

25TH ANNUAL



25TH LCI CONGRESS
OCTOBER 24-27, 2023

Ending the ICE Age to power the next EVs: The Lean/IPD journey starting @ Wolfspeed

Chris McCann, Vice President - Global Project Management, Wolfspeed, Inc

Leslie Buckheit, Sr. Director, Indirect Procurement, Wolfspeed, Inc

Sean Noonan, Vice President, Whiting-Turner

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

Thursday, Oct 26, 2023 - 2:30PM - 3:15PM

Presentation Overview

- Who is **Wolfspeed**
- Why we went the IPD Route
- How we went about getting alignment within our organization
- How we did it!

Key Takeaways

Things you *should* do

- **Build Alignment** with your business partners before approaching senior management is key
- **Start Small** and Build
- **Educate, Educate, Educate**
- Find & work with **like-minded partners**
- **Rely on experts** within your team
- **Be Good at Failing**

Things to *avoid* doing

- Don't underestimate the importance of **having robust communication**
- Being "too" remote – **Collaboration is better in person**
- **Assuming all parties are aligned on the schedule**

Silicon Carbide 101



WOLFSPEED AT A GLANCE



~\$13B
Market Cap



> 2,100 patents
Substantial IP Position



Largest Silicon
Carbide Provider



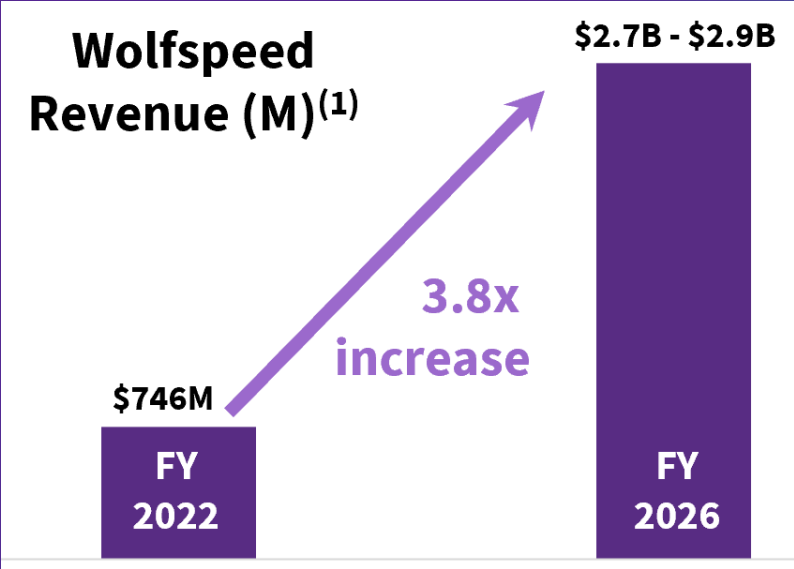
Founded
in 1987



~4,500
Employees



30+ Years of
Leadership



OUR PURPOSE



WE The people of Wolfspeed push the limits of what's possible.

HARNESS Through 30+ years of innovation, Wolfspeed has uniquely mastered new ways to use this powerful technology.

THE POWER OF Our work expands the boundaries of technology to make devices smaller, lighter, and more powerful.

SILICON CARBIDE

TO CHANGE THE WORLD We create the ingredients that inventors, innovators, and doers use to power a cleaner, better future.

FOR THE BETTER.

WHY THE WORLD NEEDS WOLFSPEED



Clean Energy

COVID's slow down brought global awareness



EV Market

World market push increased overall demand



SiC vs Silicon

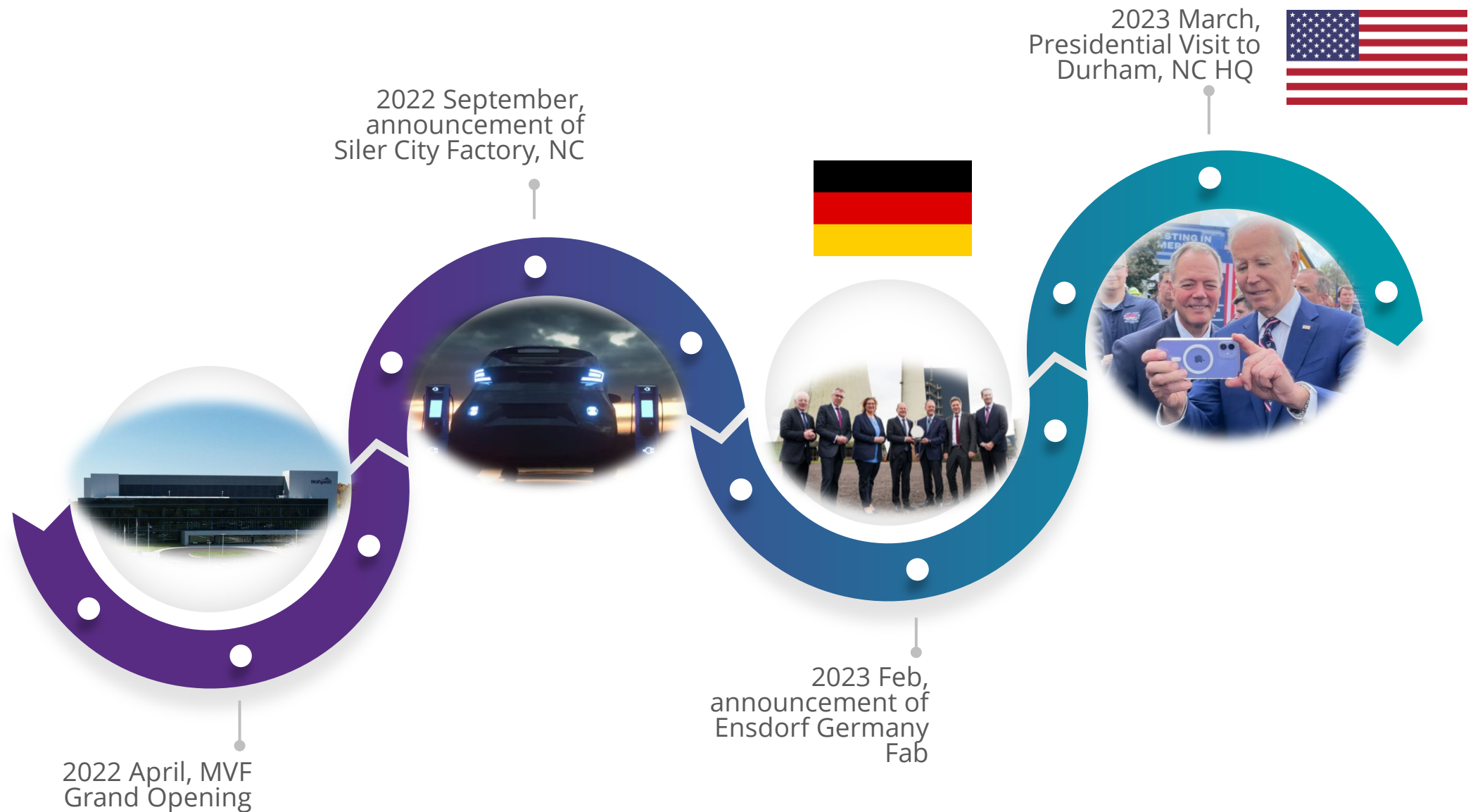
More Efficient - Charges faster & lasts longer – less loss



Hockey Stick Growth

Increase demand created unprecedented growth projections

The Jump Start to Our Growth



WALK THROUGH IPD



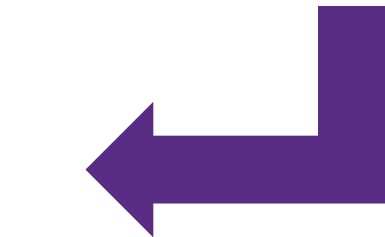
Project #1 – In the Spirit of IPD: 2020 **\$MM**



Project #2 – IPD “Lite”: 2021 **\$MMM**



Project #3 – Full IPD/IFOA: 2022



\$B

LEAN BEGINS WITHIN – COMPANY ALIGNMENT



SVP and CEO addressing the first Big Room

Find the Passion!

Procurement and **Global Facilities** jointly pushed IPD processed into Wolfspeed's construction projects.



Spread the Word

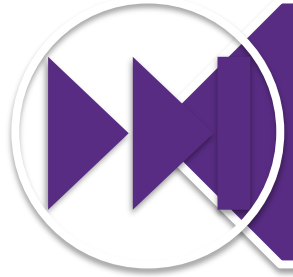
We quickly explained to **leadership and support organizations** how IPD was the path to meet our aggressive timelines.



