

26TH ANNUAL



26TH LCI CONGRESS
OCTOBER 22-25, 2024

Intro to the Last Planner System®: Builder's Edition

Keyan Zandy, CEO

Seth Harrison, Superintendent

Thomas Hardy, Superintendent

SURFING THE WAVE OF LEAN DESIGN AND CONSTRUCTION

OCTOBER 23, 2024



Keyan Zandy
CEO
Skiles Group



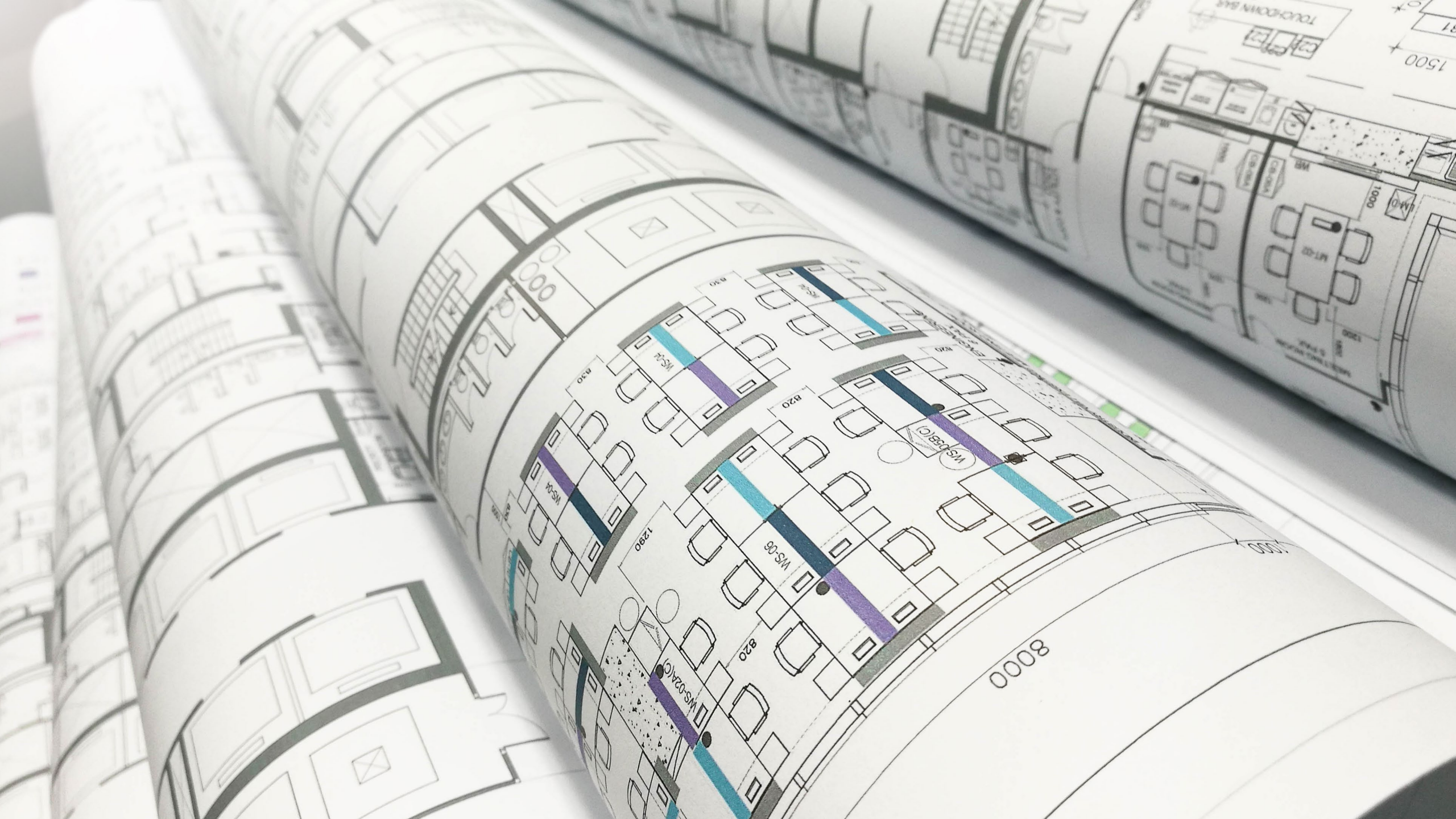
Seth Harrison
Superintendent
Skiles Group



Thomas Hardy
Superintendent
Skiles Group

WHY LEAN?



