean Construction Institute
Provider Number – H561

Course Name: Improving the Way we Work: Implementation of Lean on Projects, Case Studies and Lessons Learned.

Course Number – 20121011AM

Course Speakers: Bernita Beikmann, Digby Christian, Ken Lindsay, Paul DeChant, James Grossman, Chris Dierks, John Hugget, Sam Moses, Brian Lightner, Brad Carter

Course Date: October 11, 2012

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.

This course is registered with AIA CES 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.

Copyright Materials

Course Description

This session incorporates testimonies and case studies from participants in projects that used lean methodologies to improve the design of their facilities and change the way they deliver a project in design and construction. The case studies will dive deep into specific tools and techniques that will improve the quality of buildings, create a safer and more reliable work environment, and improve the design and construction practice.

Learning Objectives

At the end of the this course, participants will be able to:

1) Learn how an owner applied Lean Methods and Practices to redesign healthcare operations within a facility and improve the delivery of patient care with improved work flow and facility operations and overall improve the patient experience.

2) Examine Case Studies from multiple projects in California, Illinois, and North Carolina and learn how incorporating 5s, increased levels of technologies including BIM, and other Lean Process Improvements has improved the schedule, quality, and communication on those projects.

3) Discover how incorporating Takt Planning and Daily Huddles in your Project can improve reliability with Construction Delivery.

4) Learn how incorporating pull planning techniques and the Last Planner System into the delivery of your project in design and construction will help facilitate communication between building system participants, help deliver your project on time, and create a safer construction site.

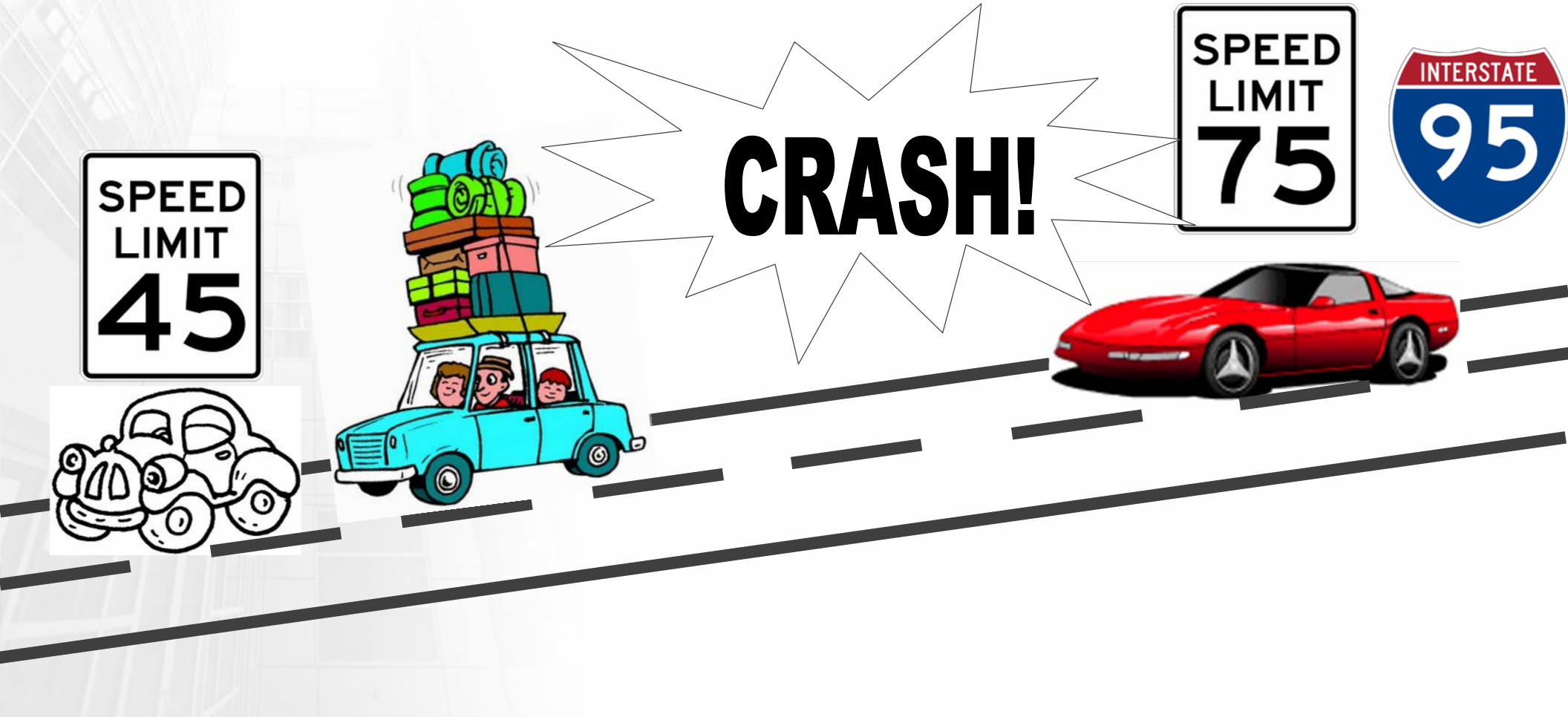
Integration of Lean Tools & Takt Planning