Change the Company Culture

Culture **celebrates innovation** & pushing the envelope

LEAN CONSTRUCTION IN WOLFSPEED'S EXPANSION



Faster Execution



More
Collaboration

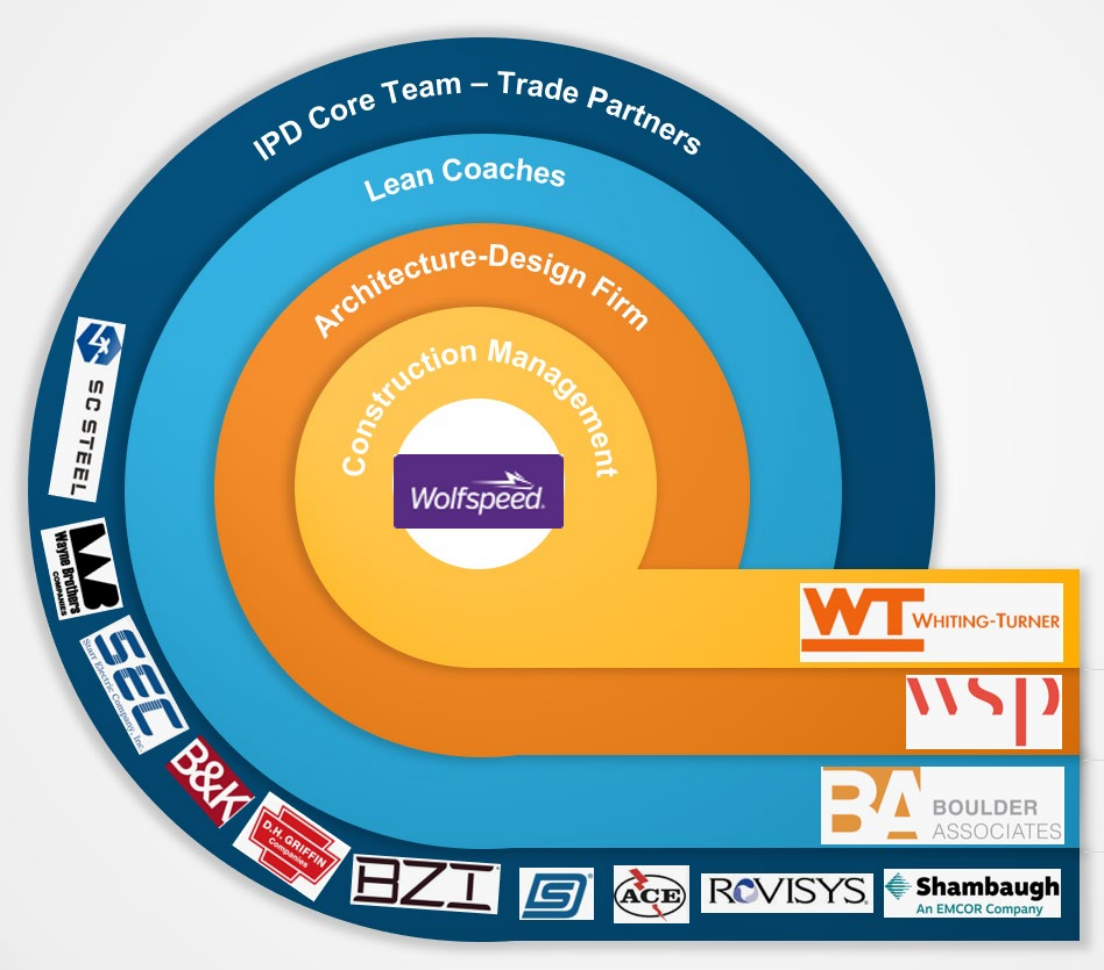


Reduced Costs &
Waste



FOCUSING ON THE ADVANTAGES OF PARTNERS TO BUILD THE TEAM

Progression of Partner Selection



A3 for Trade Partners

Project Title - Trade Partner RFP	A3 No. 6	Changelogs: Sean Noonan, Kirk Healy	Key Dates: Distribute RFP - 6/29/2022, Response Due Date - 6/29/2022, Interviews - TBD, Award - NLT 7/26/2022
Date: June 20, 2022	Collaboration: Wm. Folsom, Matt Blumling, Andy Wilson, Ki Reed, Doug Lee, Michael Connor, Chris McCain, Leslie Buchheit		
1. PROJECT TEAM			
2. PHASES AND CRAFT CRITERIA			
3. COMMERCIAL TERMS			

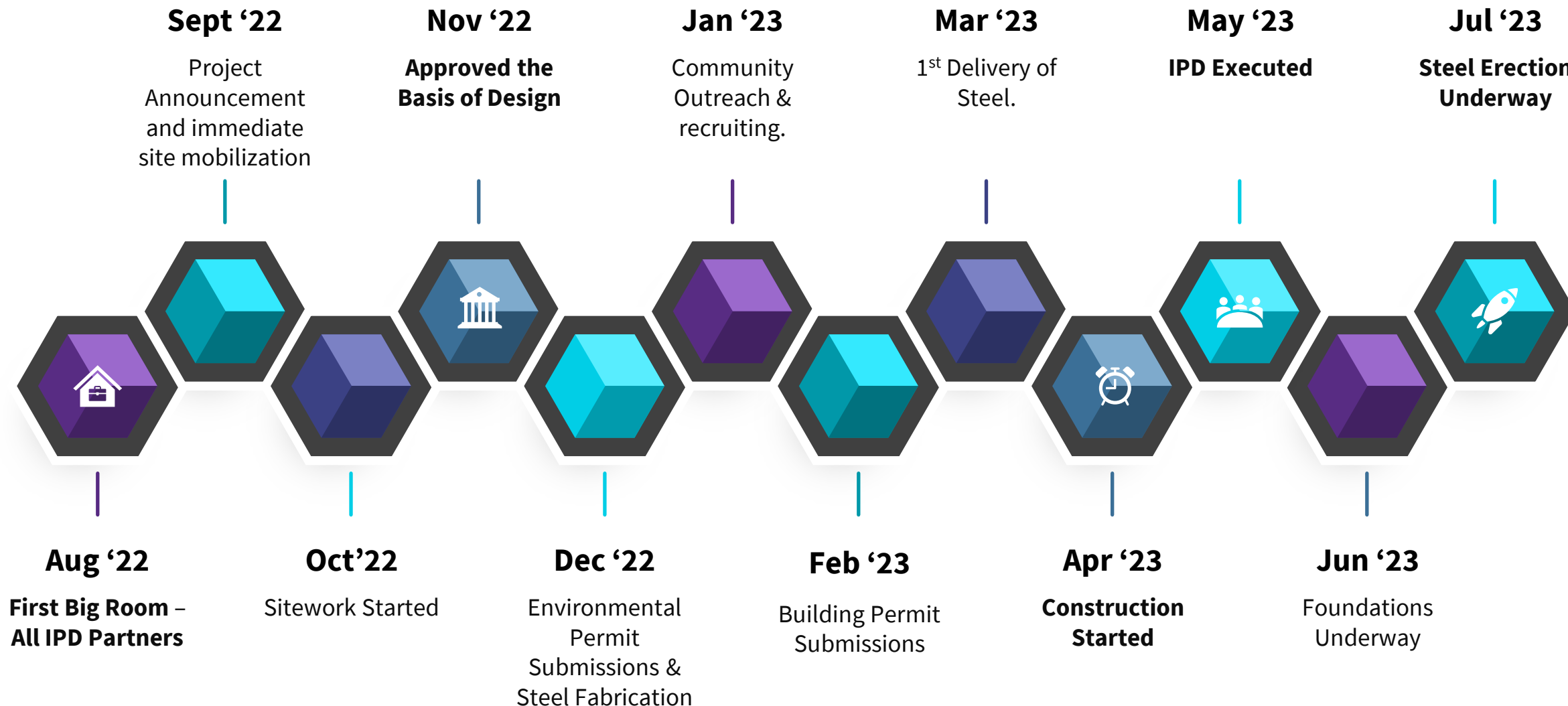
CBA # 001		PROJECT HIBS		ATTRIBUTES OF WORK PACKAGE			
CBA NAME		CBA TEMPLATE V3.4					
DATE							
				Weight	1	2	
					Submitted	Submitted	
FACTORS	CRITERIA	NOTES *					
Proposed Team	The more specific team members identified and their roles are defined, the better	1a. Identify specific team members committed for this project and clarify their roles. 5+ clear roles is enough resources. 1 unclear and lacking staff.		5	5	25	3
Staff Retention	More competitive labor rates for staff are preferred	1b. Labor Rate: Provide Base Labor Rate for Each of Your Resume Staff & a Separate Burden %		3	5	15	5
Craft Retention	Competitive labor rates for craft are preferred	1c. Labor Rate: Provide Base Labor Rate for Each of Your Key Craft Positions & Separate Burden %		4	4	16	5
Shop Retention	Competitive labor rates for shop are preferred	1e. Shop Labor - explain if this is at the same rate & burden provided or different rate		3	N/A	0	N/A
Safety	Lower EMR and PIR is preferred	3a. Provide your EMR and PIR for the past three years. Below 0.6 = 5; 0.6 - 0.69 = 4; 0.7 - 0.89 = 3; 0.9 - 1.0 = 2; 1.01 - 1.1 = 1. (W/B=0.695) RIR: Below 0.7 = 5; 0.71 - 0.99 = 4; 1.1 = 3; 1.6 = 2; 2+ = 1		5	4	20	1.5
Insurance	Lower GLI rate is preferred	3b. Provide your General Liability Insurance (GLI) rate as a % of Cost of Work. Below 0.5 = 5; Below 1.0 = 3; Above 1.0 = 1		4	5	20	1
Work Packages	Identify work packages - knowing & right sizing your capabilities is preferred.	3d. Identify for which work packages you are capable.		4	5	20	5
On-Site Craft Hours	A flatter on-site craft hour curve is preferred	3e. Identify what % of craft will be employees directly employed by your company vs. by temp labor company. 100% - 91% = 5; 81% - 90% = 4; 71 - 80% = 3; 61% - 70% = 2; 50% - 60% = 1; 49% & below = 0		3	5	15	
% of Direct Employees	A higher percentage of direct employees is preferred	4a. Specific examples of your experience working in the BIM model (e.g., clash detection, drawing within a shared design model, contributing to the construction documents within the model, etc.)		5	5	25	
BIM Experience	More specific examples that clearly illustrate better BIM practices is preferred	4b. Specific examples that illustrate your design assist experience (e.g., what you vs. the design team should perform) to create an efficient workflow for your scope of work. At what point should the designer stop drawing and start construction for your scope of work?		4	5	20	
Design Assist Experience	More specific examples that clearly illustrate better design assist practices is preferred			4	5	20	3