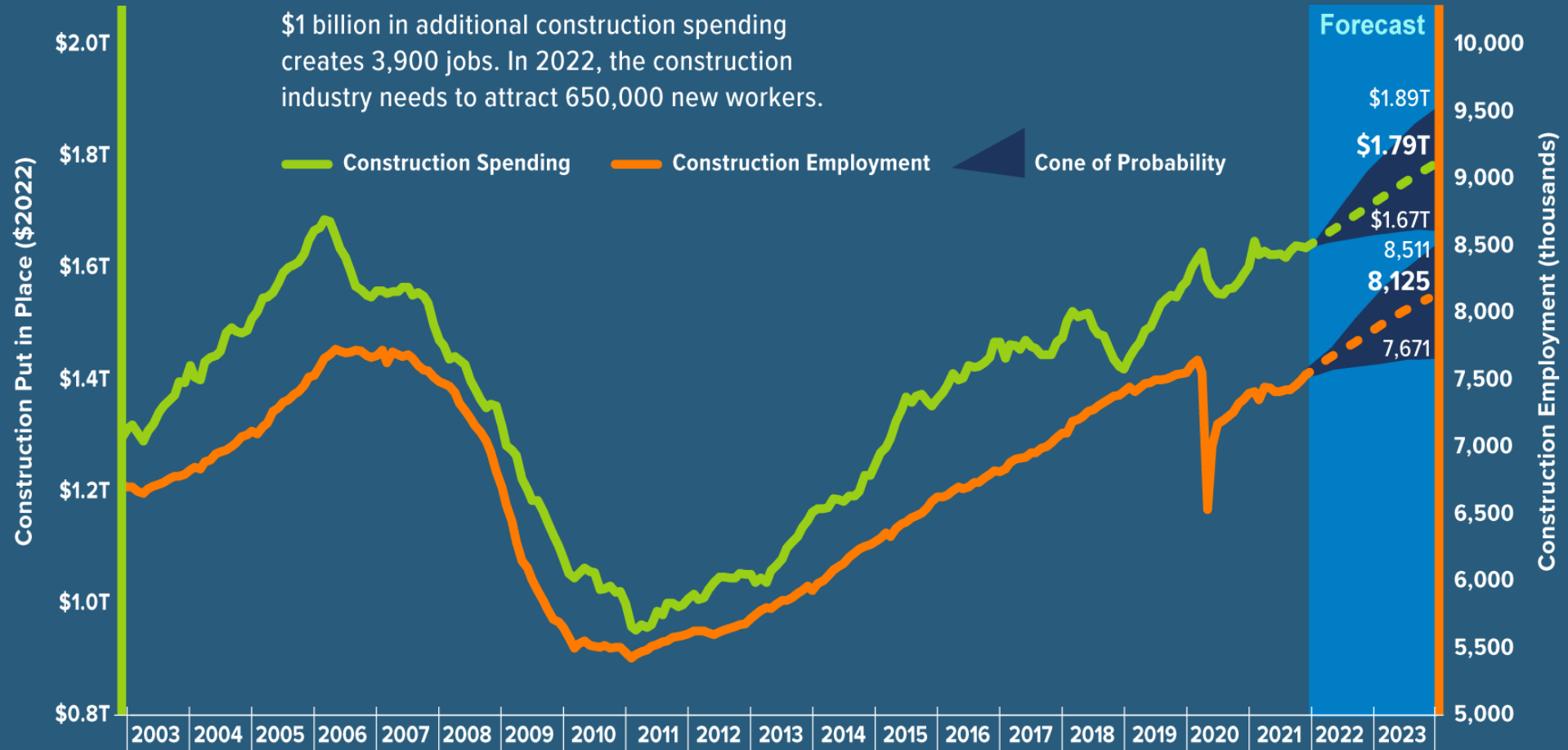






Construction Spending and Employment Forecast (High, Base, and Low Scenarios)

\$1 billion in additional construction spending creates 3,900 jobs. In 2022, the construction industry needs to attract 650,000 new workers.













YOUNG FOREVER

EXTERIOR

IF NOT NOW THEN

WALK

YAWL
WALKER

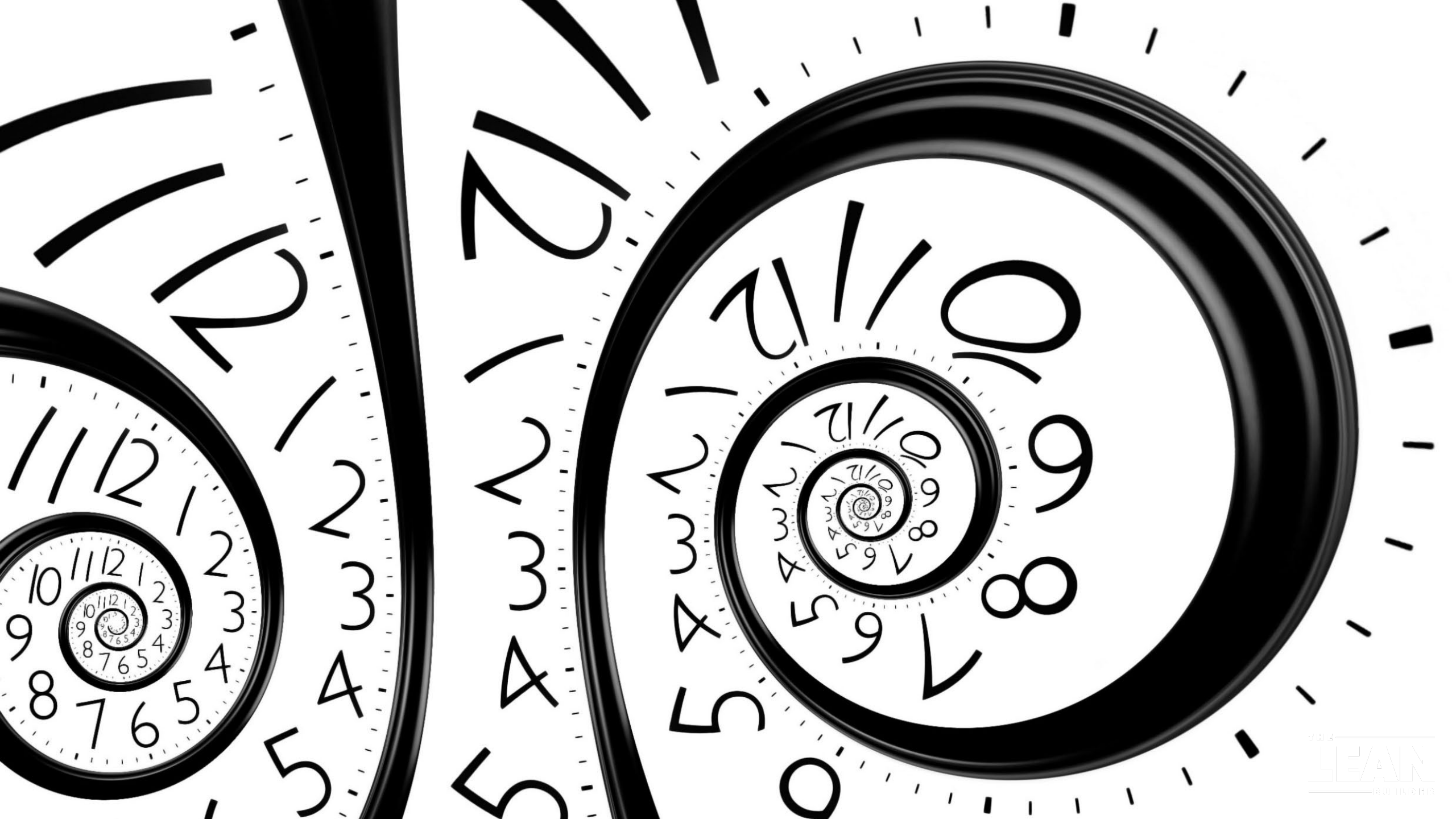
Do You Like EL OJO SAYS
FUDGE TRUMP!

