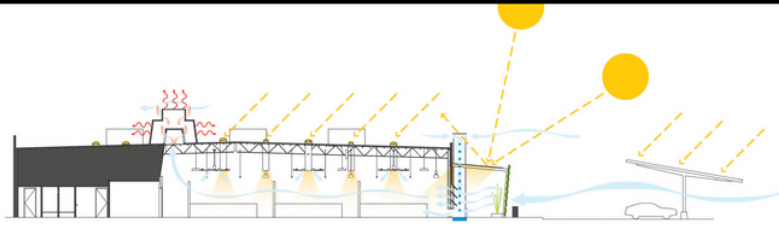




AUTODESK UNIVERSITY

INTEGRATING PROJECT DELIVERY

Dean Reed, DPR Construction | John Wiegand, Autodesk
Las Vegas, NV • November 17, 2016



Martin Fischer | Howard W. Ashcraft
Dean Reed | Atul Khanzode

Integrating Project Delivery



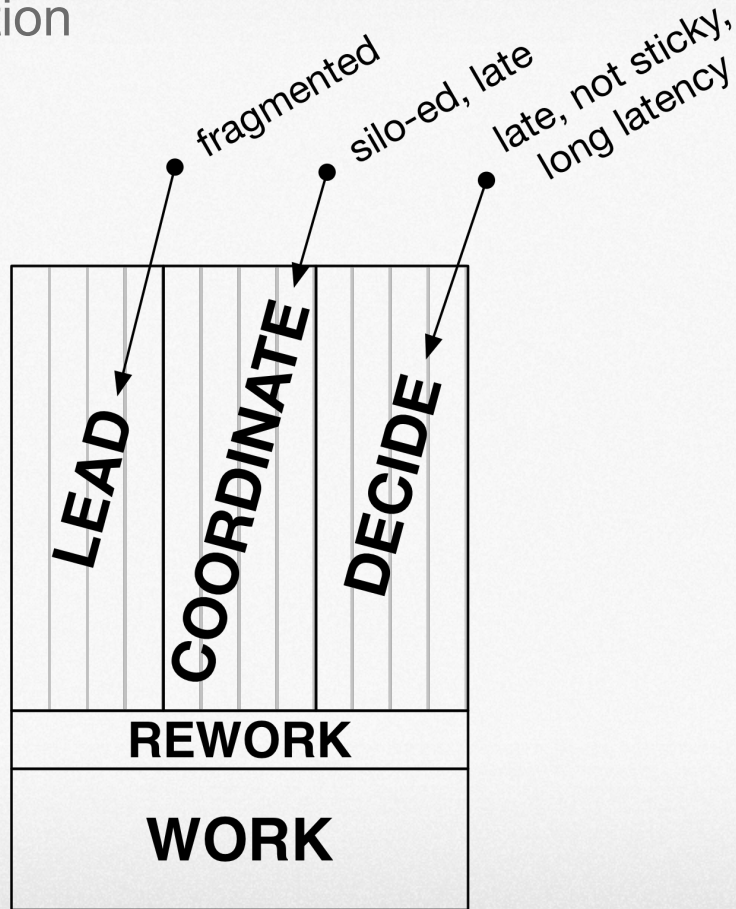
WILEY

LEARNING OBJECTIVES

1. How BIM and simulation support design for sustainable, **high performance buildings**
2. Using BIM as a foundation for **designing to performance targets** within the time and money available
3. How BIM field applications support high quality, **Lean construction**
4. Using technology to **strengthen collaboration** and integrated design

