

23RD ANNUAL



23RD LCI CONGRESS
OCTOBER 19-22

A Tale of Two Schedules: LPS & the Matrix

Kent Hedges, Medxcel
Jack Cotton, The Beck Group
Jeremy Vorce, Lott Brothers Construction

LEARN BY DOING FROM THOSE WHO DO

October 20, 2021

Health precautions to keep everyone as safe as possible at Congress:

- Wear masks at all times in indoor events.
- Complete your daily health screening on your phone and bring it with you when you enter the center each day.
- Practice social distancing to the extent possible. Seating at plenary sessions is being structured to help with this.
- If you feel ill at any time, please leave the conference and return to your room/consult a physician as necessary.
- Ultimately, our collective health and safety at Congress is up to all of us. Thanks for your support!



Problem Statement

- This is the story of how an owner and two general contractors came together to build a medical office building (MOB) and two parking garages for Dell Children's Medical Center in Austin, Texas. Ascension Health's planning, design, and construction team (Medxcel) partnered simultaneously with The Beck Group (Beck) to construct the core & shell and Lott Brothers (Lott) to complete the interior buildout. The Last Planner System (LPS) was utilized by both teams; however, detailed work execution plans were developed and executed very differently.

Project Information



Core & Shell Approach



Beck Team Dynamics

Field Leadership

- Jack Cotton – Sr. Superintendent
 - 1st Lean Project
- Sean Callahan – Sr. Superintendent
 - 1st Lean Project
- **Hunter Welch – Sr. Superintendent**
 - **Regional Lean Champion**

Office Leadership

- **Jared Douglas – Sr. Project Manager**
 - **Multiple Lean Projects**
- Sean Williams – Project Manager
 - 1st Lean Project
- Stephan Mery – Project Manager
 - 1st Lean Project
- **Felipe Hernandez – Project Manager**
 - **Corporate Lean Leader**
- Jesse Fender – Sr. Field Engineer
 - 1st Lean Project

Committed Lean Tools

- Big Room
- Last Planner System
- Scrum / Agile

Big Room

[illegible]

Scrum / Agile

Sources

LABELS

- Felipe Hernandez
- Sean Williams
- Hunter Welch
- Jesse Fender
- Jack Cotton
- Shawn Callahan
- Bob Clopper
- Stephen Mery
- Jonathan Paisley
- Josh Morris

Backlog (Brain dump)

- Jerad Douglas**
Review Garage and MOB KPI Sheets
1/2
- Jerad Douglas**
Review March Financials
0/10
- Sean Williams**
SEC 48hr notice

Waiting (Constraints)

- Jesse Fender** **Jack Cotton**
Shawn Callahan
Schedule CA to cut/ patch asphalt
2
- Sean Williams** **Jack Cotton**
Ascension Setup Network Service Plan for G2 EV stations
2
- Sean Williams**
172701 Purchase Order Correction.
1
- Hunter Welch**
Beldon to install downspouts for the Avadek canopies on the MOB & Garage.
- Hunter Welch**
TDH to replace door 32075
- Hunter Welch**
TDH to replace hinge on roof door with specified hinge.
- Hunter Welch**
Beldon to install coping cap on the roof.
- Jesse Fender**
Restripe front entry of hospital
- Hunter Welch** **Jesse Fender**
Need warrantv walk for TPO roof

To Do (Weekly Work Plan)

- Jesse Fender**
FU with CA on Mueller Bus Stop Work
1
- Jesse Fender**
All MOB and G2 Remaining Punch List
- Jesse Fender**
Close out docs for TDI, Beldon, and Schmidt
- Shawn Callahan**
JE North east corner excavations.
SC
- Jesse Fender** **Shawn Callahan**
Keystone walk G2 for sawcut issue in topping slab
- Shawn Callahan**
Redwood at Imaging (Keystone) needs to be cut down for Chamberlin to Calk.
- Sean Williams** **Shawn Callahan**
Schedule Garage data drop electrical room
- Sean Williams** **Shawn Callahan**
Schedule MOB data drop L1 west electrical room.
- Sean Williams** **Jack Cotton**

Doing (Today)

- Jesse Fender** **Shawn Callahan**
Garage Punch list walk for Schmidt
- Jesse Fender** **Jack Cotton**
Shawn Callahan
Move all Schmidt stuff out of storage room in G2 and put attic stock in there. Let Douglas know when it's done.
Aug 12
- Jesse Fender** **Jack Cotton**
Shawn Callahan
Outstanding Items for our guys to do at the pavilion
1/3
- Jesse Fender** **Jack Cotton**
Shawn Callahan
complete canopy at imaging
1
- Felipe Hernandez** **Shawn Callahan**
Final SEC work
5
- Shawn Callahan**
Complete Garage Lightning Protection
2
- Jack Cotton** **Shawn Callahan**
Adhesive stain in front of Garage elevator Lvl 6

Zero Hour Responsibilities

- Felipe Hernandez** **Sean Williams**
Hunter Welch **Jesse Fender**
Jack Cotton **Shawn Callahan**
MOB-Garage-SITE COMPLETION LOG
- Felipe Hernandez** **Sean Williams**
Hunter Welch **Jesse Fender**
Jerry Salgado **Jack Cotton**
Shawn Callahan
ITEMS FOR CO
11/14
- Sean Williams** **Jack Cotton**
Shawn Callahan
Beldon - Roof patches, Pads, warranty work
Aug 13 2
- Sean Williams** **Jesse Fender**
Jack Cotton **Shawn Callahan**
Cleanscapes Bike racks ordered?
3
- Jesse Fender**
Final SSI Walk Scheduled for 8/17

Done

- Sean Williams**
Issue SCOs for Data Drops for Acuity Controllers
- Jack Cotton**
Keystone Punch sign-off
1
- Jack Cotton**
EV Chargers. Status?
1
- Sean Williams** **Shawn Callahan**
Garage 2 card reader
2
- Jesse Fender** **Shawn Callahan**
RPZ Enclosure Replacement
- Jesse Fender**
Precon with COA SSI for Bus Stop
2