Supplier Selection Sheet



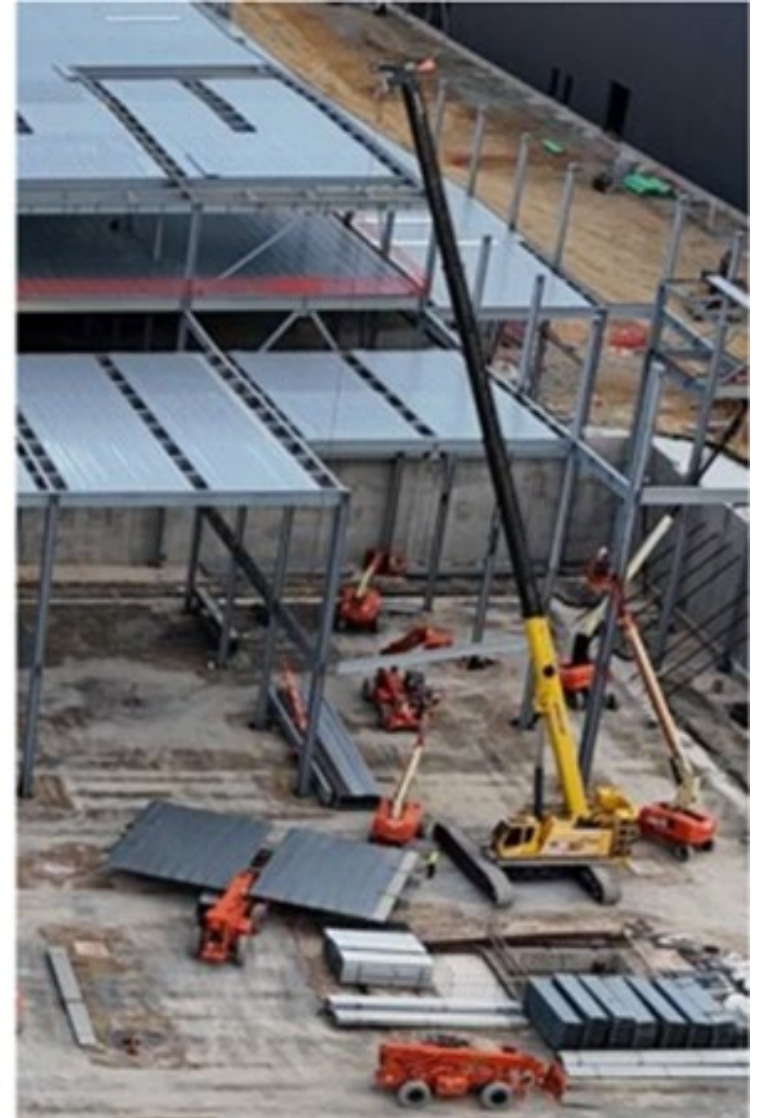
Faster Execution

Siler City Factory





Siler City Factory – 9/19/22 - three days after project announcement



Siler City Factory – 9/22/23

PROJECT CONDITIONS OF SATISFACTION – TEAM CHARTER



Project SCF PROJECT CONDITIONS OF SATISFACTION

V4.0 SEPTEMBER 2023

CoS MISSION STATEMENT

The Project Conditions of Satisfaction (CoS) define what “success” means for our Team. The CoS provide focus on alignment of interests and priorities for all stakeholders, and guide decision making throughout Design and Construction.

The Key Components to the CoS are:

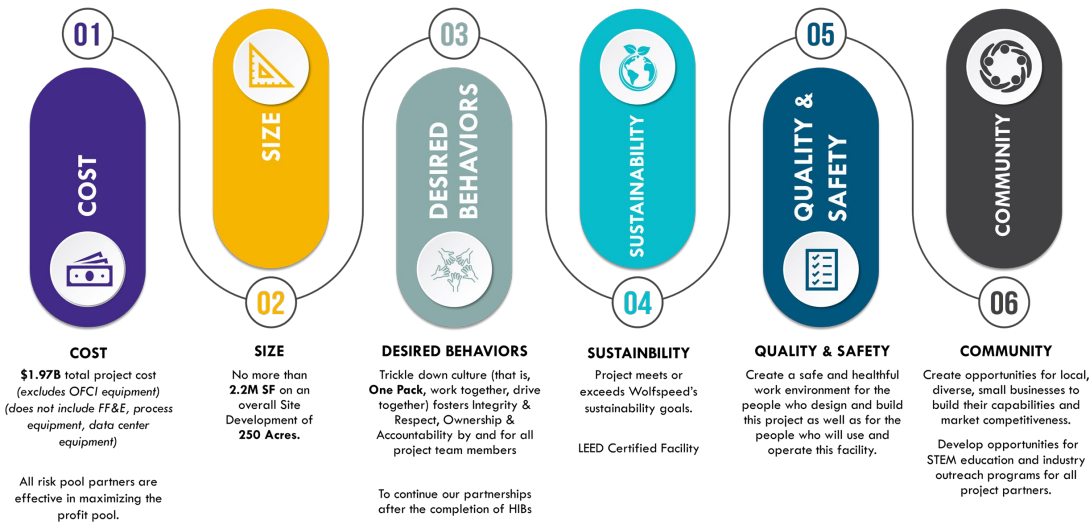
- **Wolfspeed's Business Objectives & Critical Success Factors**
- **The Project Team's Goals & Desired Behaviors**

BUSINESS OBJECTIVES

SCOPE – Create a facility that enables Wolfspeed to lead the innovation and commercialization of Silicon Carbide and GaN

SCHEDULE – Begin installing growers in **January 2024** & Testing in **May 2024**

CRITICAL TO SUCCESS FACTORS



TEAM GOALS

SAFETY

SCF Collaborative Safety Program – Developed, Coordinated, and Improved by a Safety Committee to establish the Culture as a Core Value.

Design + Manage For Safety – The team will leverage all opportunities to create a safe work environment for project delivery team members as well as the end users through their design work and on-site operations management.

SCHEDULE

Clear definition of scope and deliverables tied to milestones on a work plan that is communicated to everyone at a high and detailed level.

Collaborative development and implementation of short-term and long-term work plans that includes relevant representatives from ownership, design, and construction.

Create handoff transparency between decisions, design, procurement, installation, and commissioning so we can reveal roadblocks to continuous workflow and collaboratively work to remove them.

COST

We will establish a regular cadence to review and manage Budget, Program, and Scope.

The team will use Target Value Delivery to create transparency in how the budget ties directly to the BOD.

Core Group will establish KPIs for steady profit distribution targets that account for managed risks and assure reasonable and appropriate team member outcomes

QUALITY

Quality is everyone's responsibility, and it "Starts Day One"

Leverage the best innovative practices available to establish and continuously improve product and process quality standards