4 TASKS EVERY TEAM MUST DO

Impact of Fragmentation



SIMPLE FRAMEWORK

for Integrating Project Delivery

Value Metrics

Production
Management

Collaboration
Colocation

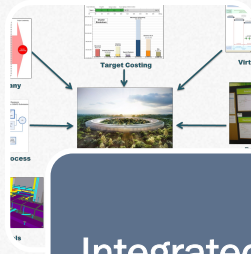
Simulation
Visualization



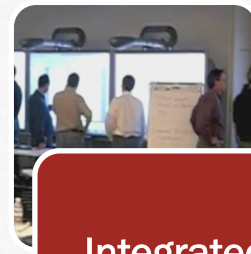
High
Performance
Building



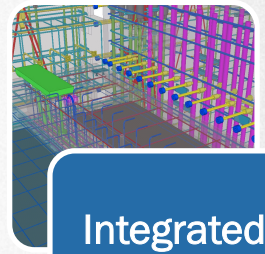
Integrated
Building
Systems



Integrated
Process



Integrated
Organization

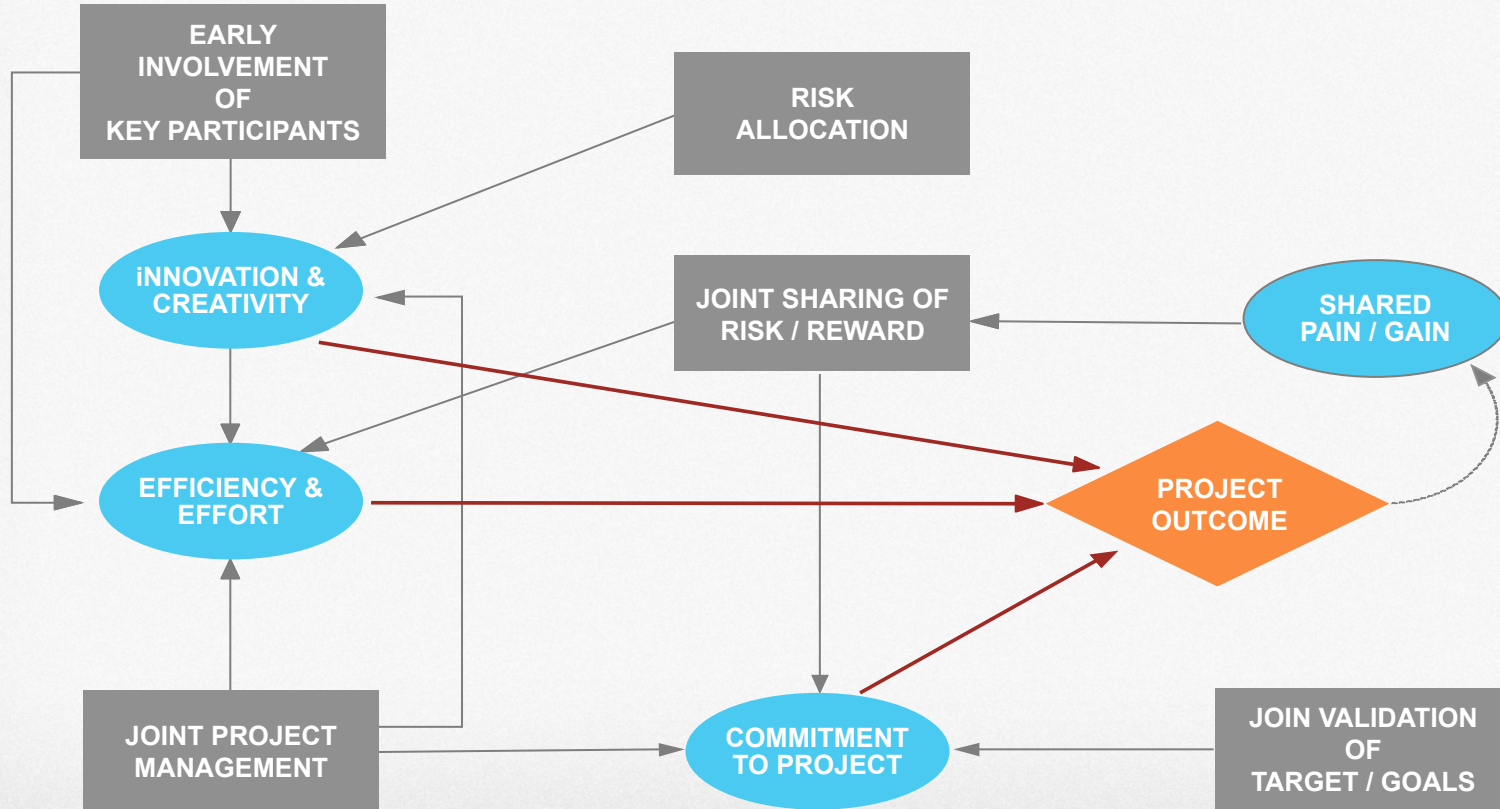


Integrated
Information
(BIM)