Scrum / Agile

Training

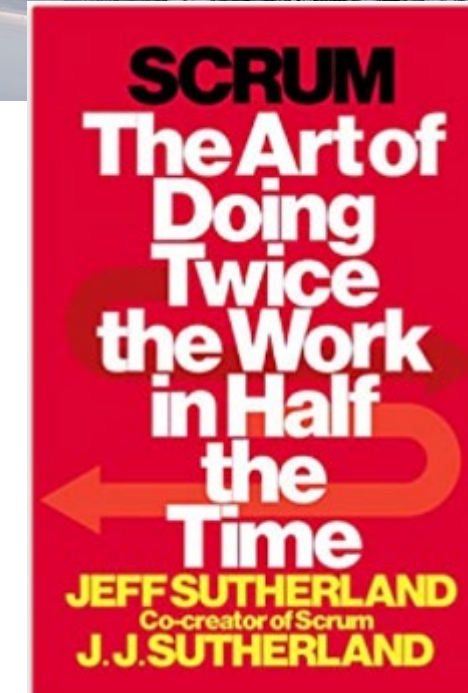
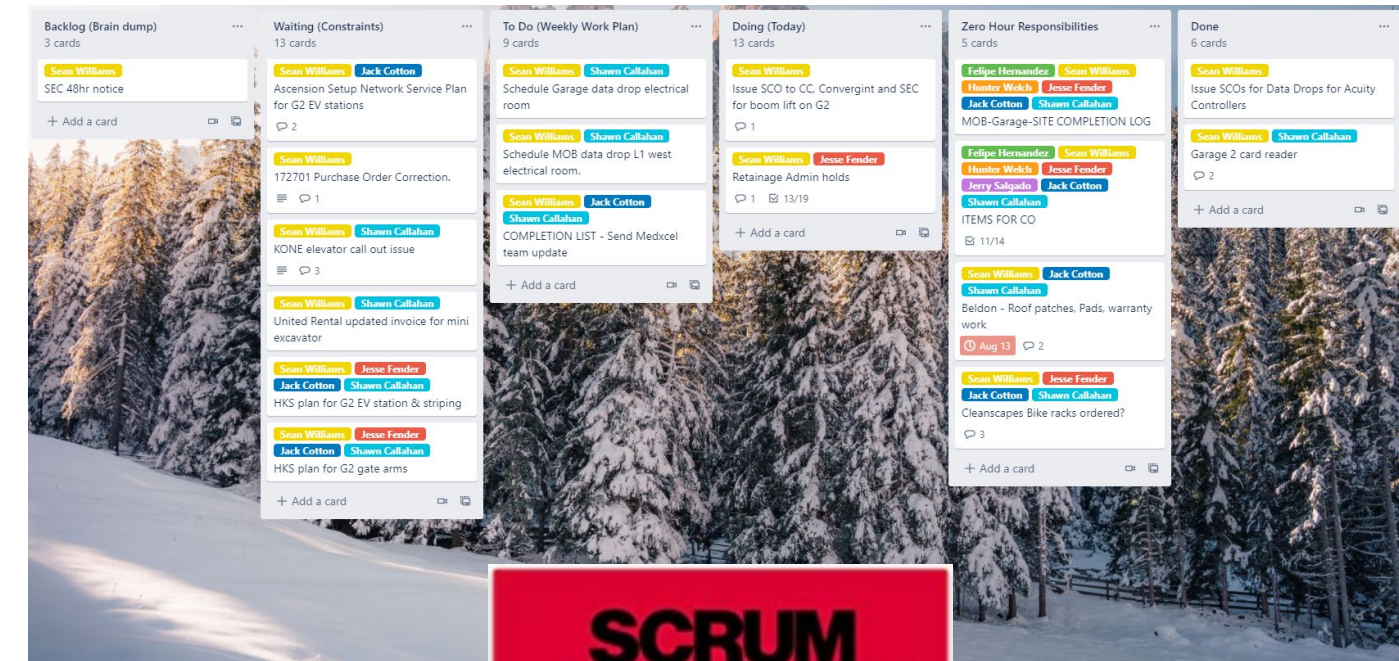
- Ready, Set, Go Scrum – July 2020
 - Felipe Engineer-Manriquez
- *Scrum: The Art of Doing Twice the Work in Half the Time*
 - Jeff Sutherland & J.J. Sutherland

Tool

- Trello: Web-based tool

Implementation

- Staff Daily Huddles – 8:00 am M-F
 - 15 – 30 Min Mtgs & Elmo Free Mondays
- Rotating Hosts, All Team Members to Populate Their Cards



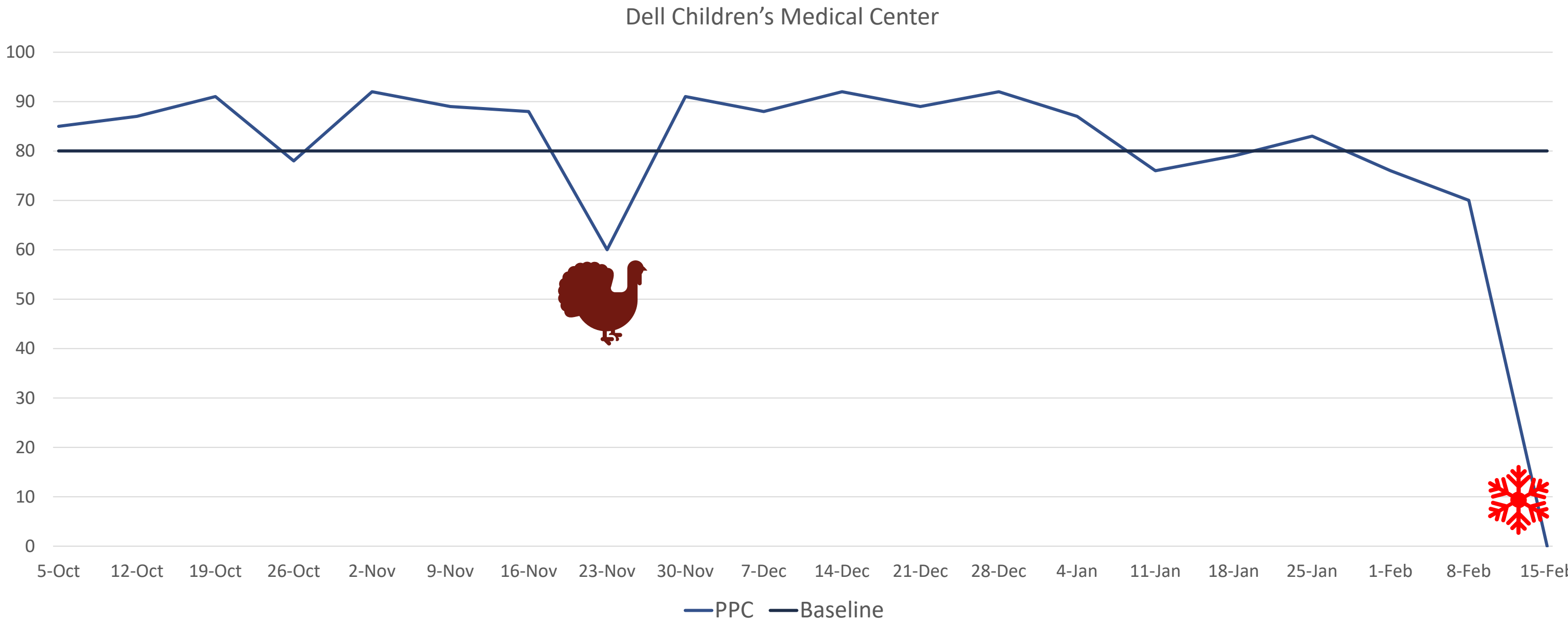
Last Planner System – Continuous Improvement