WALKER

WALKER

SARIN









A FIFTH INCREASED
THEIR ALCOHOL
AND TOBACCO INTAKE
TO RELIEVE STRESS.

73%

OF RESPONDENTS FELT THEIR EMPLOYERS
DID NOT RECOGNISE THE EARLY SIGNS OF
MENTAL HEALTH PROBLEMS.

45% OF WOMEN WORKERS SAID THEIR MENTAL
HEALTH WAS AVERAGE TO POOR AT PRESENT,
COMPARED TO 32% OF MEN.

TWO THIRDS OF WORKERS SAID THERE ARE
NOT SUFFICIENT OUTLETS TO
DISCUSS THEIR MENTAL HEALTH.

3/4 OF FEMALE
WORKERS HAD
EXPERIENCED LOSS
OF SLEEP DUE TO
POOR MENTAL
HEALTH, COMPARED
WITH 65% OF MEN.

43% OF
WORKERS WANT
AN ANONYMOUS
HELPLINE.

43% OF WOMEN HAD EXPERIENCED REDUCED
PRODUCTIVITY, COMPARED WITH 38% OF MEN.

IN CONSTRUCTION MALE
WORKERS WERE 35%
MORE LIKELY TO TAKE
THEIR OWN LIVES.

THE
CONSTRUCTION
INDUSTRY IS
ONE OF THE
MOST AT-RISK
INDUSTRIES FOR
SUICIDE

23%

OF
CONSTRUCTION
WORKERS SAID
THEY WERE
CONSIDERING
EXITING THE
INDUSTRY
WITHIN THE NEXT
YEAR DUE TO
HIGH LEVELS OF

STRESS AND
CHALLENGES IN
STRIKING A WORK /
LIFE BALANCE.

RISK OF
SUICIDE

FOR THOSE WORKING IN
BUILDING AND
CONSTRUCTION
TRADES IS

1.6
TIMES
HIGHER
THAN THE
NATIONAL
AVERAGE.

TWO-THIRDS
OF ALL
SUICIDES BY
THOSE WORKING
IN CONSTRUCTION
TRADES WERE BY
THOSE
AGED 40+.

MANY
WITHIN THE
INDUSTRY
SUFFER IN
SILENCE
DUE TO
CULTURAL
EXPECTATIONS

THE CONSTRUCTION TRADE
HAS THE
HIGHEST
NUMBER
OF SUICIDES OF ANY
PROFESSION.

OVER 1,400
CONSTRUCTION
WORKERS COMMITTED
SUICIDE
BETWEEN 2011
AND 2015.

THE CONSTRUCTION
INDUSTRY EXHIBITS
MANY COMMON
RISK FACTORS
THAT ARE ASSOCIATED WITH
FEELINGS OF
HELPLESSNESS.

SUICIDE IS A TABOO
TOPIC ON THE JOBSITE.

82% OF WORKERS AGREE THAT
THERE IS A STIGMA OF MENTAL
HEALTH IN CONSTRUCTION.

ONE IN SEVEN
WORKERS HAVE KNOWN A
COLLEAGUE WHO HAS
TAKEN THEIR OWN LIFE.

WORKERS
ADMIT TO
SUFFERING
IN SILENCE.

55% OF
CONSTRUCTION
WORKERS HAD
EXPERIENCED MENTAL
HEALTH ISSUES.

1 IN 5
WORKERS FEAR THAT
DISCLOSURE COULD
COST THEM THEIR JOB.

WORKERS DO NOT TURN TO THEIR EMPLOYER DUE TO
"FEAR AND STIGMA".

ONE
IN
FIVE
CONSTRUCTION
WORKERS STRUGGLE WITH MENTAL
HEALTH ISSUES.

MORE THAN A QUARTER OF
CONSTRUCTION EMPLOYEES
HAVE CONSIDERED TAKING THEIR OWN LIFE.

83%

OF WORKERS
SAID THERE IS
NOT ENOUGH
INDUSTRY
AWARENESS
SURROUNDING
MENTAL
HEALTH.

MANY WORKERS
FEEL FORCED
TO

"DEAL
WITH
IT."