Agreement/Framework

AGREEMENT / STRUCTURE

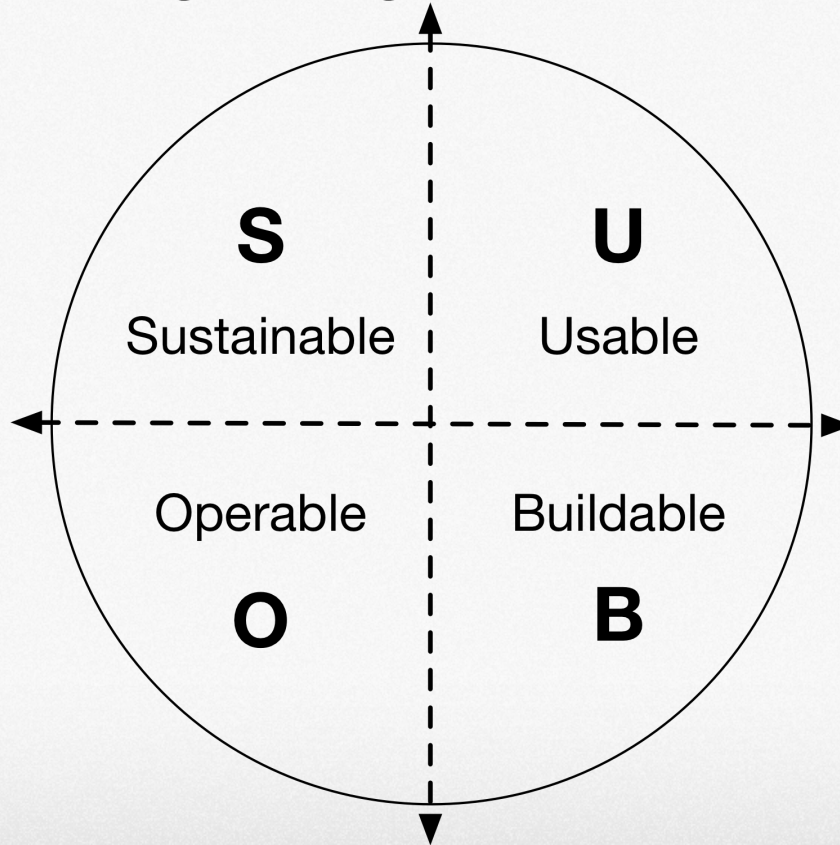
IPD Elements & Outcomes



Courtesy of Hanson Bridgett LLP