Area of Improvement

Changes Made

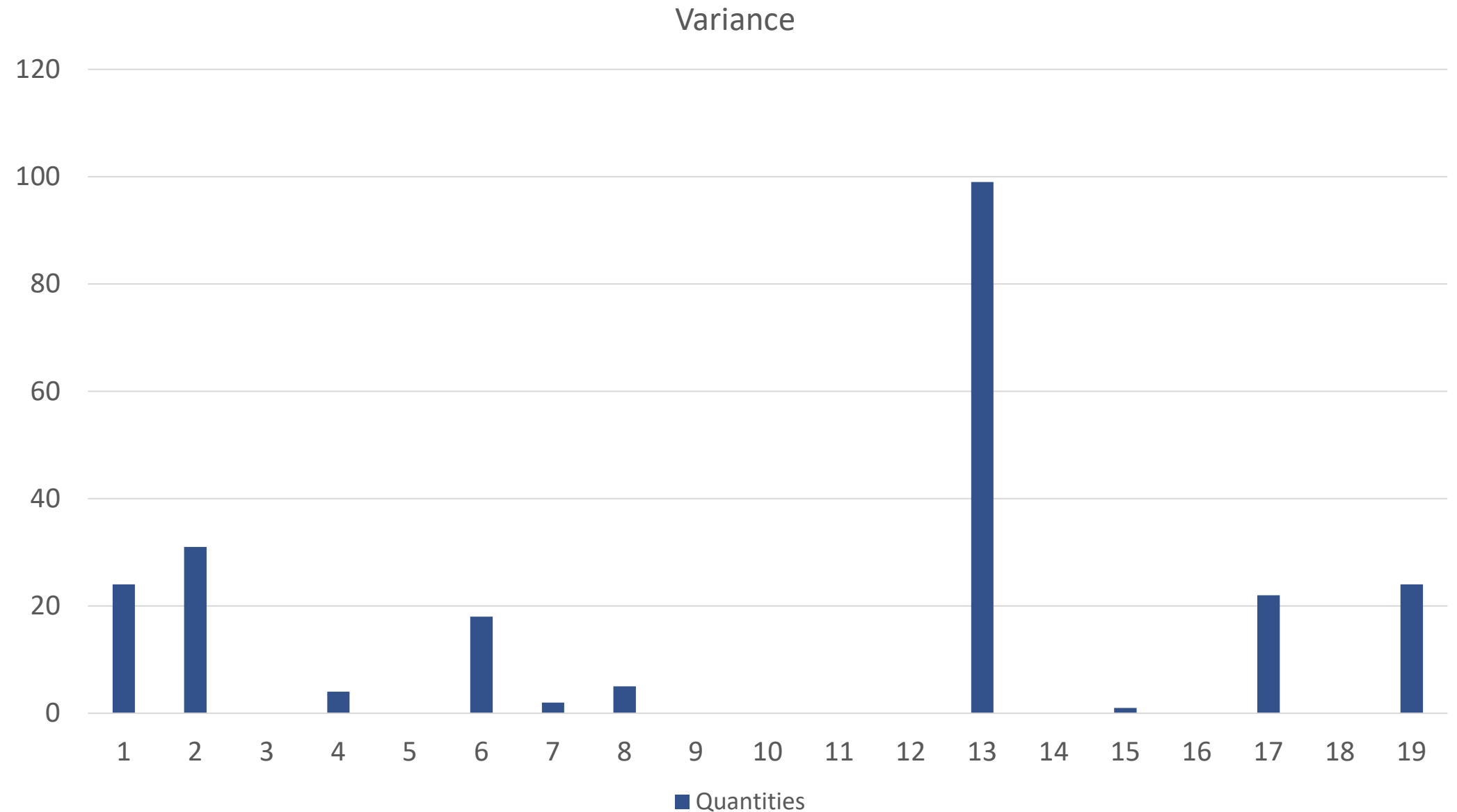
Beck Team Unfamiliar with LPS	→	Beck LPS Training, <i>The Lean Builder</i> , LCI Trainings
Trade Partners Unfamiliar with LPS	→	LCI Trainings, Owner Inspired Involvement
Performing Phase Pulls with Covid Restrictions	→	Zoom Phase Pulls & Multiple Meeting Rooms
Multiple Phase Pulls Performed Very Early	→	Revisit Phase Pulls
Unpopulated 6-Week Boards	→	Hosted 6-Week Board Population Mtgs <u>WITH FOOD</u>
Constraint Log Not Fully Utilized	→	Encouraged Trades to Populate Constraint Board
TI Milestones Not Incorporated Into Schedule	→	Lott Populated Milestones on Beck 6-Week Boards
Hosting Daily Huddles with Covid Restrictions	→	Relocated Daily Huddles Outside