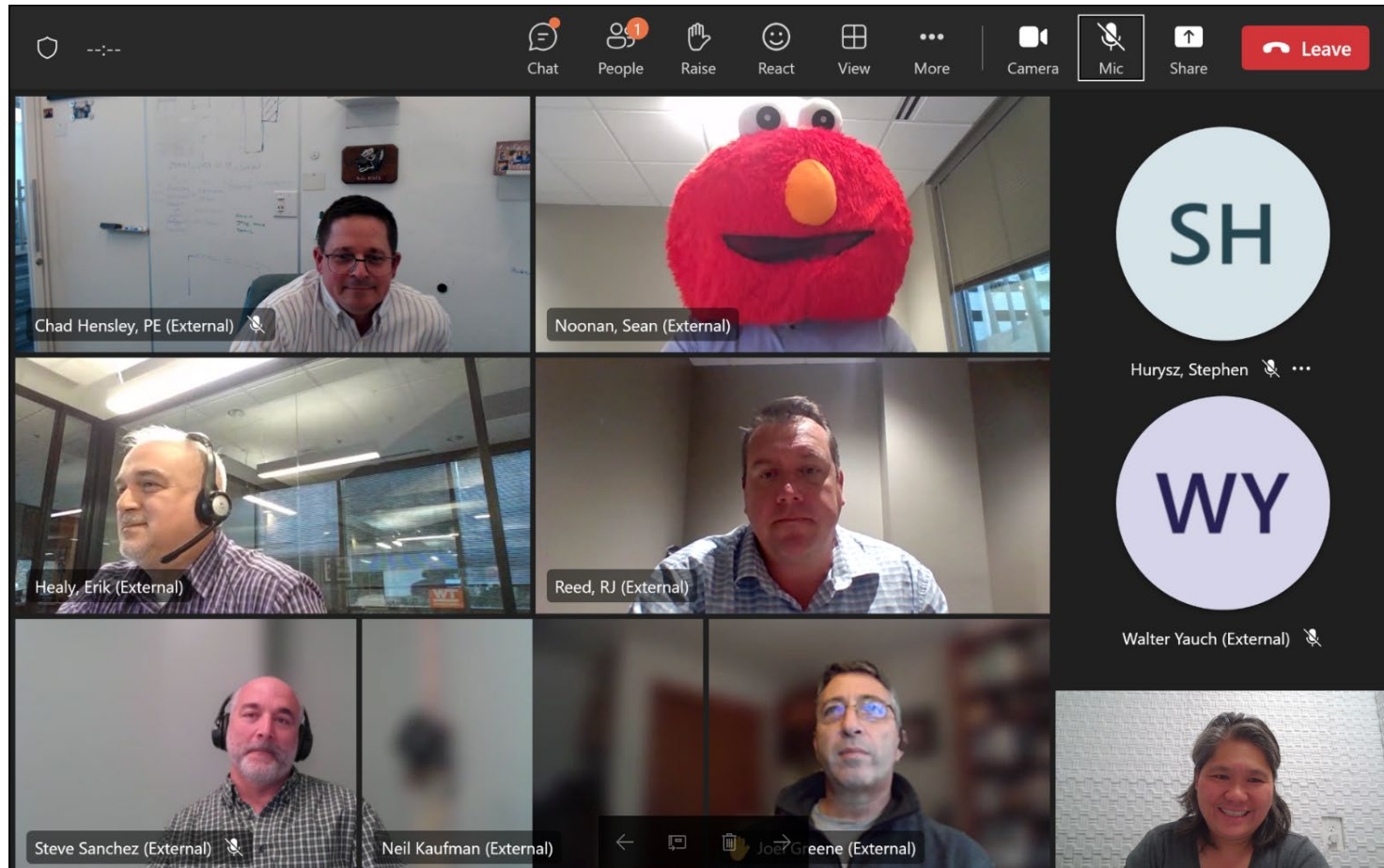
DESIRED BEHAVIORS

- ALIGNMENT** – The team stays on track with key project milestones to properly support WS's mission, vision, and business objectives / strategy and ensuring not only solid onboarding / but stay-onboarding
- COMMUNICATION** – Consistent communication between leadership and Cluster Groups to foster / cultivate proactive, collaborative problem solving
- TEAM BUILDING** – Quarterly BBQs (or equivalent) to celebrate small wins and overcoming recent challenges
- LEARNING / CONTINUOUS IMPROVEMENT** – Create a Learning culture that highlights a **Lessons Learned** program that regularly share recent lessons learned and works on continuous improvement
- CREATE A GOOD STORY** – Through our experience on this project, we have a story that we want to share with others to help our industry deliver projects better

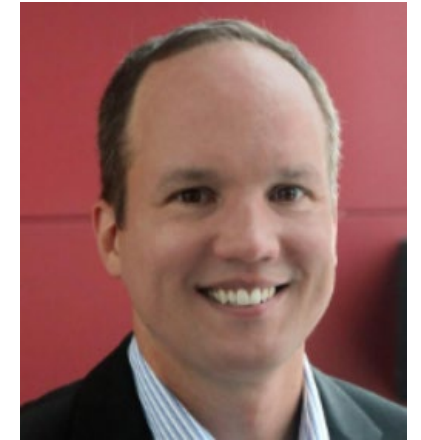
TEAM SIGNATURES

Handwritten signatures of team members, including names like Sam Hooper, Tommaso Brice, Melvin Mathew - PSP, and others.

Reduced Costs & Waste



THE EVOLUTION OF PULL PLANNING FOR EARLY VALIDATION TO TAKT FOR CONSTRUCTION FLOW



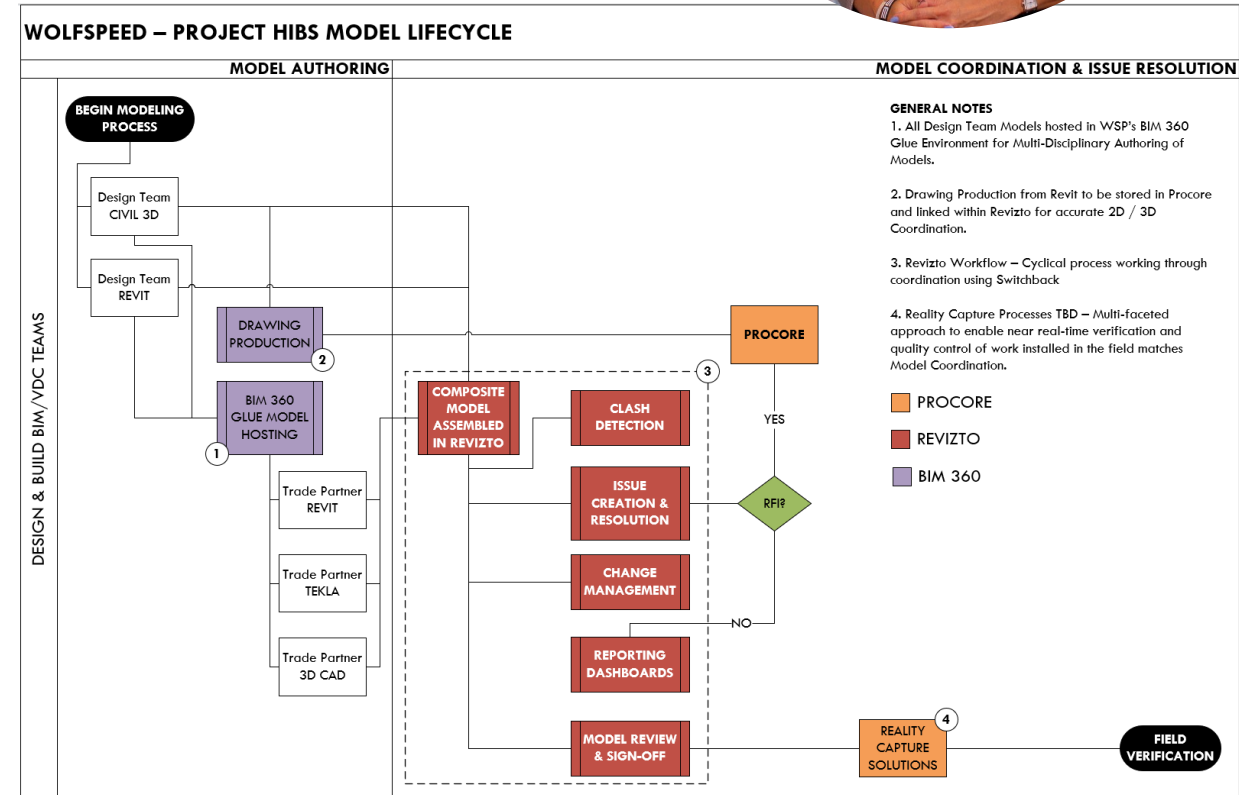
Matthew Jogen
vPlanner
Project Director

*Instrumental in the success of our
Design Pull Planning sessions*

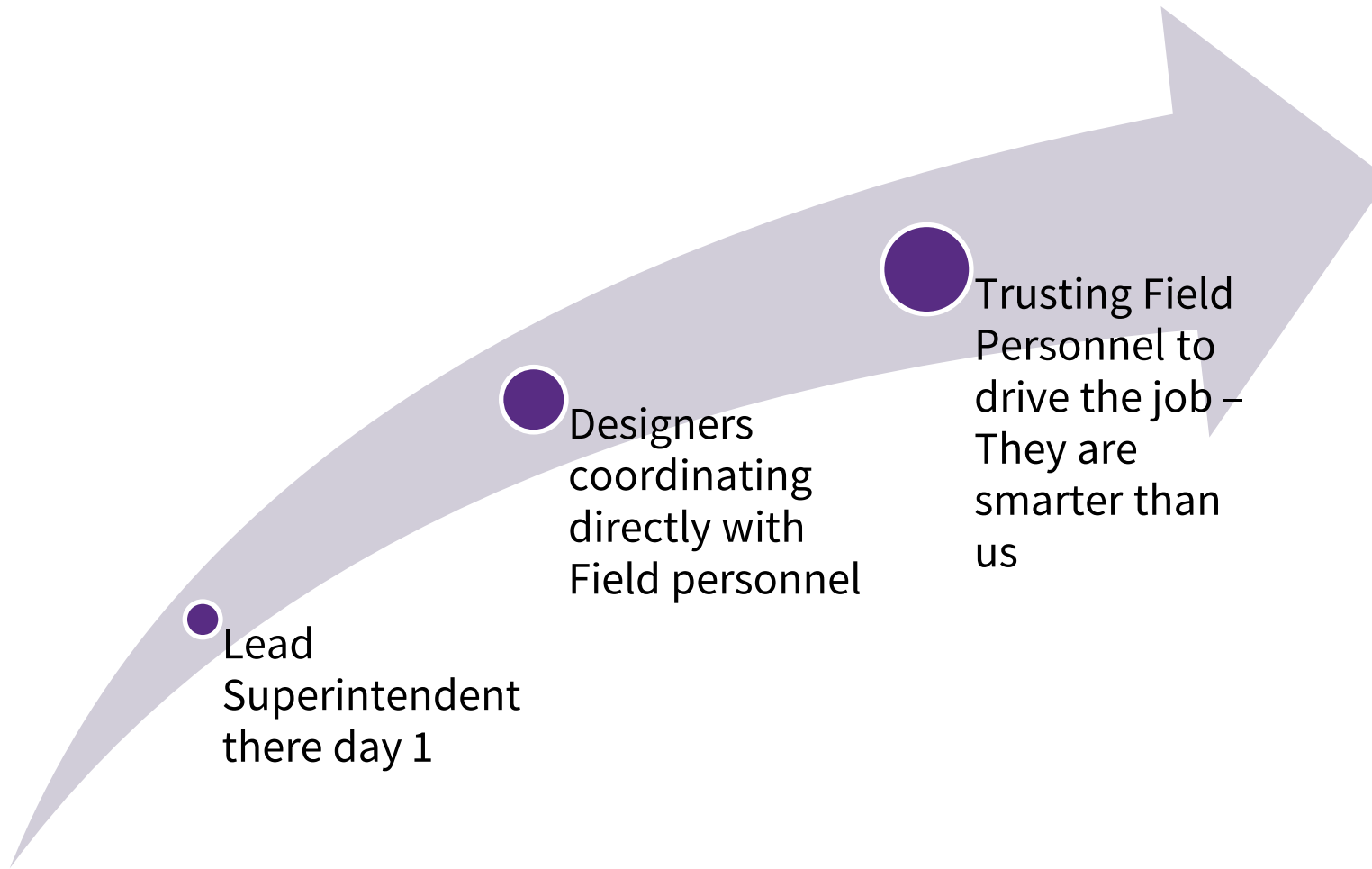
BIM WORK

- 2D drawings governing, but the model needs to be right and right early – plan the use of the model up front – Single Source of Truth
- Taking the model into constructability reviews and using it for TAKT
- Things not being tagged... Challenges for estimating and scheduling from the model
- PID generation early to guide all other design
- In Valeh we trust!
- Story of going from design model to BIM360 w/TP to Reviewing “shop drawings” in the model – then Revisto for coordination and clash detection and being the final single source of truth