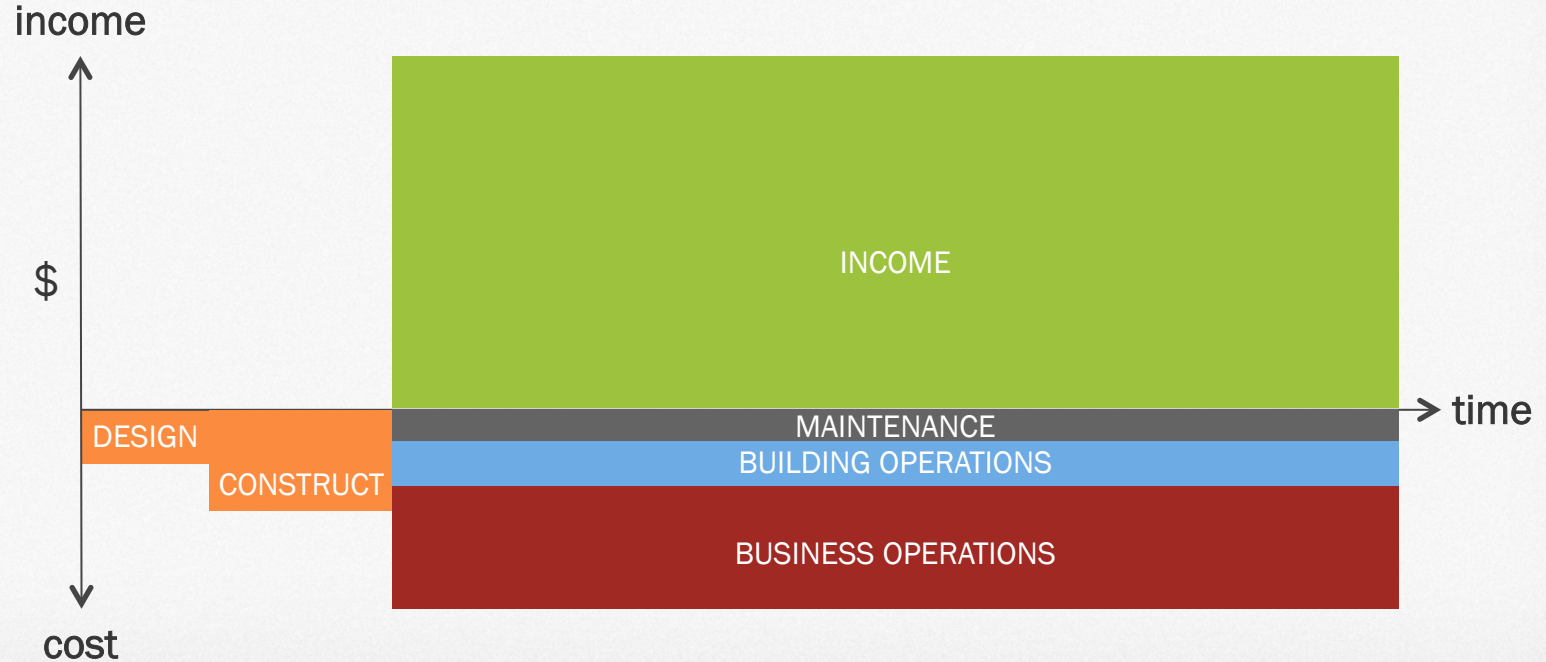
HIGH PERFORMING BUILDING CRITERIA

What Is a High Performing Building?