Last Planner System – PPC Stats

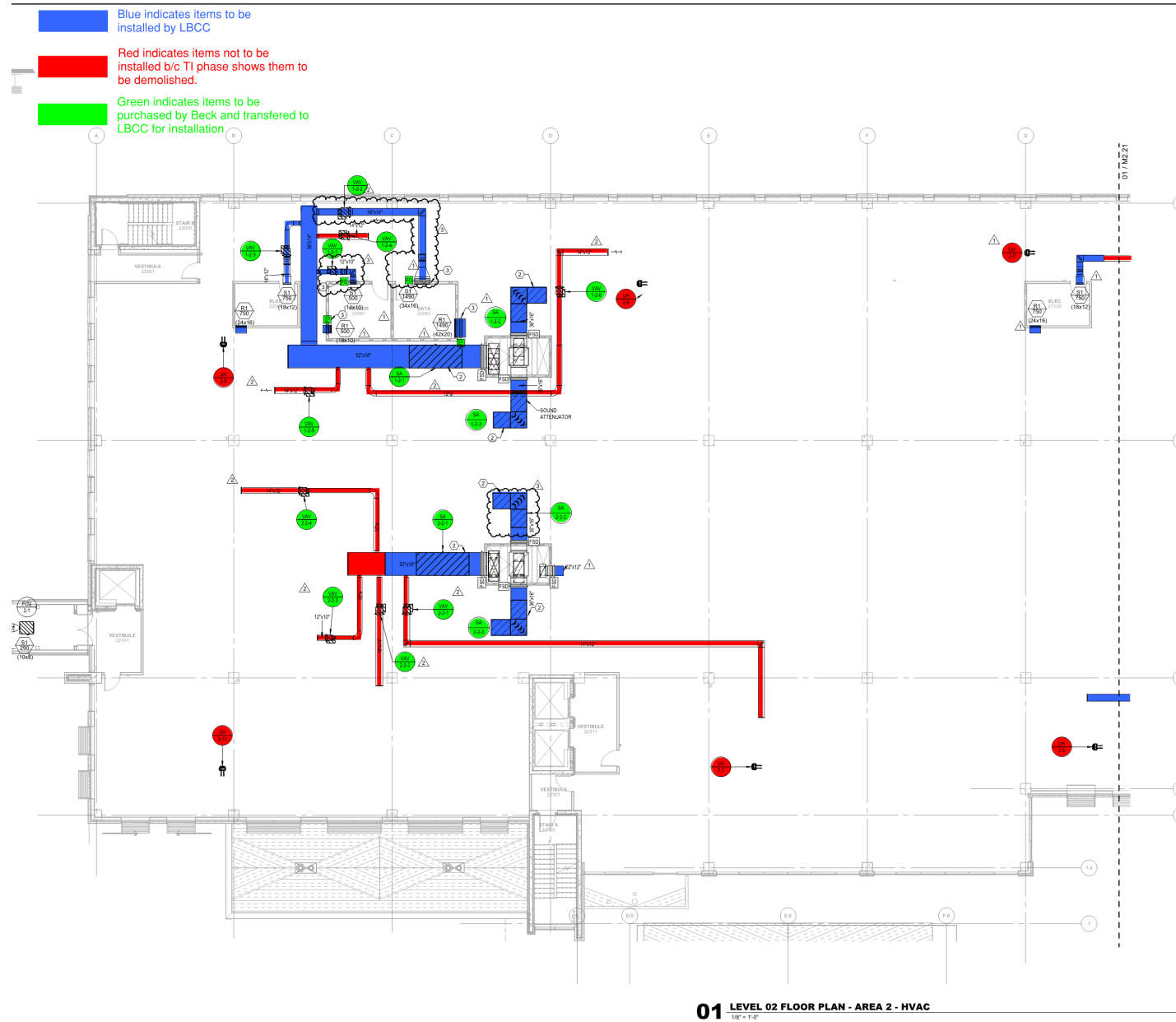


Last Planner System – PPC Stats

- 1 – Inaccurate Planning
- 2 – Prerequisite Work
- 3 – Owner Changes
- 4 – Design Matter
- 5 – Failed or No Inspection
- 6 – Labor Not Available
- 7 – Material Not Available
- 8 – Equipment Not Available
- 9 – Contracts
- 10 – Change Order
- 11 – Request For Information
- 12 – Submittals
- 13 – Weather**
- 14 – I Forgot
- 15 – Unforeseen Conditions
- 16 – Value Engineering Delay
- 17 – Longer Than Anticipated
- 18 – No Access
- 19 – Other Priority Work