NOT SEEKING
OUT THE HELP
THEY NEED,
AND SYMPTOMS
GET WORSE.



Don't let your struggle
become your identity.



DAILY HUDDLES



WEEK LEAN DASHBOARD:
EMC (Hospitals)

5/22-6/11

OWNER TRACKING

CONSTRAINTS / NEEDS

PRELIMINARY

3 WEEK LOOK-AHEAD PLANNING

6/11 - 6/15 6/16 - 7/2 7/3 - 7/10 7/11 - 7/17 7/18 - 7/24 7/25 - 7/31 8/1 - 8/7 8/8 - 8/14 8/15 - 8/21 8/22 - 8/28 8/29 - 9/4 9/5 - 9/11 9/12 - 9/18 9/19 - 9/25 9/26 - 10/2 10/3 - 10/9 10/10 - 10/16 10/17 - 10/23 10/24 - 10/30 10/31 - 11/6 11/7 - 11/13 11/14 - 11/20 11/21 - 11/27 11/28 - 12/4 12/5 - 12/11 12/12 - 12/18 12/19 - 12/25 12/26 - 1/1 1/2 - 1/8 1/9 - 1/15 1/16 - 1/22 1/23 - 1/29 1/30 - 2/5 2/6 - 2/12 2/13 - 2/19 2/20 - 2/26 2/27 - 3/5 3/6 - 3/12 3/13 - 3/19 3/20 - 3/26 3/27 - 4/2 4/3 - 4/9 4/10 - 4/16 4/17 - 4/23 4/24 - 4/30 5/1 - 5/7 5/8 - 5/14 5/15 - 5/21 5/22 - 5/28 5/29 - 6/4 6/5 - 6/11 6/12 - 6/18 6/19 - 6/25 6/26 - 7/2 7/3 - 7/9 7/10 - 7/16 7/17 - 7/23 7/24 - 7/30 7/31 - 8/6 8/7 - 8/13 8/14 - 8/20 8/21 - 8/27 8/28 - 9/3 9/4 - 9/10 9/11 - 9/17 9/18 - 9/24 9/25 - 10/1 10/2 - 10/8 10/9 - 10/15 10/16 - 10/22 10/23 - 10/29 10/30 - 11/5 11/6 - 11/12 11/13 - 11/19 11/20 - 11/26 11/27 - 12/3 12/4 - 12/10 12/11 - 12/17 12/18 - 12/24 12/25 - 12/31

SKILES GROUP

THREE WEEK LEAN DASHBOARD:

Site & POB

LAST PLANNER TRACKING

ACTIVITY / WORK TO BE DONE

CONSTRAINTS / NEEDS

PRELIMINARY

3 WEEK LOOK-AHEAD PLANNING

6/11 - 6/15 6/16 - 7/2 7/3 - 7/10 7/11 - 7/17 7/18 - 7/24 7/25 - 7/31 8/1 - 8/7 8/8 - 8/14 8/15 - 8/21 8/22 - 8/28 8/29 - 9/4 9/5 - 9/11 9/12 - 9/18 9/19 - 9/25 9/26 - 10/2 10/3 - 10/9 10/10 - 10/16 10/17 - 10/23 10/24 - 10/30 10/31 - 11/6 11/7 - 11/13 11/14 - 11/20 11/21 - 11/27 11/28 - 12/4 12/5 - 12/11 12/12 - 12/18 12/19 - 12/25 12/26 - 1/1 1/2 - 1/8 1/9 - 1/15 1/16 - 1/22 1/23 - 1/29 1/30 - 2/5 2/6 - 2/12 2/13 - 2/19 2/20 - 2/26 2/27 - 3/5 3/6 - 3/12 3/13 - 3/19 3/20 - 3/26 3/27 - 4/2 4/3 - 4/9 4/10 - 4/16 4/17 - 4/23 4/24 - 4/30 5/1 - 5/7 5/8 - 5/14 5/15 - 5/21 5/22 - 5/28 5/29 - 6/4 6/5 - 6/11 6/12 - 6/18 6/19 - 6/25 6/26 - 7/2 7/3 - 7/9 7/10 - 7/16 7/17 - 7/23 7/24 - 7/30 7/31 - 8/6 8/7 - 8/13 8/14 - 8/20 8/21 - 8/27 8/28 - 9/3 9/4 - 9/10 9/11 - 9/17 9/18 - 9/24 9/25 - 10/1 10/2 - 10/8 10/9 - 10/15 10/16 - 10/22 10/23 - 10/29 10/30 - 11/5 11/6 - 11/12 11/13 - 11/19 11/20 - 11/26 11/27 - 12/3 12/4 - 12/10 12/11 - 12/17 12/18 - 12/24 12/25 - 12/31

Site Work Zones



Site Utilities Progress

POB Paper Doll

Site Concrete Pour Break Plan

Handwritten notes and diagrams on the wall, including a site map and a list of tasks.