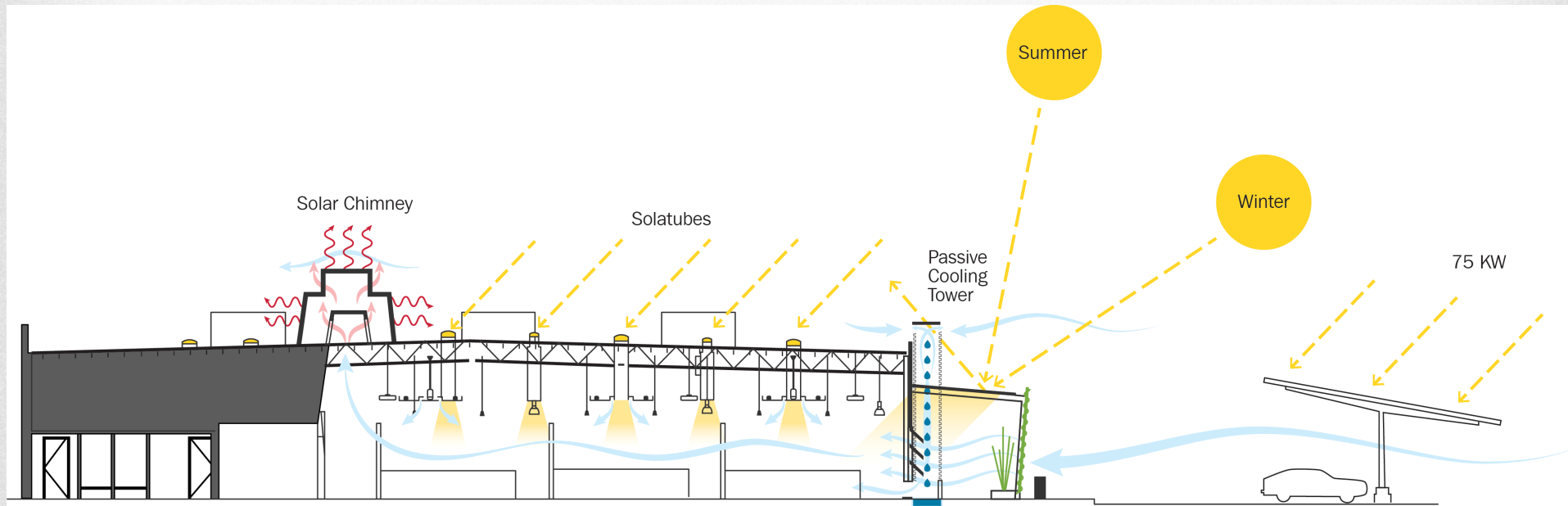
MAKING VALUE POSSIBLE

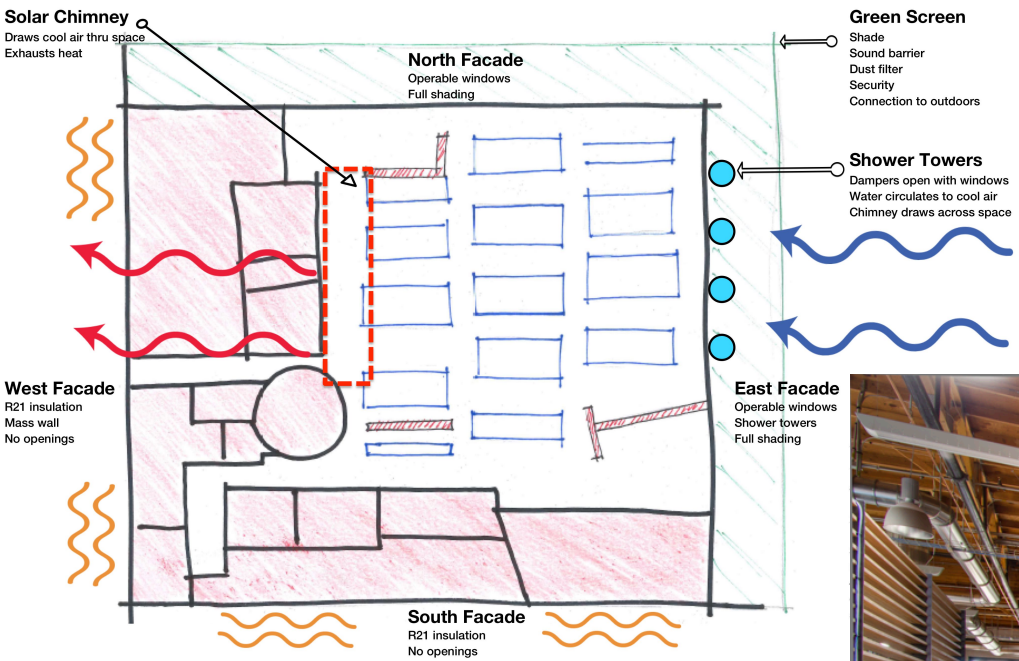
Design & Construction Enable People to Create Value