Valeh Nowrouzian
Whiting Turner
BIM Manager



DESIGNING TO WHAT THE FIELD NEEDS



"In Doug we Trust"



Doug Lee
Whiting Turner
General Superintendent



WORKFORCE ENGAGEMENT

Various Wolfspeed Programs

- Apprenticeship NC for DOL and division of NC community college system
- Technician Certification Program at Durham Tech
 - Extending to Central Carolina CC
- Career and College Promise for high school students in NC counties
- Customized Training Programs at Central Carolina CC
- Classroom visits to graduating high school classes in NC
- Community college spring fairs
- Sponsorships, scholarships, apprenticeships, career fairs and more



Six Party Core Group for Workforce

GOALS FOR WORKGROUP

- *To Be The Project Of Choice In The Carolinas*
- *Get The Local And Regional Communities Involved In The Development Of This Site*
- *Strengthen The Bond Within The Site Through A Culture Of Collaboration, Trust, And Respect For People*
- *Keep The Workforce At This Site, And Not Tempted Away By Other Projects Or Companies*
- *Share Workforce Across Different Trades, Helping Each Other To Meet Our Goals*
- *Retain People Who Can Work At Wolfspeed After The Project Is Completed By Creating A Sense Of Loyalty And Belonging*
- *Attract New Talent To The Workforce Through The Experiences Of Delivering This Amazing Project*

“ WORLD CLASS SITE ”



Allen Holloman
Starr Electric
Project Executive

Thank you, Allen!

HEALTH ASSESSMENTS



PROJECT SCF :: TEAM HEALTH ASSESSMENT



From time to time, it is important for us to check the health of our Team to make sure the processes and tools we are using are truly bringing value to the project and aligned with the Conditions of Satisfaction. The following questions will be distributed to the Team and ranked from 1 – 7, with 7 being most favorable and strongly agreeing with the statement.



BEHAVIORS OF TEAM

MOTIVATION

I am motivated to make this project a success.

MUTUAL RESPECT

The Team maintains professionalism and addresses issues and processes, not people.

CULTURE

We work in an effective, collaborative environment.

TRUST

When I express my concerns, they are considered respectfully.



MOOD OF TEAM MEMBERS

WORKLOAD

I am capable of managing my current workload.

RESOURCES

We have the appropriate resources so I can successfully deliver my project responsibilities.

PRIORITIES

The priorities of the project are clear.



ACCESS TO THE TEAM

TEAM ACCESS

I have the access I need to solve problems with other Team members.

ABILITY TO AFFECT CHANGE

I am able to offer suggestions to the Team that result in positive change.

TRANSPARENCY

The team shares information effectively.



PROJECT AWARENESS

SCHEDULE AWARENESS

It is clear how Design and Construction work impacts our Key Schedule Milestones (KSM).

PULL PLANNING

We are aligned on what's needed to achieve upcoming schedule milestones.

BUDGET AWARENESS

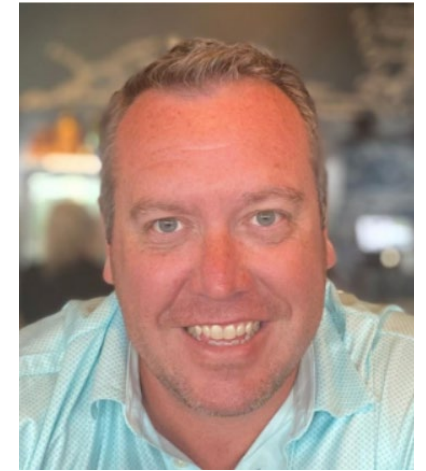
I understand the Current Working Estimate (CWE) and how it impacts profitability.

OPEN FEEDBACK

In addition to the questions above, we would also like to solicit open feedback from the team in the form of the following questions:

- **Start / Stop / Keep** – What should we Start Doing? What should we Stop Doing? What should we Keep Doing?
- **Self Reflection** – How do you feel you can provide additional Value to the Team? What areas do you need additional support? Anything else you want to share?

Link to MS Form Survey: <https://forms.office.com/r/mhkBdUtged>



RJ Reed
Whiting Turner
IPD Manager

A True Leader in LEAN



PROJECT SCF :: TEAM HEALTH ASSESSMENT
AUGUST 2023 OVERALL RESULTS



PROJECT SCF
Team Health Insights - Trends

PROJECT SCF TEAM HEALTH ASSESSMENT: From time to time, it is important for us to check the health of our Team to make sure the processes and tools we are using are truly bringing value to the project and aligned with the Conditions of Satisfaction. All survey questions are ranked from 1 – 7, with 7 being most favorable and strongly agreeing with the statement. All Delta values are calculated from the last two report months.

442
Total # of Responses

97
Previous Report # of Responses

107
This Report # of Responses

Risk Pool Member? Is your company a signatory to the IFOA?

Core Group

Not Core Group

200

0

Yes

No

141

122

146

Role on Project

Count

Commissioning

2

Consultant

5

Design Partner

35

DSI pipe

1

Eaton - Equipment Supplier

1

Grey Construction

1

Professional Service Provider

1

Roofing subcontractor

1

Service Provider

4

Trade Partner

174

Primary Cluster Group

Count

Architectural

110

Civil / Site

36

Electrical

19

I&C / Small Wires

48

1&C / Small Wires

15

Mechanical / Plumbing

79

Process Architecture/Engineering

33

Project Controls / BIM / QM / Sustainability / etc.

53

Structural

48

Category Avg Over All Time

Behaviors

Mood

Project Awareness

Team Access

6.0

5.5

5.0

4.5

5.84

5.98

5.86

6.09

6.11

5.08

5.14

5.12

5.27

5.33

5.46

5.54

4.89

4.69

4.80

5.24

5.50

4.43

5.08

5.12

5.27

5.33

5.46

5.54

Jan 2023

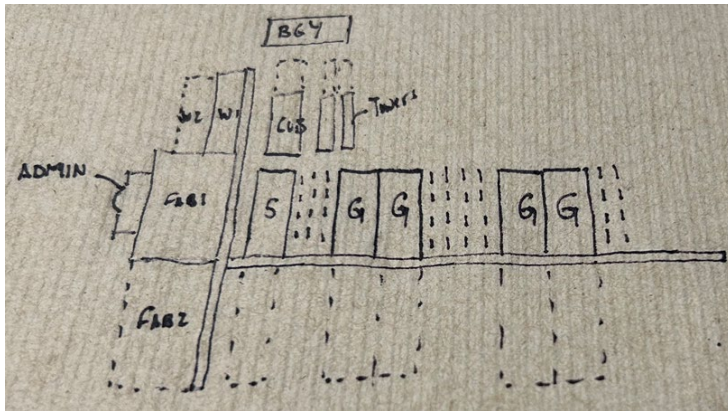
Jul 2023

Category	Attribute	Sub-Text	Avg Previous Report	Avg Most Recent Report	Delta	Delta %
Behaviors	Culture	We work in an effective, collaborative environment.	5.79	5.85	0.057	0.98%
Behaviors	Trust	When I express my concerns, they are considered respectfully.	5.98	5.94	-0.035	-0.59%
Behaviors	Mutual Respect	The Team maintains professionalism and addresses issues and processes, not people.	6.15	6.16	0.004	0.07%
Behaviors	Motivation	I am motivated to make this project a success.	6.43	6.50	0.062	0.97%
Mood	Priorities	The priorities of the project are clear.	5.30	5.10	-0.196	-3.70%
Mood	Resources	We have the appropriate resources so I can successfully deliver my project responsibilities.	5.52	5.59	0.073	1.33%
Mood	Workload	I am capable of managing my current workload.	5.77	5.79	0.021	0.37%
Project Awareness	Planning Process	We are aligned on what's needed to achieve upcoming schedule milestones.	5.18	5.11	-0.063	-1.22%
Project Awareness	Schedule Awareness	It is clear how Design and Construction work impacts our Key Schedule Milestones.	5.27	5.15	-0.119	-2.25%
Project Awareness	Budget Awareness	I understand the Current Working Estimate and how it impacts profitability.	5.28	5.67	0.395	7.47%
Team Access	Transparency	The team shares information effectively.	5.13	5.12	-0.013	-0.24%
Team Access	Ability to Effect Change	I am able to offer suggestions to the Team that result in positive change.	5.49	5.65	0.159	2.90%
Team Access	Team Access	I have the access I need to solve problems with other Team members.	5.75	5.84	0.089	1.54%