Scope Realignment Coordination

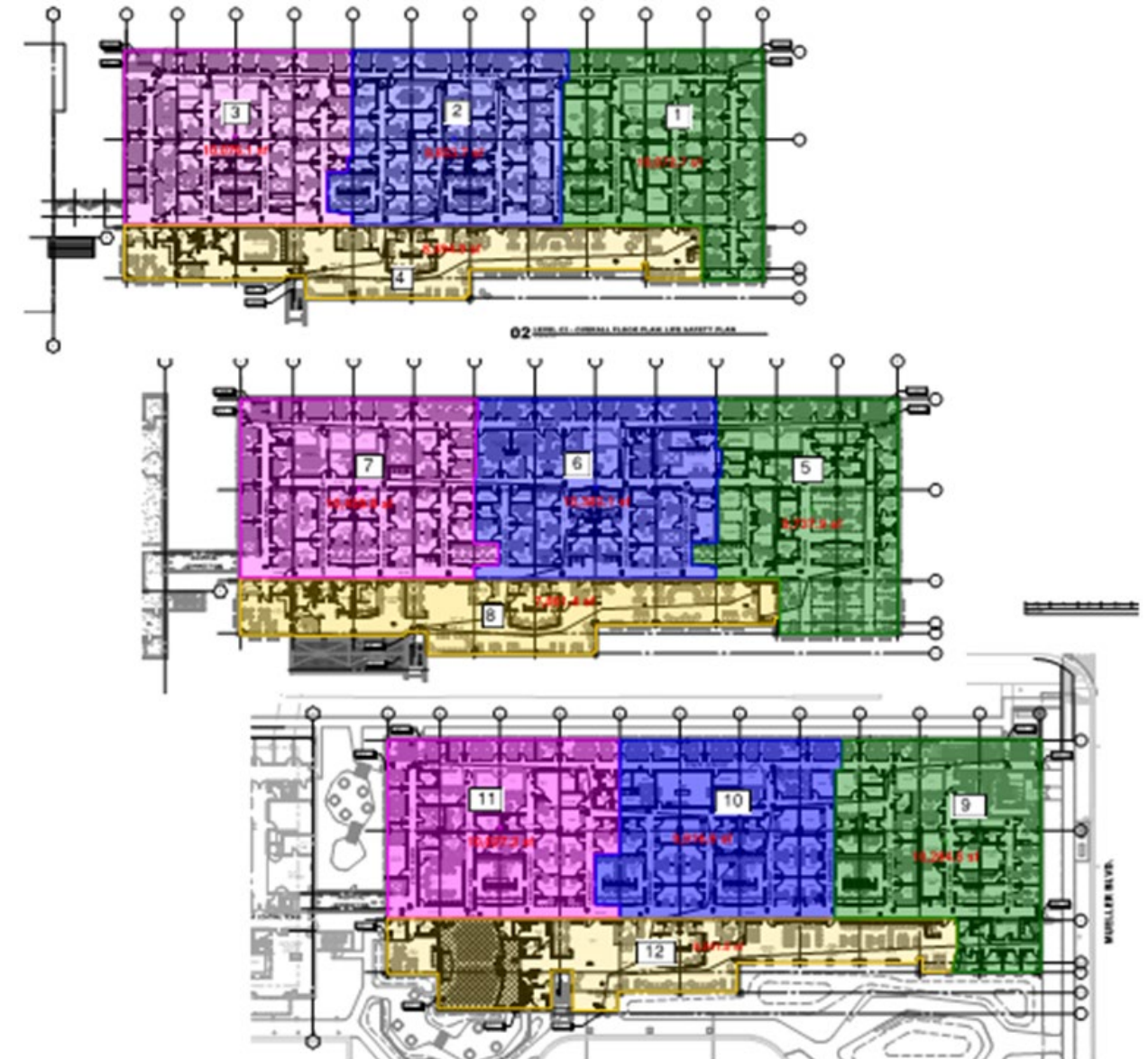


Tenant Improvement Approach

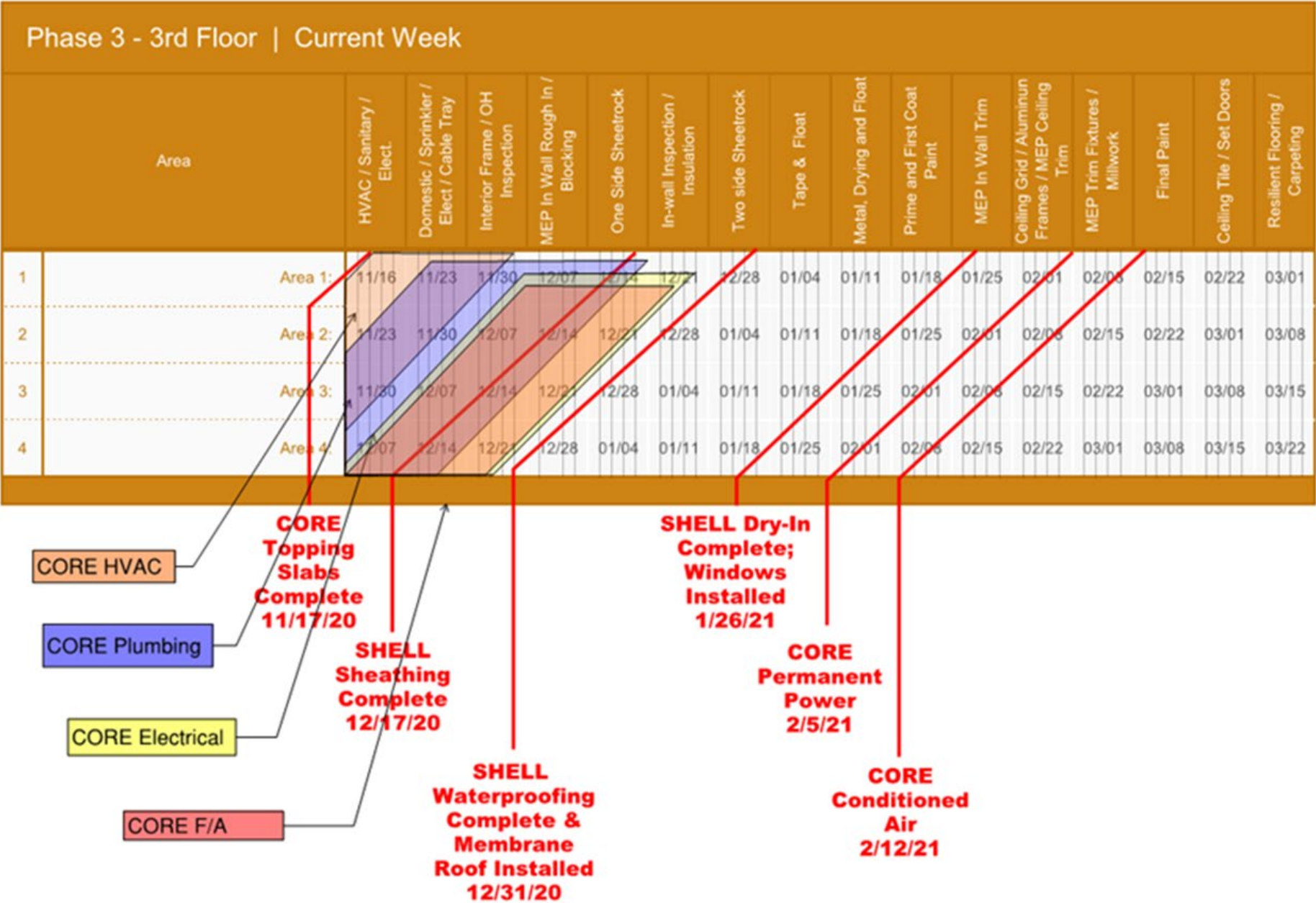


Production & Process Efficiency

- Concurrent construction on all floors
 - 4 Areas per floor:
 - Each approximately 10,000 sf
- Workflow:
 - East to West (same as Core & Shell)



Schedule Integration



Clear Flow Matrix[®]