INTEGRATING SYSTEMS

To Create a High Performing Building





STRATEGY

Bioclimatic

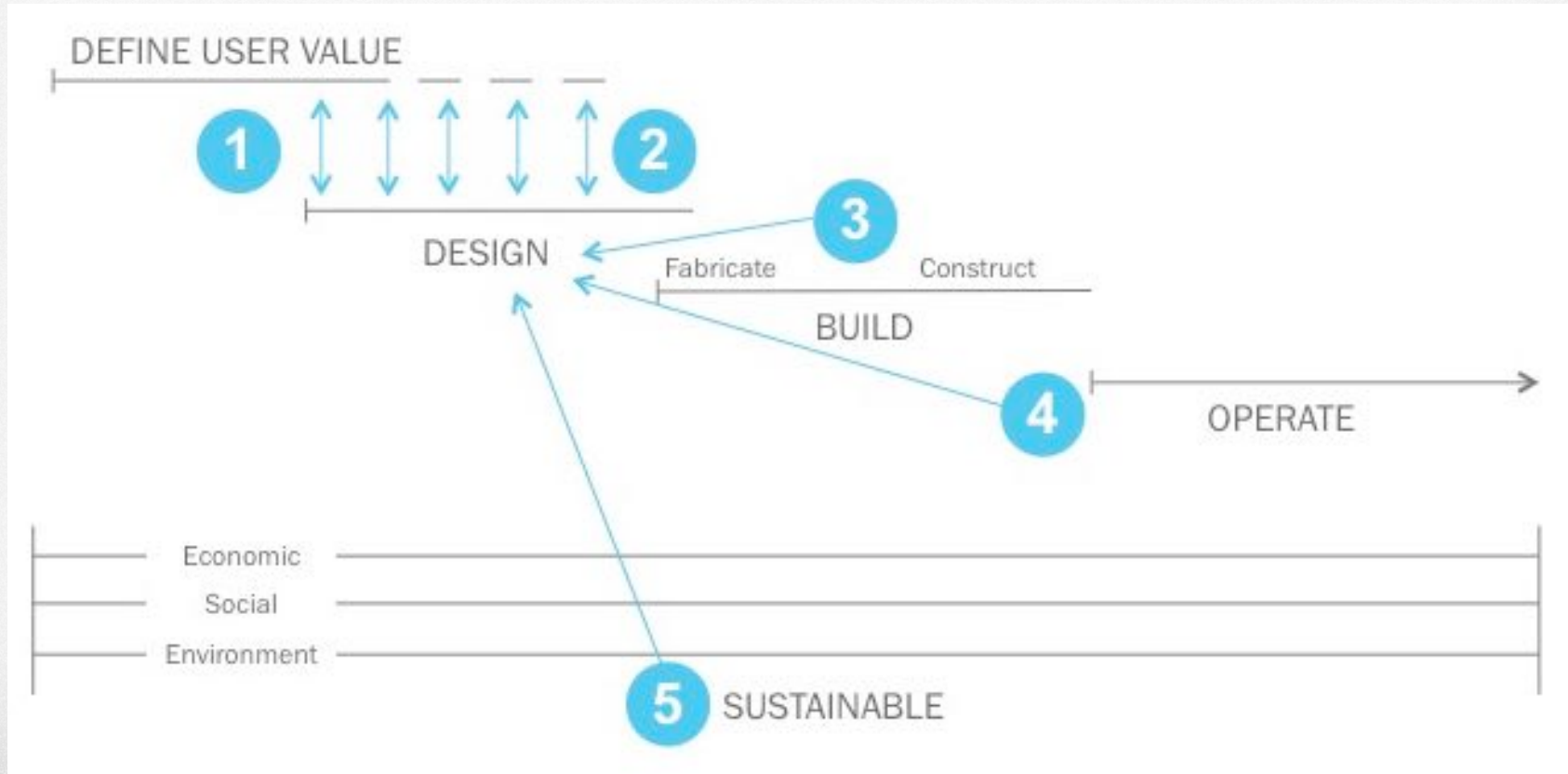
END RESULT

Value | High Performance



INTEGRATING PROCESS KNOWLEDGE

To Design a High Performing Building



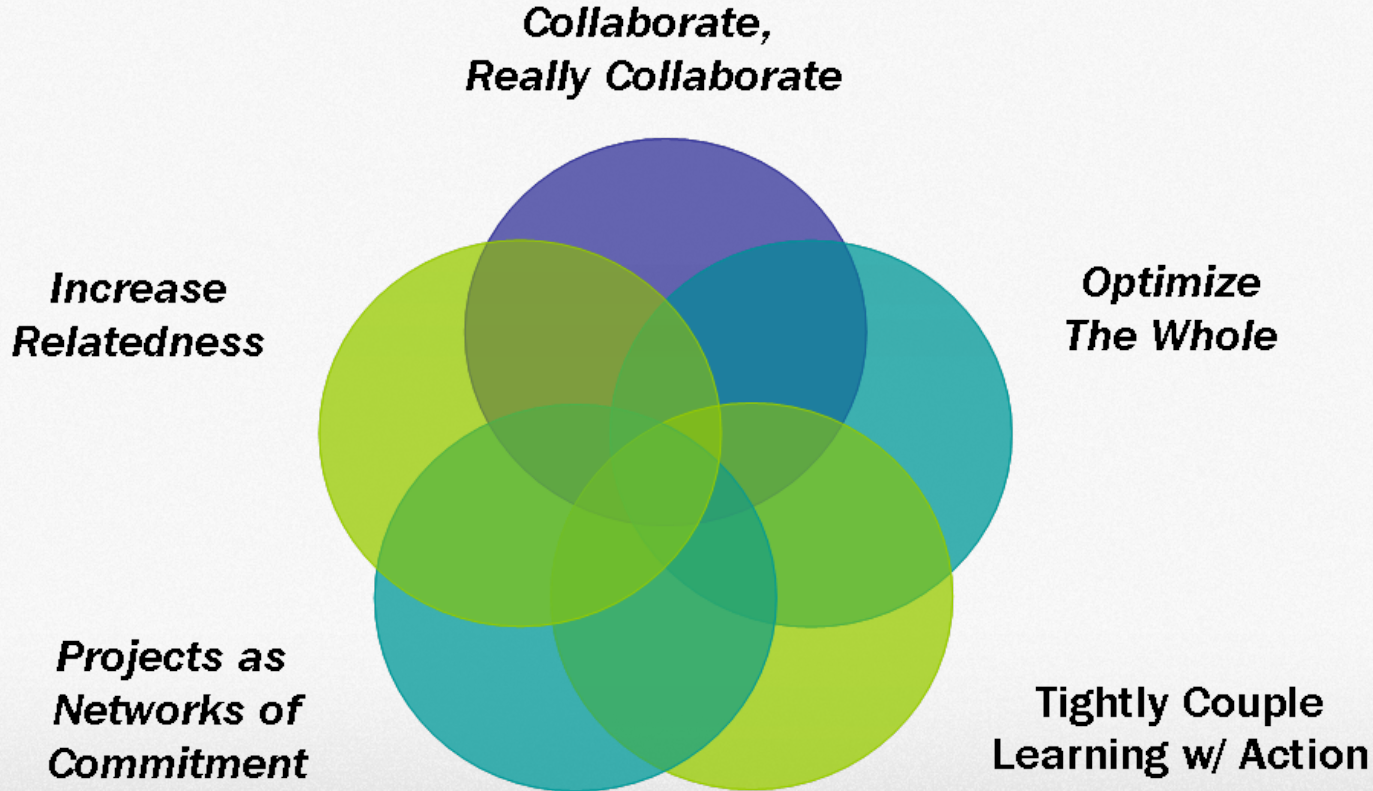
INTEGRATING PROCESS KNOWLEDGE

Collaborative Design Review Using BIM



INTEGRATING THE PROJECT ORGANIZATION

Five Big Ideas Reshaping the Design and Delivery of Capital Projects.



You Are Entering a Lean Project



THINK Differently

can you see it done differently
are you pursuing **PERFECTION** the first time
don't compromise your rules and principles

REALIZE “no problem” is a problem

LOOK at the errors in the **PROCESS** not the **PEOPLE**

BE transparent in **EVERYTHING**

IDENTIFY the forms of **WASTE** whenever you see them

WORK to better the whole, not the individual

EVERYONE is empowered to make it better

Do you have the **TOOLS**, **TIME**, and **RESOURCES** you need
You can declare “C'MON MAN!”