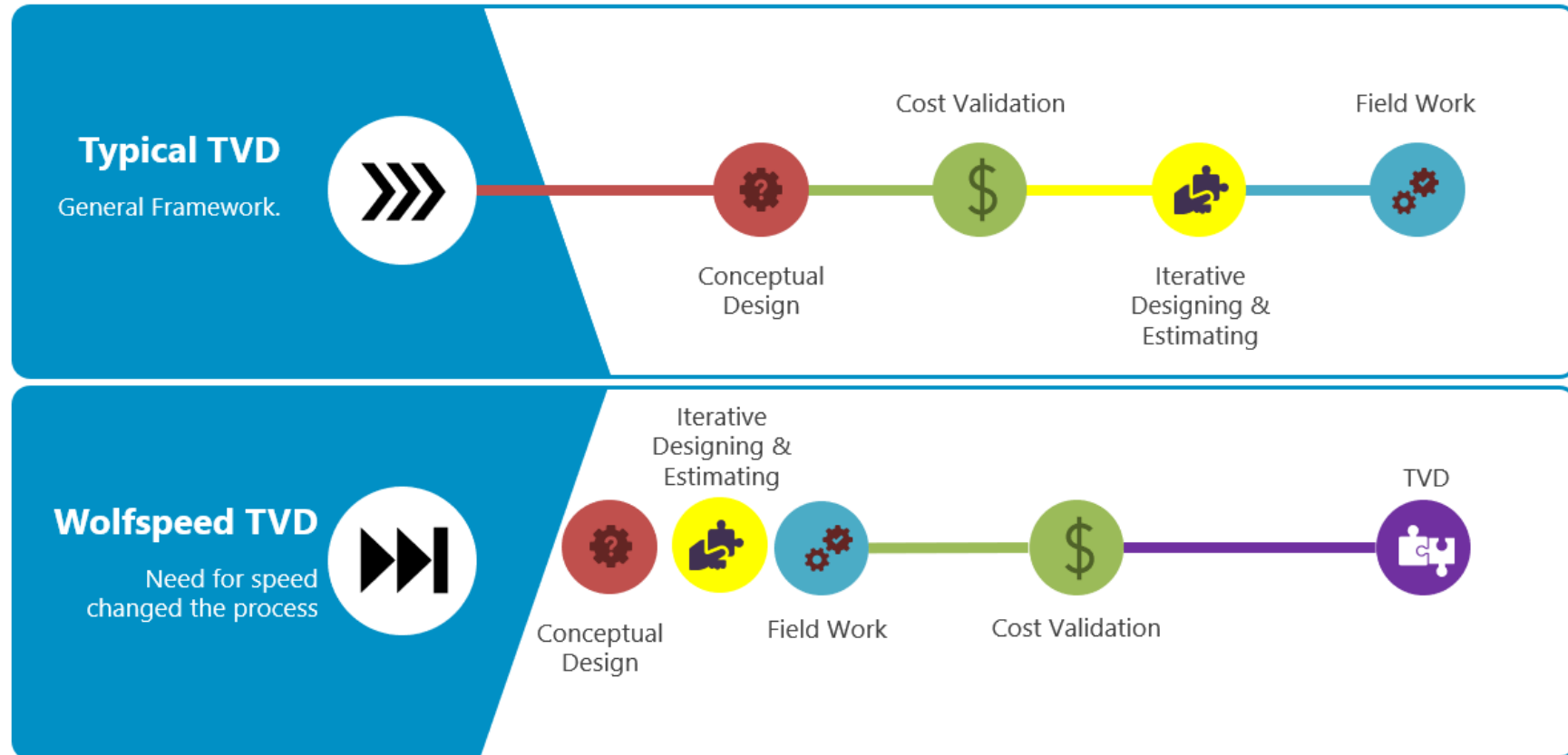
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23

WE WERE LATE IN ESTABLISHING ALLOWABLE COST AND TVD, BUT WE REALLY WEREN'T...WE JUST MOVED SO FAST

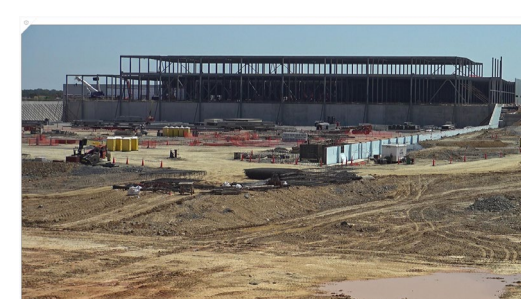
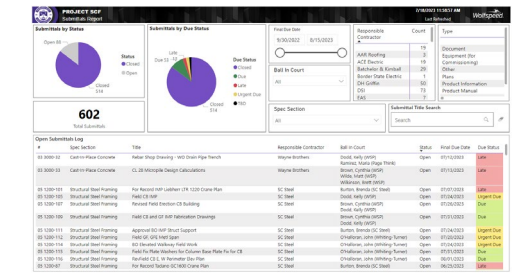
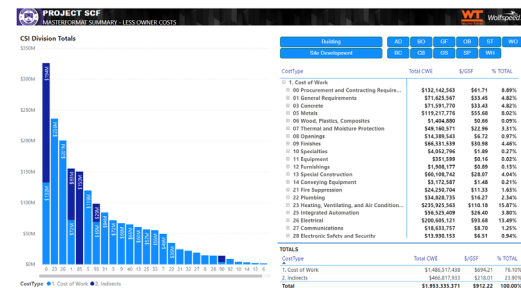
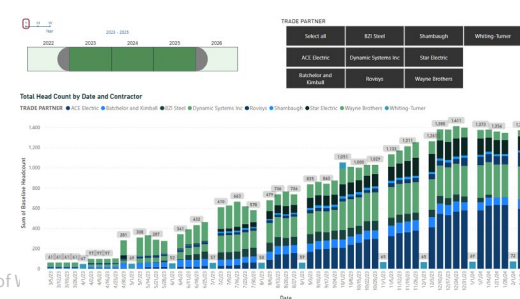
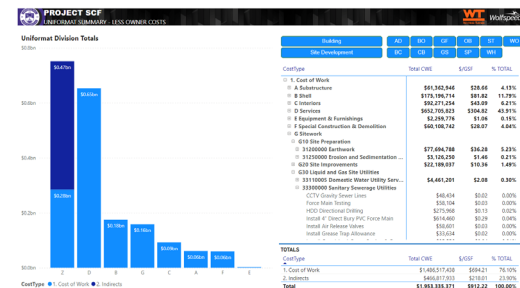
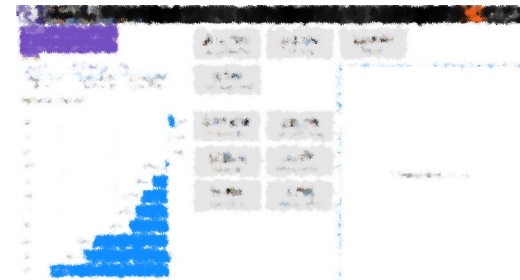
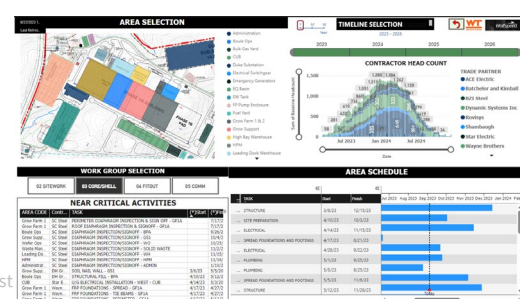
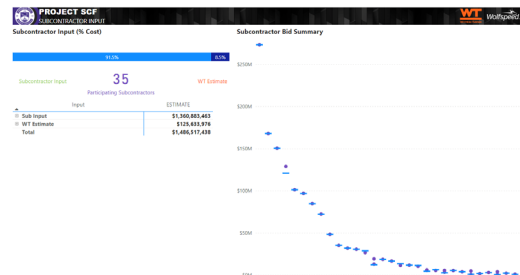
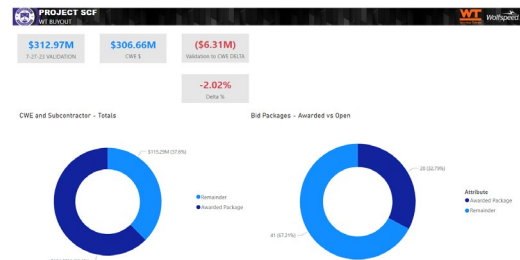
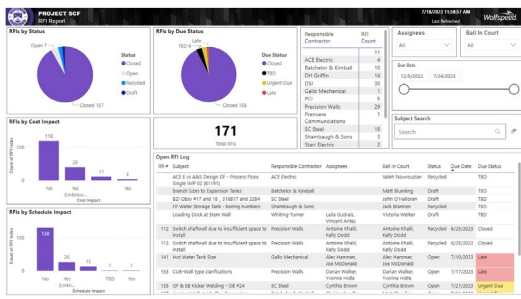
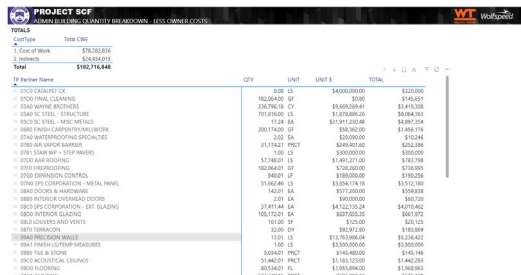
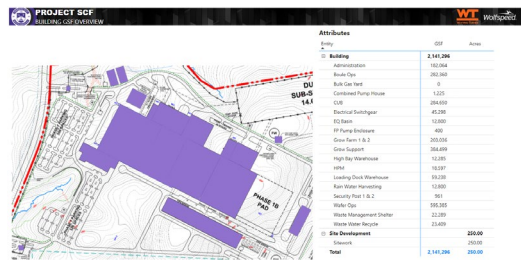