1. Use first names

Guidelines for a Great Daily Huddle



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker



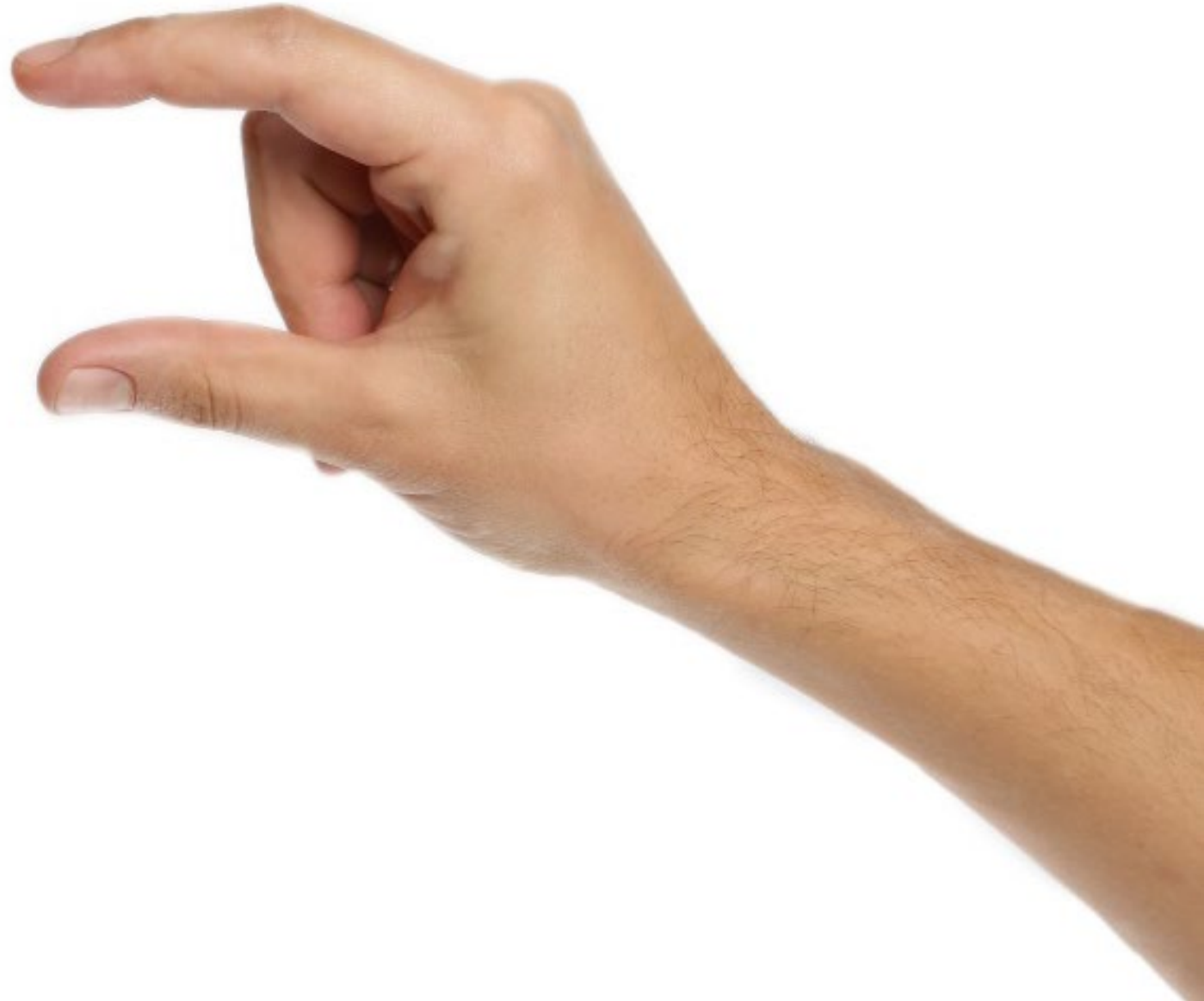
Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions



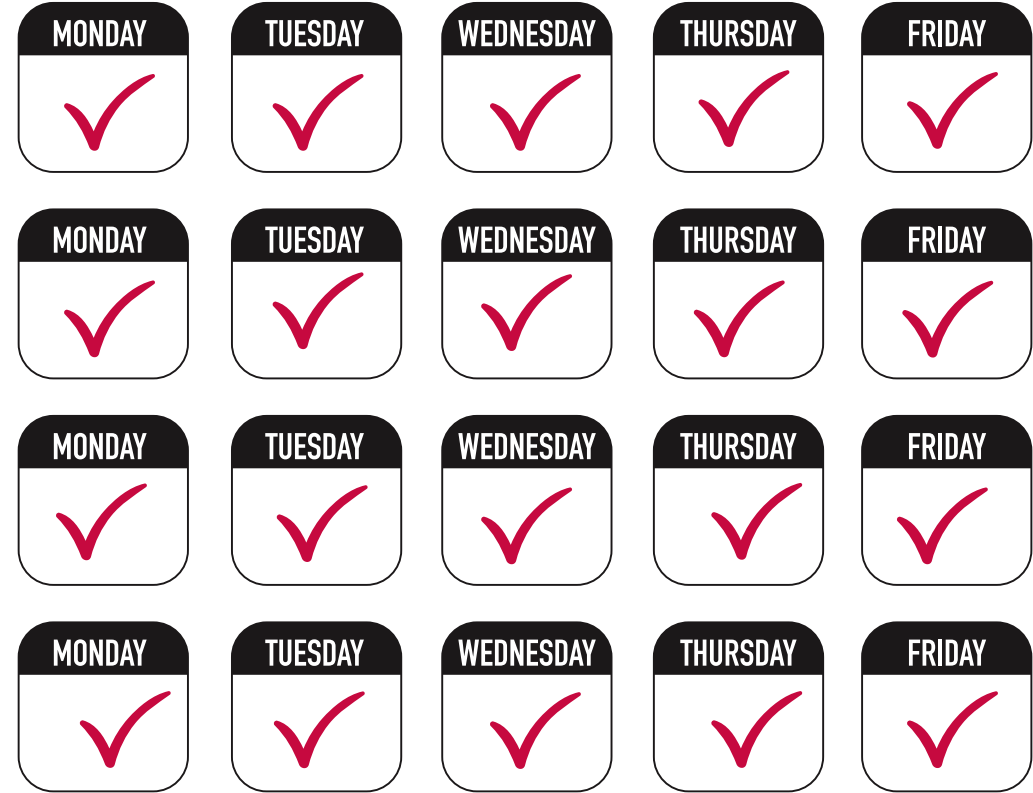
Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up
8. Get into a routine