2012 LCI National Conference – Arlington, VA

Presented by: John Huggett, Dan Wagner & Paul Christensen

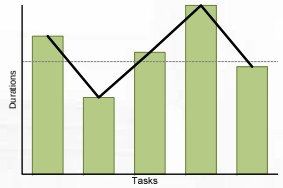
BOLDT®

What's the Problem?



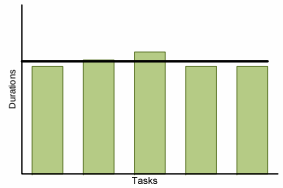
What's the Problem?

Sequence Driven Schedule



Variable Pace Dependent on Trade

Takt Driven Schedule



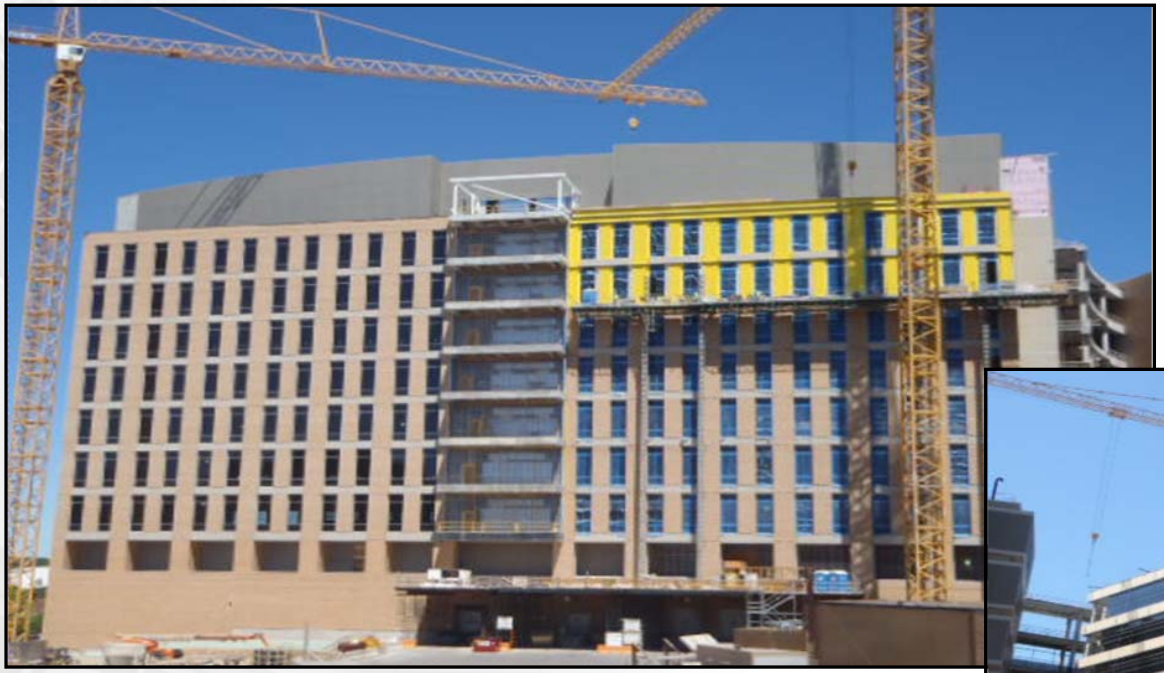
Defined Pace for All Trades

Our Lean Journey

"***Every great journey begins with a single step***…"