*First concept:
Winter of '21-22.*

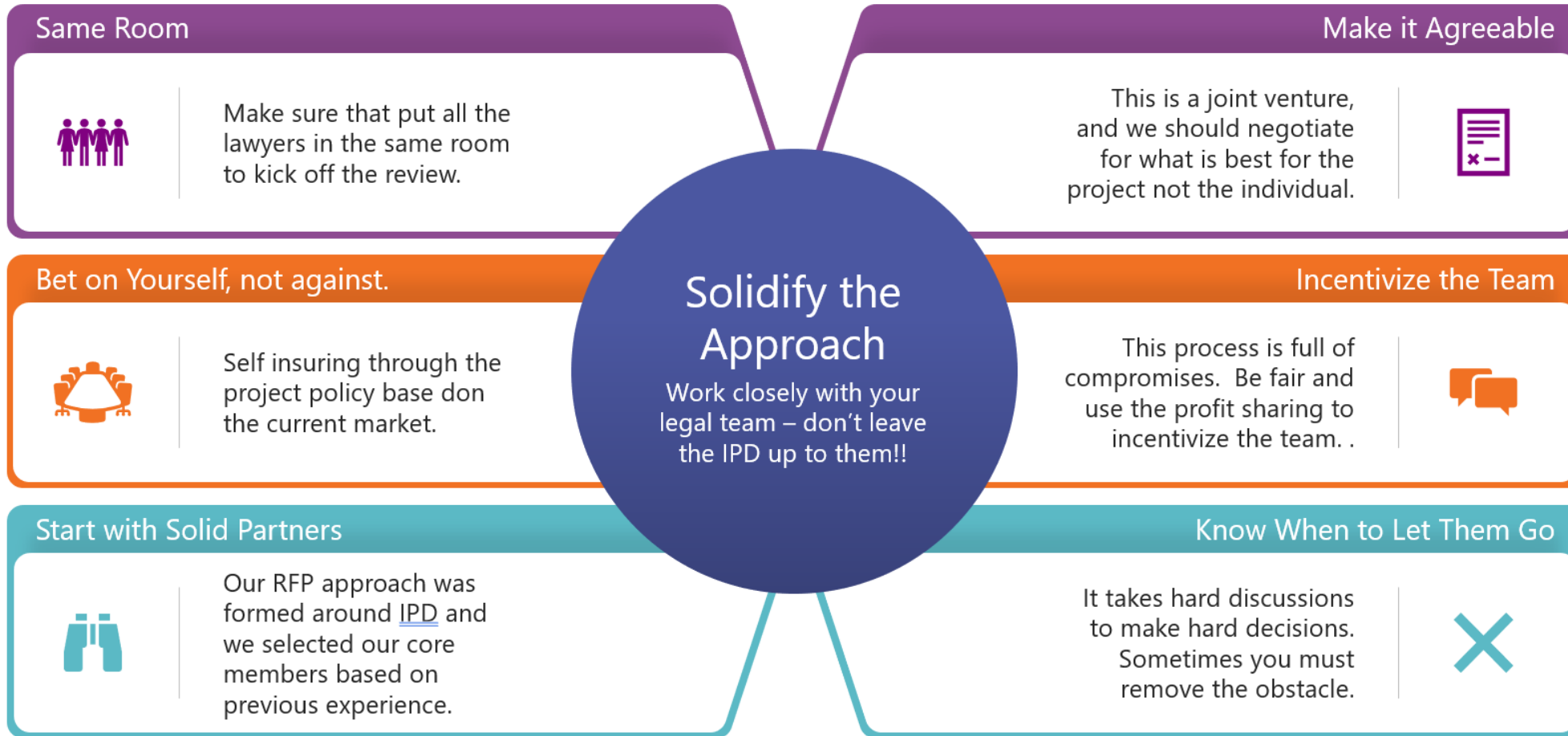


Inventing – Programming – Designing – Building – ALL AT THE SAME TIME

POWER BI

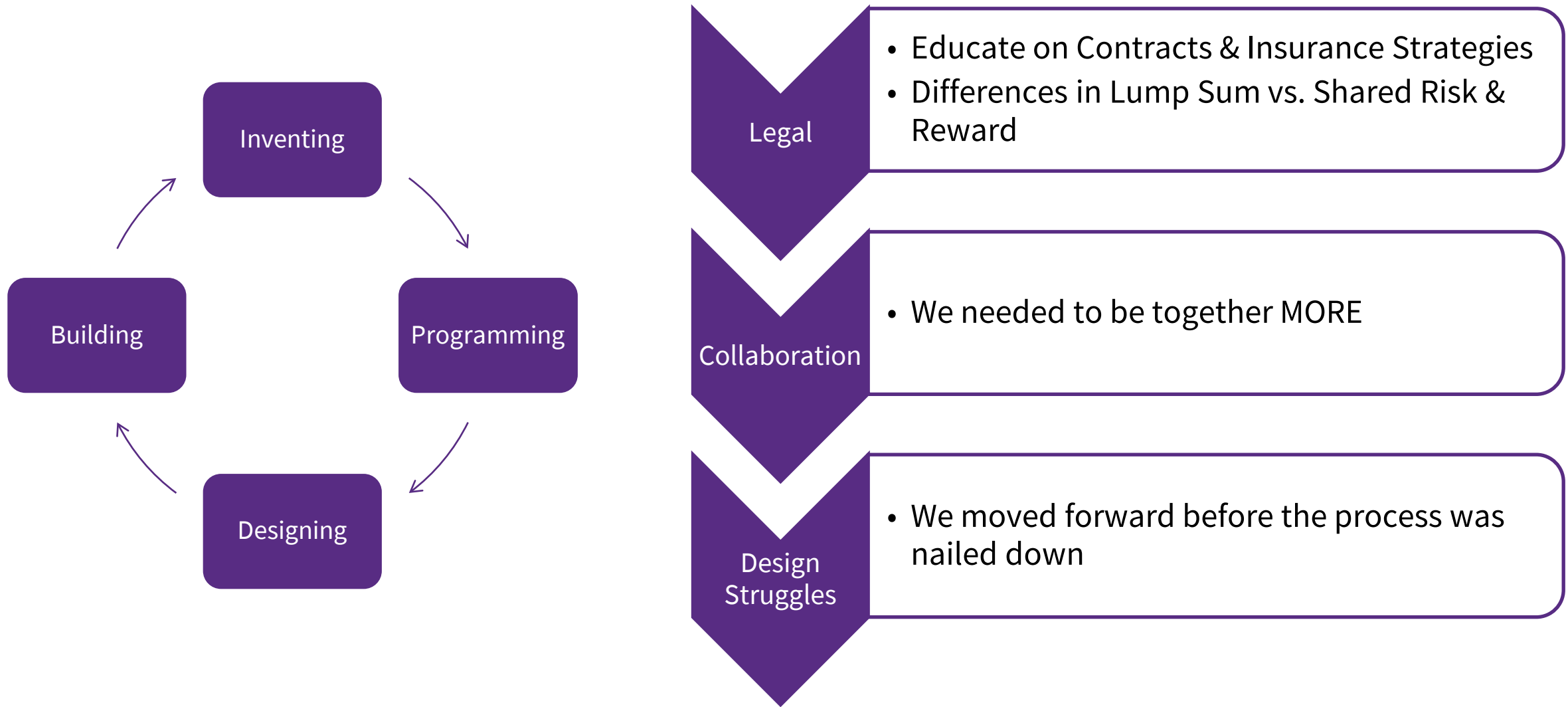


HOW DID WE GO THROUGH ESTABLISHING THE IFOA

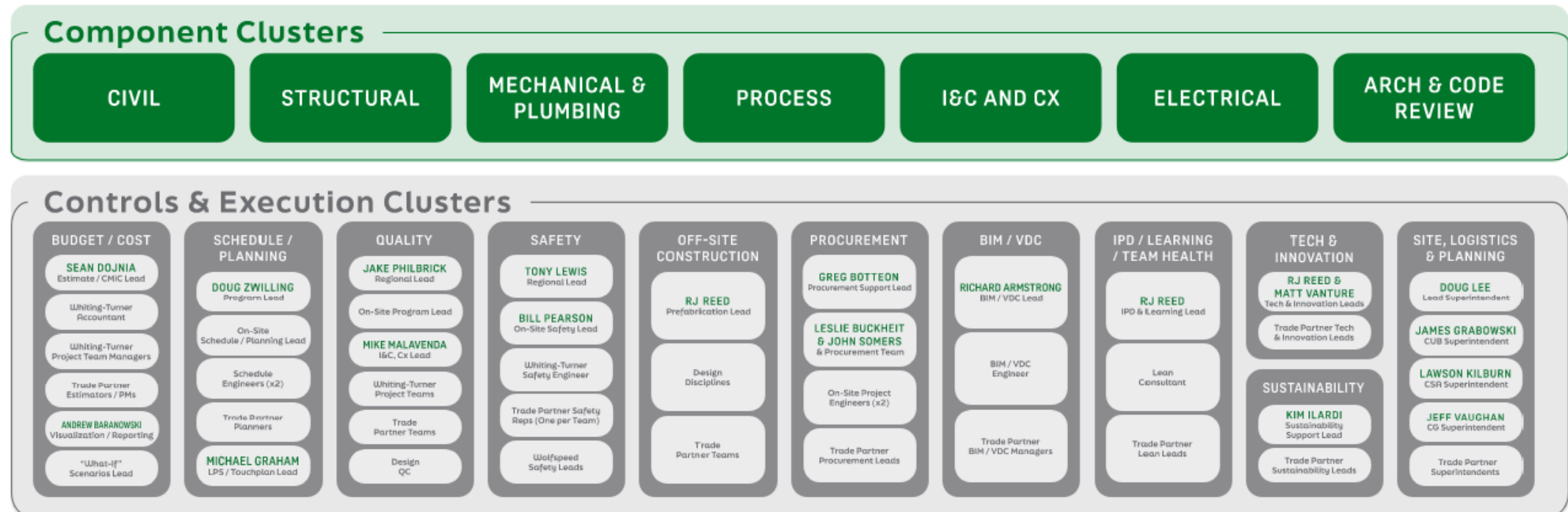


Thank You: David Stern, WSP. A wealth of knowledge from previous IPD agreements.

Lessons Learned – Be good at failing!