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up
8. Get into a routine
9. Stay on track



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up
8. Get into a routine
9. Stay on track
 - 2-minute rule



Guidelines for a Great Daily Huddle

1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up
8. Get into a routine
9. Stay on track
 - 2-minute rule
 - The parking lot



1. Use first names
2. Start with an icebreaker
3. Facilitate, don't present
4. Keep it short
5. Start and end on time
6. No phones or distractions
7. Stand up
8. Get into a routine
9. Stay on track
 - 2-minute rule
 - The parking lot
10. Involve the entire team

Guidelines for a Great Daily Huddle





Daily Huddle Benefits:

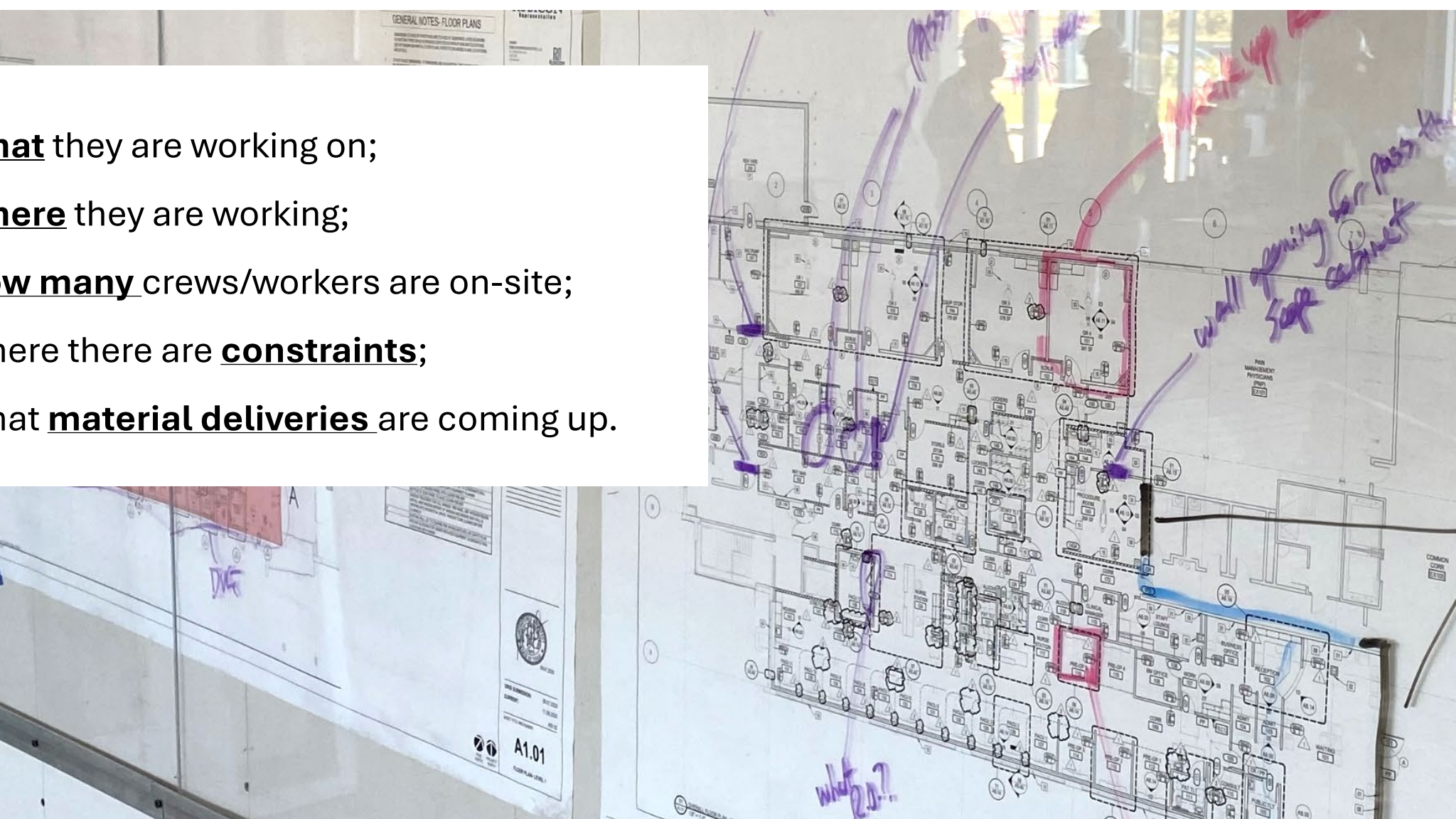
- Greater accountability amongst trade partners
- Beginning step in shifting/improving jobsite culture
- Reduced fire drills for field leaders



VISUAL COMMUNICATION



Floor Plans/Elevations Under Laminate + Dry Erase Markers:



1. **What** they are working on;
2. **Where** they are working;
3. **How many** crews/workers are on-site;
4. Where there are **constraints**;
5. What **material deliveries** are coming up.

1. **What** they are working on;
2. **Where** they are working;
3. **How many** crews/workers are on-site;
4. Where there are **constraints**;
5. What **material deliveries** are coming up.