Chinese Proverb

Project Background



Wisconsin Institutes for Medical Research Center Tower

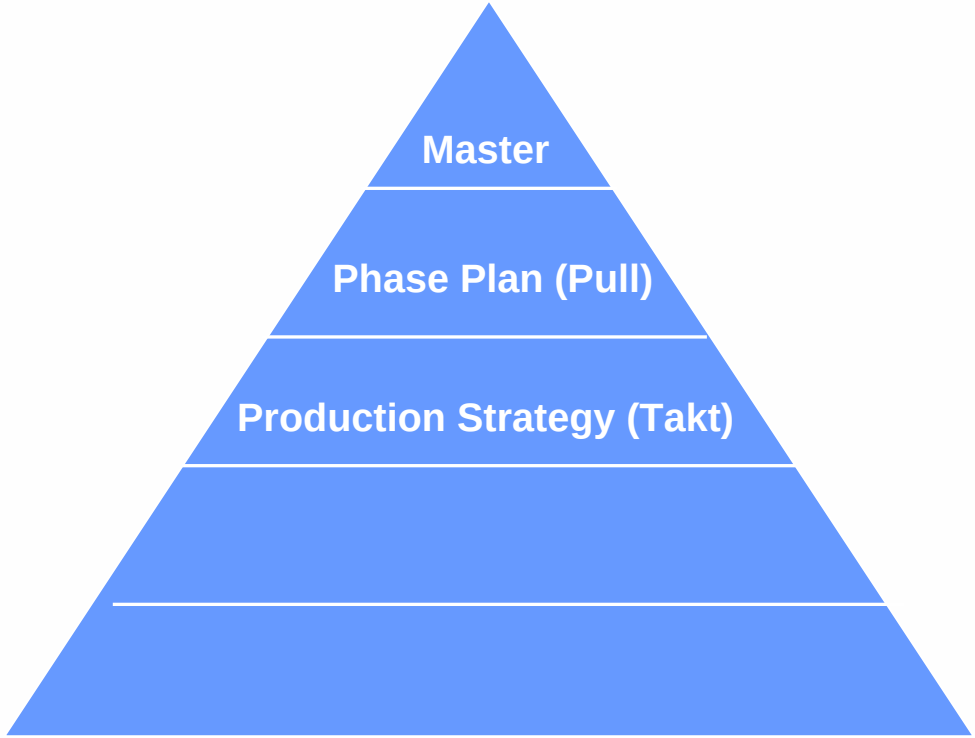
Madison, WI

The Plan

- Establish Culture
- Create Vision
- Develop the Plan
- Communicate the Plan

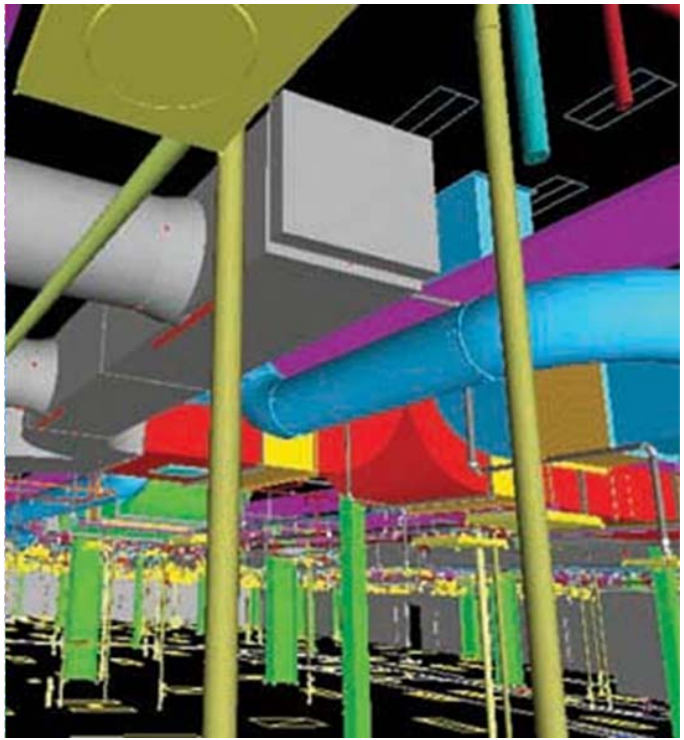
Lean Tools

- A Layering Process
- Establish Flow
- Level Workforce



Production Strategy

- Sequencing of Work
- Eliminating Unproductive Work



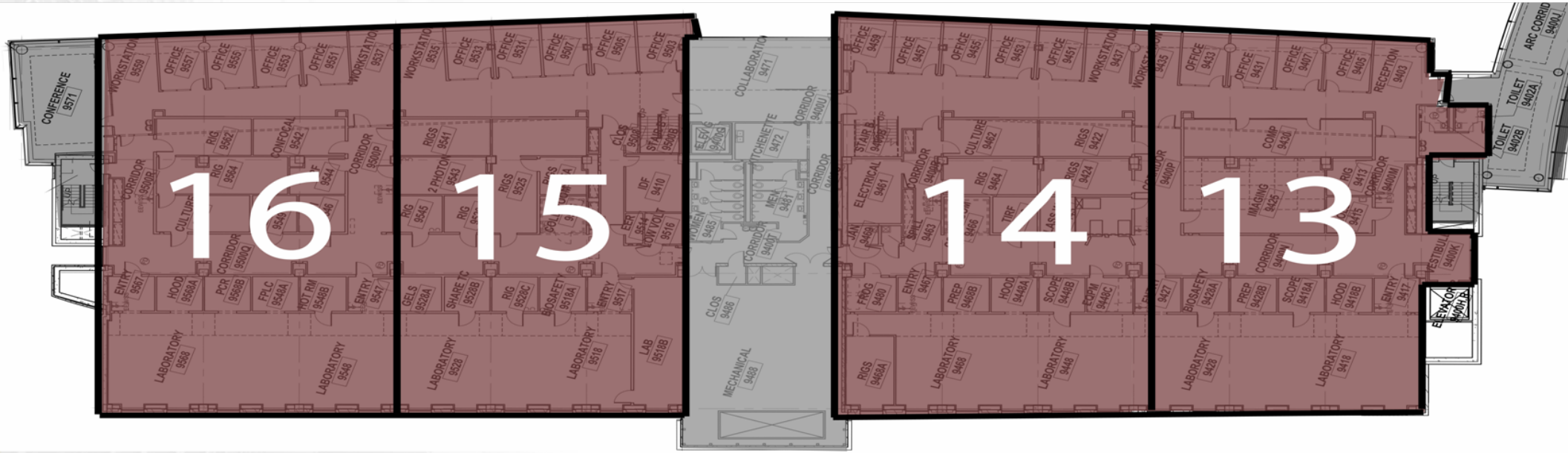
Using Takt Planning

- Developing the Plan with Predictable Pace

Floor	Sector	Sector	Car	Scope Description	Crew #	Crew Size	Subcontractor	Checklist to be completed in Latista	10/8/12	10/15/12	10/22/12	10/29/12	11/5/12	11/12/12	11/19/12	11/26/12	12/3/12	12/10/12	12/17/12	12/24/12	12/31/12	1/7/13	1/14/13	1/21/13	1/28/13
	13	Sect 13	Car E1	Drywall & Insulation		4	Wall-Tech	09 21 16.02	4																
		Sect 13	Car E2	Tape, Sand & Finish		6	Wall-Tech	09 21 16.02		6															
		Sect 13	Car E3	Chilled Beams in Ceiling Framing		2	H&H-HVAC	CV 23 82 00			2														
		Sect 13	Car E4	Controls Devices Finishes	N-1	2	NAMI	CV 23 09 14				2													
		Sect 13	Car E4	Chilled Beams Branch Piping (High)		2	H&H-HVAC	CV 23 82 00				2													
		Sect 13	Car E5	Chilled Beams Branch Piping (Low)		2	H&H-HVAC	CV 23 82 00					2												