NEED FOR A COMMUNICATIONS TEAM – LESSONS LEARNED



COLLABORATION

Collaboration / Working Together

Keep the collaboration

Keep boosting morale and positive attitudes. I can see the fatigue of the team and it helps when their hard work is recognized.

"Keep allowing people to voice their concerns.

demonstrating a great can-do attitude under very difficult circumstances

Working together to overcome typical issues.

Communicating and doing our best to have some level of fun and enjoy our work.

Trying to get better.

Keep collaboration going, and increase the overlap.

Working well together, building the team mentality, offering to help, problem-solving- using our separate strengths to the team's advantage.

We are doing all we can with the lack of information and constant changes.

Keep bringing humor to the everyday Project SCF battle

Communication, Whiting and Turner has always been well versed in communicating their expectations.

Continue improving our communications. A lot of details are not passed to all team members.

Keep doing what we are doing.

Keep moving forward.

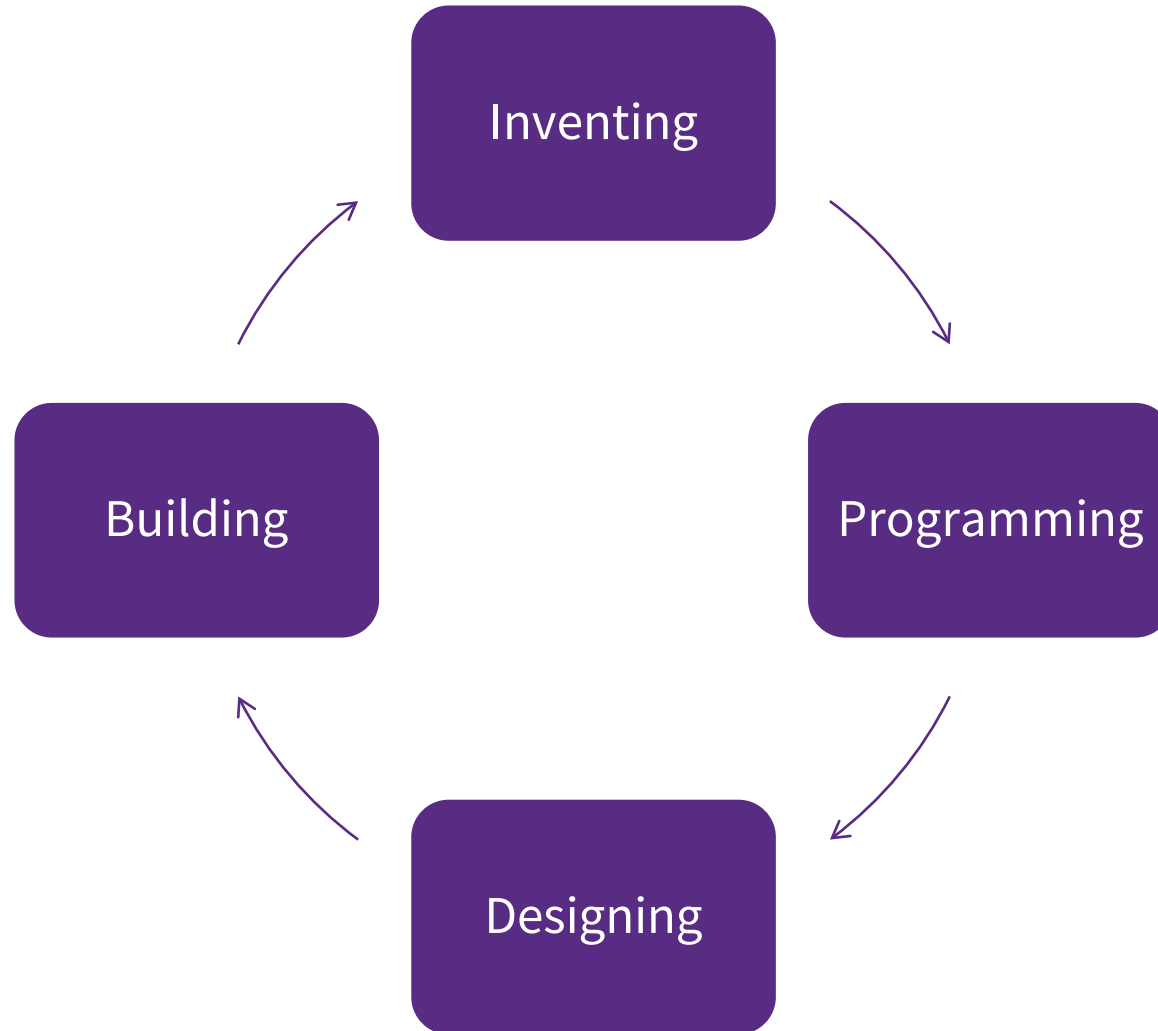
Prioritizing our efforts to meet the common goal

We should keep working together to complete the job

2023 Hibs-SCF In-Person Meeting Schedule Raleigh-Durham-Siler City, NC

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
SEP	3	4 LABOR DAY	5 F2F Design Blitz	6 F2F Design Blitz	7 F2F Design Blitz	8	9
	10	11	12 F2F Design Blitz	13 SEPTEMBER Core Group	14 BIG ROOM In Person	15	16
	17	18	19 F2F Design Blitz	20 F2F Design Blitz	21 F2F Design Blitz	22	23
	24	25	26	27	28 Big Room virtual	29	30
OCT	1	2	3 F2F	4 F2F	5 Risk Workshop	6	7
	8	9	10	11	12 Big Room virtual	13	14
	15	16	17 F2F placeholder	18 F2F placeholder	19 OCTOBER Core Group	20	21
	22	23 Quiet week	24 Quiet week	25 Quiet week	26 Quiet week	27 Quiet week	28
	29	30	31	1	2 Big Room virtual	3	4
NOV	5	6 NCDOL Signing Ceremony	7 agenda finalized for TBD F2F	8	9	10	11
	12	13	14 F2F placeholder	15 F2F placeholder	16 Nov Core Group & Top Out Ceremony	17	18
	19	20 Quiet week	21 Quiet week	22 Quiet week	23 THANKSGIVING	24 Quiet week	25
	26	27	28 Holiday Dinner Angus Barn	29	30 Big Room virtual	1	2

DESIGN CHALLENGES



- It always sounds great, but its hard and the skill set is not out in the market the way it needs to be
- Anyone that has done this practically knows the challenges and getting everyone on the same sheet of music
- 360 cam versus model for qty's
- Dedicated people and starting the conversations earlier
- One of our partners with the most IPD and EV experience has stepped up and crated an easy process for the rest of the team to follow

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EACH TRADE PARTNER REPORTS WITHIN THIS FRAMEWORK

WBS

- RESOURCE LOADED SCHEDULE
- BASILINE COST
- BIM/VDC MODEL

Breakdown by Trade / Area, and where appropriate – Grid (Sub Areas)

DEFINE KEY PERFORMANCE INDICATORS

What information will give us the insight to clearly status the project?

HOURS

Planned Hours is Normalized Unit of Work

Coordinate with P6 Schedule

PHYSICAL % COMPLETE

Reality Capture of work installed in the field

Opportunities for Automation

360 CAMERAS

ACTUAL HOURS

Expended to Date, Reported by TP

Prefab Considerations

ANALYZE & REPORT OUT

Project Health

Earned Value

SV / CPI / SPI / TCR

Visualize in Power BI

Logos: P6 ORACLE, X, NavVis, DroneDeploy, RECONSTRUCT, X, 360, Power BI

A GC'S PERSPECTIVE ON THE WOLFSPEED JOURNEY



We want our partners to take this journey with us!

DO'S

DON'TS

Willingness to be financially invested:
“Joint Risk”



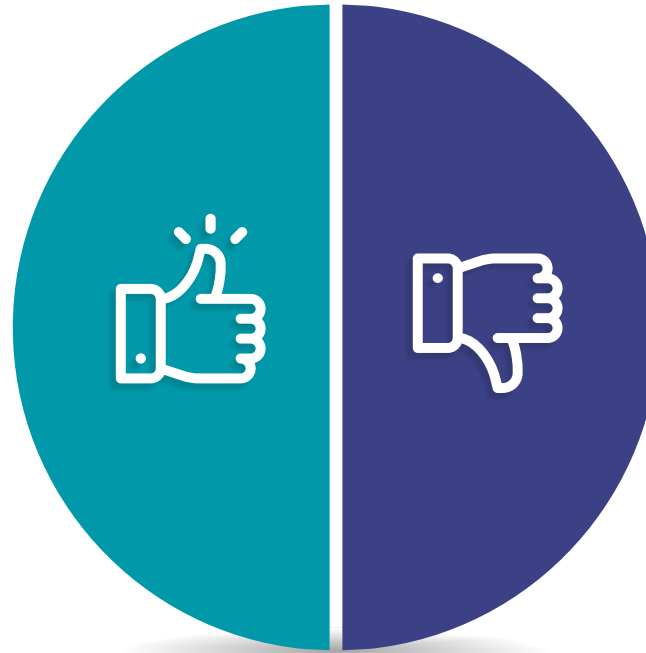
Continuous Improvement



Lasting partnerships with vendors



Transparency



Design-Bid-Build



Withhold bad news



Put your own profit first



Silo yourself from others

Key Takeaways

Things you *should* do

- **Build Alignment** with your business partners before approaching senior management is key
- **Start Small** and Build
- **Educate, Educate, Educate**
- Find & work with **like-minded partners**
- **Rely on experts** within your team
- **Be Good at Failing**

Things to *avoid* doing

- Don't underestimate the importance of **having robust communication**
- Being "too" remote – **Collaboration is better in person**
- **Assuming all parties are aligned on the schedule**

THANK YOU





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.

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Thank you for attending this presentation.
Enjoy the rest of the 25th Annual LCI Congress!