SKILES GROUP

DELIVERIES

DAY	TRADE	MATERIAL	TIME	TRUCK TYPE	UNLOAD AREA	METHOD
MON 6/5 <small>DATE</small>	DRYWALL	SHEETROCK	6:45 AM	SEMI	MATL. LAYDOWN EAST	FORK LIFT
TUES 6/6 <small>DATE</small>						
WED 6/7 <small>DATE</small>						
THUR 6/8 <small>DATE</small>	DRYWALL	METAL STUDS	7:30 AM	SEMI	MATL. LAYDOWN EAST	FORK LIFT
FRI 6/9 <small>DATE</small>						



SKILES GROUP

INSPECTIONS

DAY	TRADE	INSPECTION	NAME	TIME	RESULTS	FOLLOW UP
MON 6/5 <small>DATE</small>	ELEC.	AREA B IN WALL	TOBY	8:00 AM	TBD	TBD
	PLUMBING	AREA B IN WALL	BRETT	8:30 AM	TBD	TBD
TUES 6/6 <small>DATE</small>						
WED 6/7 <small>DATE</small>						
THUR 6/8 <small>DATE</small>						
FRI 6/9 <small>DATE</small>	DRYWALL	SCREW INSPECTION	EDUARDO	9:00 AM	TBD	TBD



Visual Communication Benefits:

- Improved trade-to-trade communication
- Greater awareness of project direction
- Facilitates meaningful collaboration of work activities between trades



MANAGING CONSTRAINTS



SLOW

SPEED

BUMP

ETE

SIS

R

0 11 12

CONSTRAINT MANAGEMENT

#	WHAT	WHERE	WHO	WHEN
1	RFI 80 Dimension review	Mech Yd Piers	Francisco	6/15
2	Box Culvert material for H	Zoueh	Gerrard	
3	RFI 84 - Power to Vestibule FCU & Auto ops	LI: F, Bk ws		
4	Mech Yard Dim. Clarification	Mech Yd	Justin	
5	Form liner for headwalks	Zoueh B.D.F		
6				
7				
8				
9				
10				
11				



1 Fine
2
3
4
5
6 Drain
7
8 Drain
9 Ins
10 Void
11 Fine
12
13 Med
14 Ex

CONSTRAINT MANAGEMENT

#	WHAT	WHERE	WHO	WHEN
1	SHEETROCK IMPACT ELEC. TRIM	AREA A	RAFAEL	6/5
2	MED GAS QUICK CONN. DELIV.	AREA A	PAUL	6/7
3	PT #21 MISSING FINISH SCH.	AREA B	RAFAEL	6/15
4	FLOOR FLOAT APPROVAL	AREA C	TOM	6/9
5	DUCT VS. LIGHT FIXT. CONFLICT	AREA B	MARTIN	6/9
6	OR LIGHT BOOM SUPPORT STRUT CONFLICT	AREA C	AUSTIN	6/13
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



Constraint Management Benefits

- Deepened accountability among team members
- Greater awareness of root causes
- Improved resolution speed

LAST PLANNER SYSTEM





WHY USE THE LAST PLANNER SYSTEM?

- ✓ Remove silos
- ✓ Push -vs- Pull
- ✓ Make reliable commitments
- ✓ Improve project direction and flow
- ✓ Create trust and accountability
- ✓ Identify and address root causes for incomplete work

Where Teams Go Wrong

1. Trade in one 2-hour meeting a week for 5 one-hour meetings a week.
2. The trades don't experience the value and don't show up or participate.
3. The superintendent presents and doesn't facilitate.



1. Master Scheduling

2. Phase Scheduling

3. Look-Ahead Planning

4. Weekly Work Planning

- Three-Week Look-Ahead
- Activities/Work to Be Done
- Manpower Tracking
- Constraints/Needs

5. Percent Plan Complete





1. Master Scheduling

2. Phase Scheduling

3. Look-Ahead Planning

4. Weekly Work Planning

- Three-Week Look-Ahead
- Activities/Work to Be Done
- Manpower Tracking
- Constraints/Needs

5. Percent Plan Complete





REGENT
SURGICAL HEALTH
Regent Amarillo CV ASC

Regent Amarillo CV ASC			Week 22							Week 23							Week 24							Week 25							Week 26							Week 27							Constraints						
			June 26, 2023							July 3, 2023							July 10, 2023							July 17, 2023							July 24, 2023							July 31, 2023													
ID#	Trade Partner	Task	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S							
		Interior	26	27	28	29	30	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	31	1	2	3	4	5	6							
1	ERAC Paint	Tape & Bed/Prime Walls																																																	
2	Rudd-Palmer	Seal Penetrations	●	●		●	◆																																												
3	ERAC Concrete	Pour Generator Slab																																																	
4	American Electric	Set Generator																																																	
5	Audio Visual	Pull Fire Alarm Wire	●	●	●	●	◆																																												
6	Audio Visual	Pull Nurse Call Wire	●	●	●	●	◆																																												
7	JCI	Pull Control Wire	●	●	●	●	◆																																												
8	Communications	Pull Data Cabling	●	●	●	●	◆																																												
9	ERAC Millwork	Install Millwork	●	●	●	●	●			●		●	●	●			●	●	●	●	◆																														
10	One Source	RR Tile/Backsplash	●	●	●	●	●	◆																																											
11	ERAC Framing	Frame Hardlids	●	●	●	●	◆																																												
12	ERAC Framing	Install Ceiling Grid	●	●	●	●	◆																																												
3	American Electric	Permanent Power On	◆																																																
14	MMM Mechanical	AHU/RTU Startup	◆																																																
15	American Electric	Drop Light Fixtures	●	●	●	●	●			●		●	●	●			◆																																		
16	American Electric	Above Ceiling Inspection															◆																																		
17	MMM Mechanical	Install Registers/Grilles/Diffusers	●	●	●	●	●			●		●	●	●			◆																																		
18	Summit Fire	Drop Heads	●	●	◆																																														
19	MMM Plumbing	Set Plumbing Fixtures								●		●	●	●			●	●	●	◆																															
20	Summit Fire	Trimout Heads			●	●	●			●		◆																																							
21	Summit Fire	Hydro Test										◆																																							
22	Audio Visual	Trimout Fire Alarm								●		●	●	◆																																					