		Sect 13	Car E5	Chilled Beams Duct Connections		2	H&H-HVAC	CV 23 82 00					2												
		Sect 13	Car E5	Lighting Whips & Wire (1 of 2)	P-8	4	Pieper Electric	CV 26 61 13					4												
		Sect 13	Car E6	Chilled Beams Pipe Connections		2	H&H-HVAC	CV 23 82 00						2											
		Sect 13	Car E6	Lighting Whips & Wire (2 of 2)	P-8	4	Pieper Electric	CV 26 61 13						4											
		Sect 13	Car E6	Fire Stopping		2	Hamilton Benchmark							2											
		Sect 13	Car E7	HVAC Piping Flushing & Cleaning		1	H&H-HVAC	CV 23 82 00							1										
		Sect 13	Car E7	Paint Walls & Frames	G-1	4	Girote Painting	09 90 00							4										
		Sect 13	Car E7	Plumbing Valve Tag & Stencil		1	H&H-Plumbing	—							2										
		Sect 13	Car E8	Devicing & Testing		2	Staff Electric									2									
		Sect 13	Car E8	HVAC Pipe Testing		1	H&H-HVAC	CV 23 82 00								1									
		Sect 13	Car E9	HVAC Pipe Stencil & Valve Tagging		1	H&H-HVAC	CV 23 82 00									1								
		Sect 13	Car E9	Above Ceiling Inspection Prior to Grid		0	DHS	—									0								
		Sect 13	Car E10	Ceiling Grid	CC-1	4	Central Ceilings	09 60 00										4							
		Sect 13	Car E11	Lighting Fixtures	P-8	4	Pieper Electric	CV 26 61 13											4						
		Sect 13	Car E11	Registers, Grills & Diffusers		2	H&H-HVAC	CV 23 37 13											2						
		Sect 13	Car E11	Fire Protection Heads - Center of Tile		2	EGI Mechanical	CV 21 10 00											2						