Pacemaker Activities = Area Handoffs = Process Efficiency

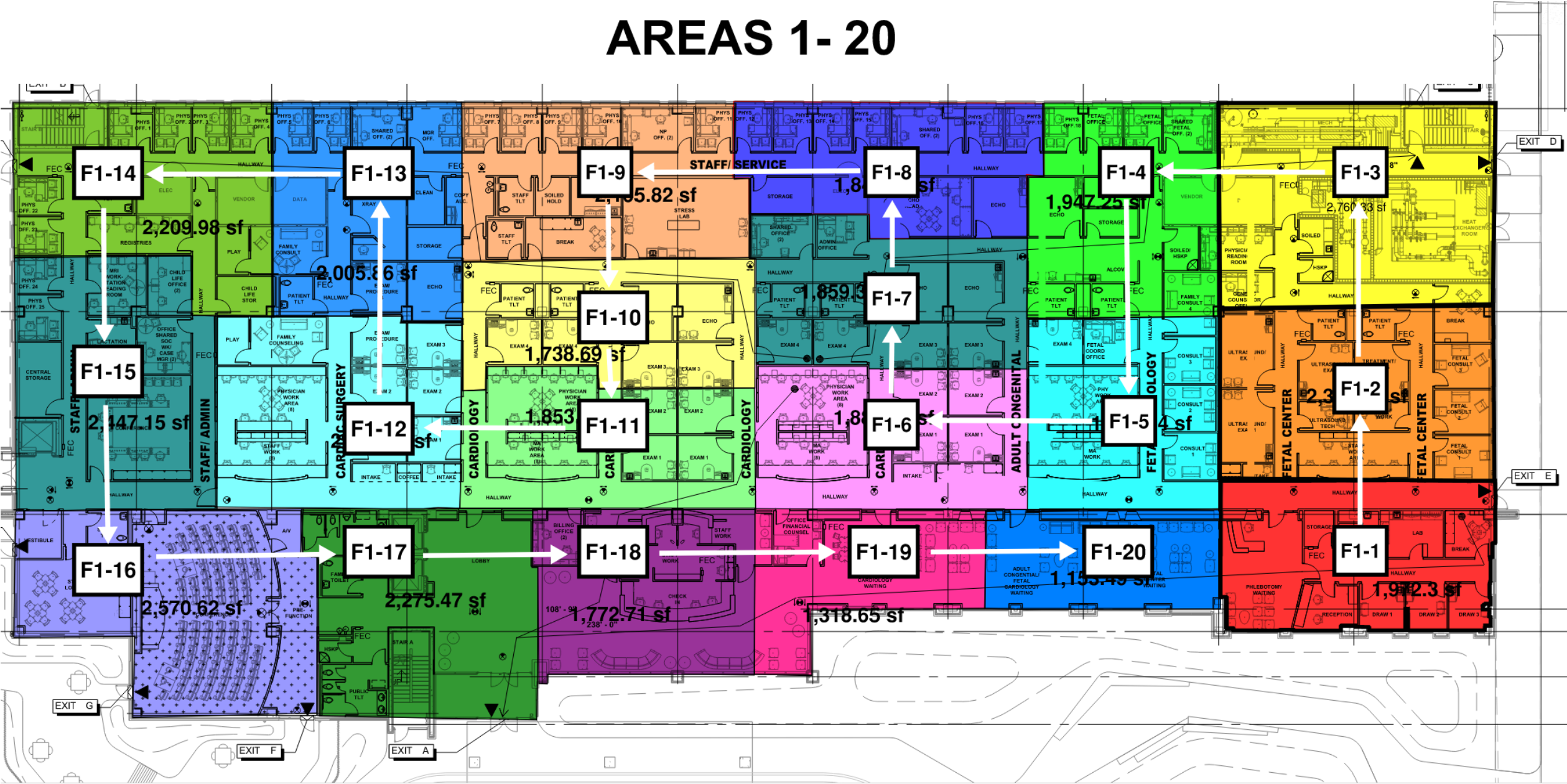
Production = Operational Efficiency

Dell Children's MOB TI Phase 1 - ALL FLOORS Current Week																					
Area		Layout & Coring	Sanitary & Electrical & Sprinkler Mains	Mechanical & Domestic	Sprinkler	Interior Frame / OH Inspection / Fur Downs	MEP in Wall rough In / Blocking	One Side Sheetrock	In-wall Inspection / Insulation / Install Windows	Two Side Sheetrock	Tape & Float	Prime & First Coat Paint / Cable Tray	Install Low Voltage Cabling	Ceiling Grid / Aluminum Frames	MEP Ceiling Trim	Millwork / Bathroom Floors	MEP Trim Fixtures / Above Ceiling Inspections	Ceiling Tile / Set Doors	Final Paint	Resilient Flooring / Carpeting / Door Trim	Inspections / Punch / Clean
1	Area 1 (Zones 1-5):	10/05	10/12	10/19	10/26	11/02	11/09	11/16	11/23	11/30	12/07	12/14	12/21	12/28	01/04	01/11	01/18	01/25	02/01	02/08	02/15
2	Area 2 (Zones 6-10):	10/12	10/19	10/26	11/02	11/09	11/16	11/23	11/30	12/07	12/14	12/21	12/28	01/04	01/11	01/18	01/25	02/01	02/08	02/15	02/22
3	Area 3 (Zones 11-15):	10/19	10/26	11/02	11/09	11/16	11/23	11/30	12/07	12/14	12/21	12/28	01/04	01/11	01/18	01/25	02/01	02/08	02/15	02/22	03/01
4	Area 4 (Zones 16-20):	10/26	11/02	11/09	11/16	11/23	11/30	12/07	12/14	12/21	12/28	01/04	01/11	01/18	01/25	02/01	02/08	02/15	02/22	03/01	03/08

Balanced Production Front

Daily Takt Zones

AREAS 1- 20



Daily Status in Matrix Format

<div>LOTT BROTHERS CONSTRUCTION COMPANY</div>																					
Project# DCMC PACE MOB	1. Coordination.	5. Prerequisite Work.					9.Submittals					13. Space.									
Contractor: Capstar Electrical	2. Engineering.	6. Labor.					10. Approvals.					14. Site Conditions.									
Superintendent: Bill & Joe	3. Owner Decision.	7.Materials.					11. Equipment.					15. Inspections.									
Required Manpower:	4. Weather.	8.Contracts/CO					12.RFI's.					16. Work Stoppage.									
DESCRIPTION OF WORK	Week 1					Week 2					Week 3					Week 4					
	F3-1	F3-2	F3-3	F3-4	F3-5	F3-6	F3-7	F3-8	F3-9	F3-10	F3-11	F3-12	F3-13	F3-14	F3-15	F3-16	F3-17	F3-18	F3-19	F3-20	
Install Above Ceiling Lights	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Above Ceiling Lights Connected To Permanent Power	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Lighting Sensors	D	D	D	D	D	D	D	D	D	D	D	D	IP	IP	IP						
Install Devices: Switches & Outlets	D	D	D	D	D	D	D	D	D	D	D	D	D	IP	IP						
COA Above Ceiling Inspections	D	D	D	D	D	D	D	D	D	D	IP	IP	IP	IP	IP						
Trouble Shooting	D	D	D	D	D	D	D	D	D	D	IP	IP									
Punch																					
COA Electrical Inspection Flow Chart																					