1. Master Scheduling

2. Phase Scheduling

3. Look-Ahead Planning

4. Weekly Work Planning

- Three-Week Look-Ahead
- Activities/Work to Be Done
- Manpower Tracking
- Constraints/Needs

5. Percent Plan Complete





5. Percent Plan Complete

- Activities Completed
- Activities Promised
- Weekly Team Percentage
- Root Cause Categories
- Root Causes for Work Missed
- 12-Week Snapshot



PERCENT PLAN COMPLETE

CURRENT WEEK SNAPSHOT

ACTIVITIES COMPLETED

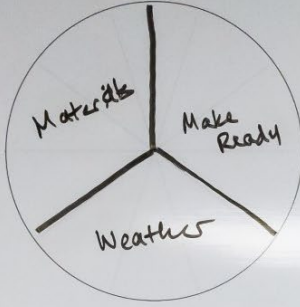
18
21

ACTIVITIES PROMISED

CURRENT TEAM SCORE

86%

ROOT CAUSE ANALYSIS



12-WEEK SNAPSHOT



12 WEEK PERCENT PLAN COMPLETE TEAM PERFORMANCE

ACTIVITIES PROMISED: 21
ACTIVITIES COMPLETED: 17
% TEAM PERFORMANCE: 81

12 WEEK ROOT CAUSE ANALYSIS

	1	2	3	4	5	6	7	8	9	10	11	12
1. INCLEMENT WEATHER	1											
2. MANPOWER												
3. MACHINERY												
4. DESIGN WITH SUBMITTALS, ETC.												
5. MAKE READY	1	1										
6. MATERIALS		1										
7. POOR SCHEDULING												
TOTAL	4											



PERCENT PLAN COMPLETE

CURRENT WEEK SNAPSHOT

ACTIVITIES COMPLETED

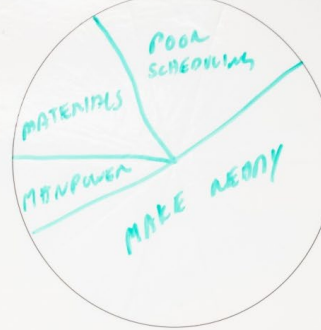
19
32

ACTIVITIES PROMISED

CURRENT TEAM SCORE

59%

ROOT CAUSE ANALYSIS



12-WEEK SNAPSHOT



12 WEEK PERCENT PLAN COMPLETE TEAM PERFORMANCE

ACTIVITIES PROMISED: 23
ACTIVITIES COMPLETED: 17
% TEAM PERFORMANCE: 74

12 WEEK ROOT CAUSE ANALYSIS

	1	2	3	4	5	6	7	8	9	10	11	12
1. INCLEMENT WEATHER												
2. MANPOWER	1	3	1	1								
3. MACHINERY												
4. DESIGN WITH SUBMITTALS, ETC.	1											
5. MAKE READY	1	3	3	7								
6. MATERIALS	1			2								
7. POOR SCHEDULING	2	5	2	3								
TOTAL	6	12	6	13								

PERCENT PLAN COMPLETE

CURRENT WEEK SNAPSHOT

ACTIVITIES COMPLETED

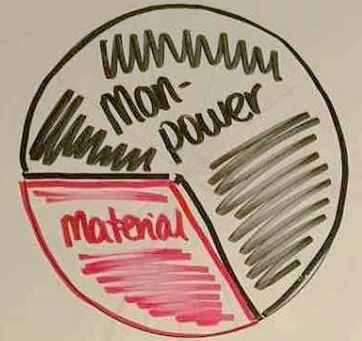
27
37

ACTIVITIES PROMISED

CURRENT TEAM SCORE

73%

ROOT CAUSE ANALYSIS



12-WEEK SNAPSHOT



12 WEEK PERCENT PLAN COMPLETE TEAM PERFORMANCE

ACTIVITIES PROMISED: 29
ACTIVITIES COMPLETED: 23
% TEAM PERFORMANCE: 79

12 WEEK ROOT CAUSE ANALYSIS

	1	2	3	4	5	6	7	8	9	10	11	12
1. INCLEMENT WEATHER												
2. MANPOWER	6	7	7	1	6							
3. MACHINERY												
4. DESIGN WITH SUBMITTALS, ETC.												
5. MAKE READY				3								
6. MATERIALS							2					
7. POOR SCHEDULING							2					
TOTAL	6	7	7	6	8							

A construction worker wearing a hard hat and a safety vest is writing on a large grid chart with a marker. The chart is a Last Planner System (LPS) pull planning chart, showing a sequence of activities and their dependencies. The worker is focused on the task, and the background shows other workers and construction equipment, suggesting a busy construction site.

Last Planner System Benefits

- A trade-validated schedule (Pull not Push)
- Improved constraint identification/resolution of critical activities in look-ahead schedules
- Clear team understanding of weekly milestones and learning around failures (PPC)