		Sect 13	Car E11	Fixed Base Cabinets		4	Roadrunner												4						
		Sect 13	Car E12	Plumbing Fixtures & Ceiling Sevice Panel		2	H&H-Plumbing	CV 22 42 00												2					
		Sect 13	Car E12	Electrical to Ceiling Service Panel	P-8	2	Pieper Electric	CV 26 61 13												2					
		Sect 13	Car E12	Voice/Data to Ceiling Service Panel		2	Staff Electric													2					
		Sect 13	Car E12	Registers, Grills & Diffusers		2	H&H-HVAC	CV 23 37 13												2					
		Sect 13	Car E13	Floor Prep		4	Halverson	09 65 00													4				
		Sect 13	Car E14	VCT		4	Halverson	09 65 00														4			
		Sect 13	Car E15	VCT Wax in Wet Lab		4	Halverson	09 65 00															4		
		Sect 13	Car E16	Moveable Casework (1 of 2)		8	Roadrunner																	8	
		Sect 13	Car E17	Moveable Casework (2 of 2)		8	Roadrunner																		8
		Sect 13	Car E17	Lab Equipment		0	Various																		0
		Sect 13	Car E18	Doors & Hardware		4	JCP	08 07 00																	
		Sect 13	Car E18	Above Ceiling Inspection Prior to Closure		0	DHS	—																	
		Sect 13	Car E19	Ceiling Tile	CC-1	3	Central Ceilings	09 60 00																	
		Sect 13	Car E19	Moveable Casework - Shelving		3	Roadrunner																		
		Sect 13	Car E20	Floor Prep, Carpet & Carpet Base		4	Halverson	09 65 00																	
		Sect 13	Car E21	Final Clean		0	TBD	09 65 00																	