Weekly Work Plan



CFMx Weekly Work Plan



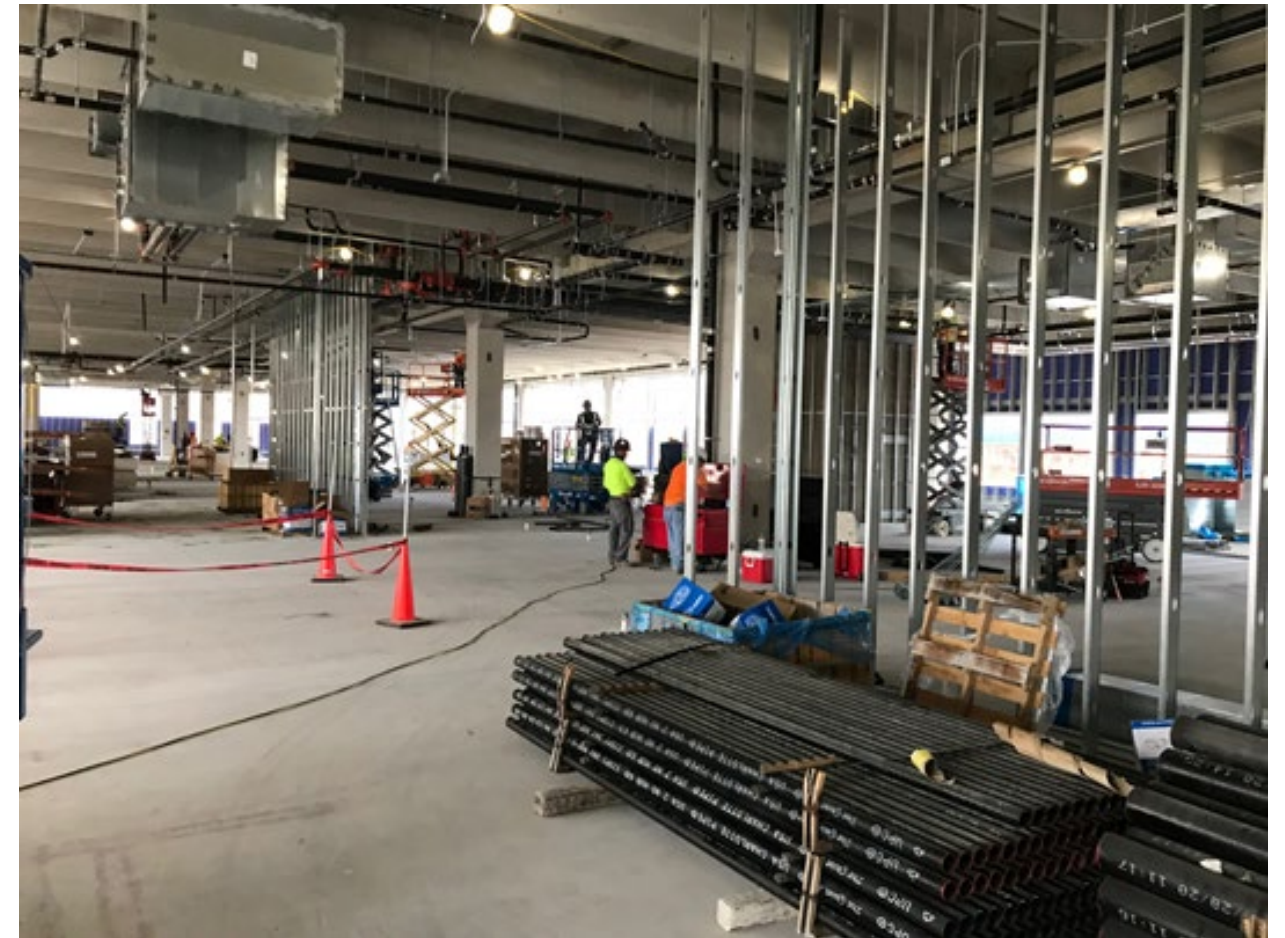
DCMC PACE MOB			CATEGORIES OF PLAN FAILURE								Total Activities	Completed	Incomplete	Plan Failure
AUSTIN,TX			1. Coordination		5. Prerequisite Work		9. Submittals		13. Space					
Contractor:		LBCC	2. Eng./Design		6. Labor		10. Approvals		14. Site Conditions					
Supervisor:		JV, HP, JR,& SS	3. Owner Decision		7. Materials		11. Equipment		15. Inspections					
Manpower Total:		100	4. Weather		8. Contracts/COs		12. RFI's		16. Work Stoppage					
AREA	Manpower	DESCRIPTION OF WORK	Week 3	Mon	Tue	Wed	Thur	Fri	Sat	15	60.0%	40.0%	6	
				10/19	10/20	10/21	10/22	10/23	10/24					
F3	10	3G Drywall 3rd Floor - Is Hand off completed for week 4 11/2 ?						X		1	X		86%	
F2	8	Live Oak Construction 2nd Floor. Is the Handoff completed for week 4 11/2?						X		2	X		80%	
F1	8	TCM Enterprises 1st Floor. Is the Handoff completed for week 4 11/2 ?						X		3	X		71%	
F3	34	Capstar Electrical - 3rd Floor WWP completed?						X		4	X		100%	
F2		Capstar Electrical - 2nd Floor WWP completed?						X		5	X		100%	
F1		Capstar Electrical - 1st Floor WWP completed?						X		6	X		100%	
F3	20	MC Systems - 3rd Floor WWP completed?						X		7		X	60%	
F2		MC Systems- 2nd Floor WWP completed?						X		8		X	60%	
F1		MC Systems - 1st Floor WWP completed?						X		9		X	60%	
F3	14	Stamport Plumbing 3rd Floor WWP completed?						X		10		X	50%	
F2		Stamport Plumbing 2nd Floor WWP completed?						X		11		X	50%	
F1		Stamport Plumbing 1st Floor WWP completed?						X		12		X	50%	
F3	6	Vanguard Fire Sprinkler 3rd Floor WWK completed?						X		13	X		68%	
F2	100	Vanguard Fire Sprinkler 2nd Floor WWK completed?						X		14	X		68%	
F1		Vanguard Fire Sprinkler 1st Floor WWK completed?						X		15	X		68%	