Using Takt Planning

- Defining the Sectors & Flow of Construction



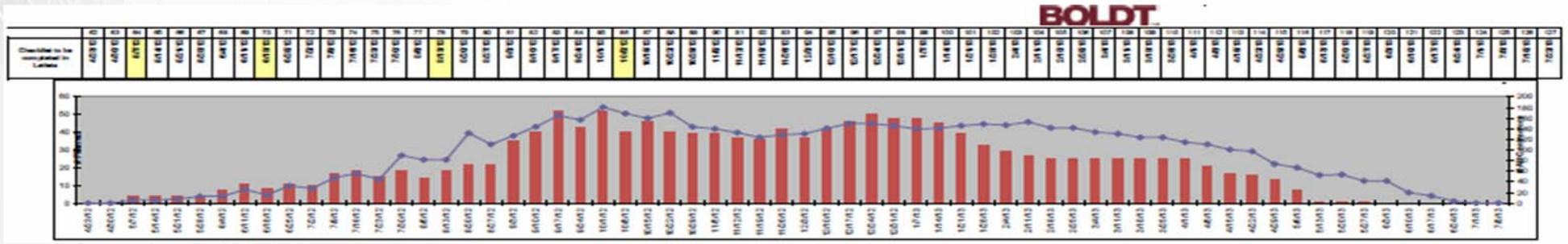
Production Strategy

- Takt Planning – Pass #2
- Finding & Closing Gaps

Using Takt Planning

- Reviewing Flow of Workforce

Workers for Subcontractor



Workers on Site

Time Scale – Week #

Implementing Takt Planning

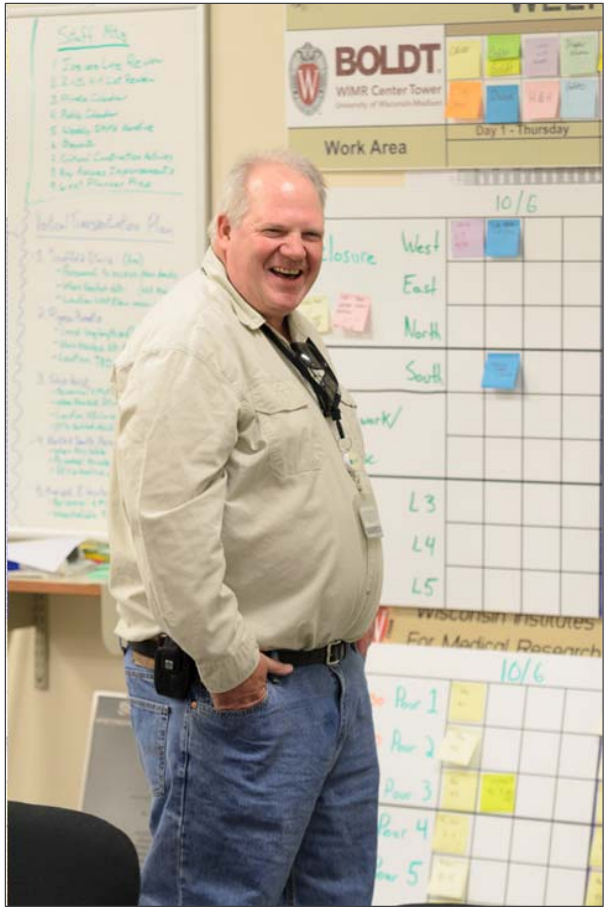
"*Another great plan by a manager that I have to implement*..."

Dan Wagner

Superintendent

A View from the Conductor's Chair

- A Better Way Needed
- Stress
- Sustainable
- Confidence
- FUN!



Lean Tools

- A Layering Process
- Establish Flow
- Level Workforce
- Making It Happen

Visual Work Space

Summary

- Collaborative Culture
- Expectation Management
- Predictable Outcomes
- Sustainable Process

- Thank you

Integration of Lean Tools & Takt Planning

2012 LCI National Conference – Arlington, VA

Presented by: John Huggett, Dan Wagner & Paul Christensen

This concludes The American Institute of Architects
Continuing Education Systems Course

Lean Construction Institute  info@leanconstruction.org