Work Sequencing

- Overhead MEP completed before framing started

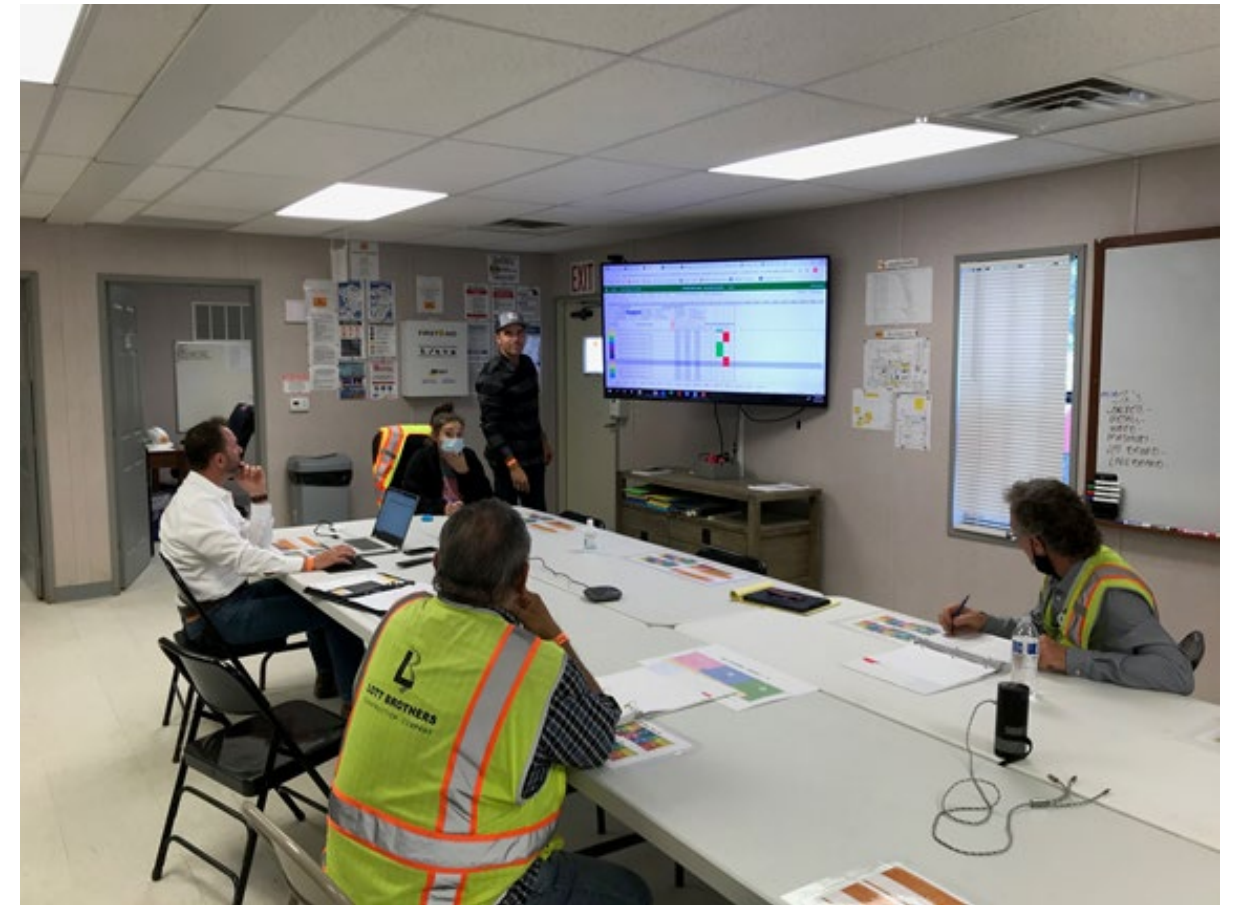


- Framing begins by area only, not the entire floor



Daily Coordination Meetings

- Site Supervisor meeting each morning
- Lott progress review each afternoon



Daily Delivery Schedule

DCMC PACE MOB DELIVERY SCHEDULE

Month:	October																																					
Day:	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo								
Date:	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2								
5:00AM-6:00AM		16	16	16	16	16			16	16	16	16	16			16	16	16	16	16			16	16	16	16	16											
6:00AM-7:00AM		16	16	16	16	16			16	16	16	16	16			16	16	16	16	16			16	16	16	16	16											
7:00AM-8:00AM		19	19	19	19	19			19	19	19	19	19			19	19	19	19	19			19	19	19	19	19											
8:00AM-9:00AM		19	19	19	19	19			19	19	19	19	19			19	19	19	19	19			19	19	19	19	19											
9:00AM-10:00AM					17	7			18		21	17				18		21	17				18	7	21	17												
10:00AM-11:00AM					17	7			18		21	17				18		21	17				18	7	21	17												
11:00AM-12:00PM				5		6			18	6	5		6			18	6	5		6			18	6	5		6											
12:00PM-1:00PM				5		6			18	6	5		6			18	6	5		6			18	6	5		6											
1:00PM-2:00PM						7			7	7	7	7	7			7	7	7	7	7			7	7	7	7	7											
2:00PM-3:00PM						6			6	6	6	6	6			6	6	6	6	6			6	6	6	6	6											
3:00PM-4:00PM						5			5	5	5	5	5			5	5	5	5	5			5	5	5	5	5											
4:00PM-5:00PM									18	18	18	18	18			18	18	18	18	18			18	18	18	18	18											
Month:	November																																					
Day:	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo								
Date:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
5:00AM-6:00AM		16	16	16	16	16			16	16	16	16	16			16	16	16	16	16																		
6:00AM-7:00AM		16	16	16	16	16			16	16	16	16	16			16	16	16	16	16																		
7:00AM-8:00AM		19	19	19	19	19			19	19	19	19	19			19	19	19	19	14							14											
8:00AM-9:00AM		19	19	19	19	19			19	19	19	19	19			19	19	19	19	14							14											
9:00AM-10:00AM		18	7	21	17	12			18	7	21	17	12			18	7			12			18	7			12											
10:00AM-11:00AM		18	7	21	17	12			18	7	21	17	12			18	7			12			18	7			12											
11:00AM-12:00PM			6	5		6				6	5		6			15	6	5		6			15	6	5		6											
12:00PM-1:00PM			6	5		6				6	5		6			15	6	5		6			15	6	5		6											
1:00PM-2:00PM		7	7	7	7	7			7	7	7	7	7			7	7	7	7	7			7	7	7	7	7											
2:00PM-3:00PM		6	6	6	6	6			6	6	6	6	6			6	6	6	6	6			6	6	6	6	6											
3:00PM-4:00PM		5	5	5	5	5			5	5	5	5	5			5	5	5	5	5			5	5	5	5	5											
4:00PM-5:00PM		18	18	18	18	18			18	18	18	18	18			18	18	18	18	18																		
5:00PM-6:00PM																																						
Contractor Identification Legend																																						
1	Titan Metals/ Metals							6	Live Oak Const/2nd Framing							11	Painting/3rd Austin Coatings							16	Fire Sprinkler/Vanguard Fire							21	Cable Comm					
2	EGR Milwork/Milwork							7	3G Drywall/3rd Framing							12	Partions/ Hufcor							17	Plumbing/Stamport													
3	La Force/Doors &Hardware							8	GFCs/Resillient Flooring							13	Wall Protection/Spectrum							18	Mechanical/MC Systems													
4	Anchor Ventana/Storefronts							9	Painting/1st Cherry Coatings							14	Equipment Supports/Unistut Cor							19	Electrical/Capstar													
5	TCM Enterprises/ 1st Framing							10	Painting/2nd CTDecorating							15	Window Treatments/ J.C.Mower							20	Fire Alarm/Siemens Industry													



Lessons Learned



Lessons Learned – How to apply tomorrow?

- Coordination between two General Contractor Superintendents
- Onboarding was critical to maintain culture
- Initial pushback & experience with LPS/Matrix planning (what changed your mind)
- Schedule (mis)alignment → trust grew as the project progressed
- Clear understanding & maintenance of work flow
- Peer-to-peer conflict resolution
- Site logistics (loading zone)
- Plan, plan, plan...then MUST match the field
- Don't be afraid to try but commit to the direction and stay the course

Q & A



23RD LCI CONGRESS
OCTOBER 19-22



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.

Contact Us

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Thank you for attending this presentation. Enjoy the rest of the 23rd Annual LCI Congress!