PLAN the work, work the **PLAN**

plan, do, check, act

SHOW things **VISUALLY** so that everyone knows where we are

TRUST your other partners

Are you in the “circle of trust”

RESPECT others time and effort as you do your own

Invite challenges without being defensive

DECLARE broken processes, promises and plans

A **PROMISE** is an element of **TRUST**

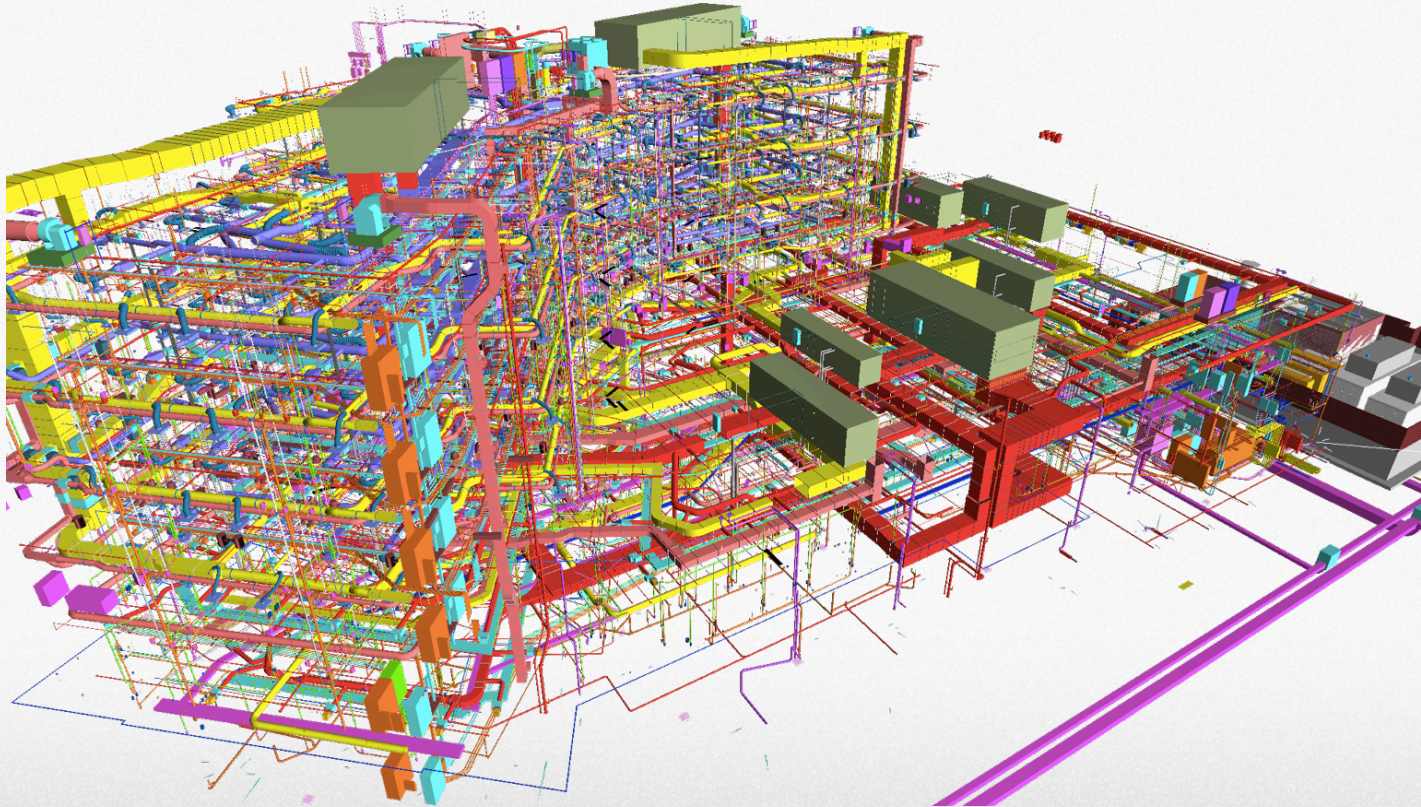
MEASURE to see how we are doing

Publish our performance for **ACCOUNTABILITY**

RECOGNIZE your mistakes, but be ready to **CORRECT** the process

INTEGRATING PROJECT INFORMATION

Integrate Scope, Quality Cost & Schedule Using BIM



INTEGRATING PROJECT INFORMATION

Enabling Learning throughout the Project Team

Building Information Modeling

Increased Level of Team Engagement

1 Visualization



2 Coordination



3 Constructability



4 Fabrication & Installation



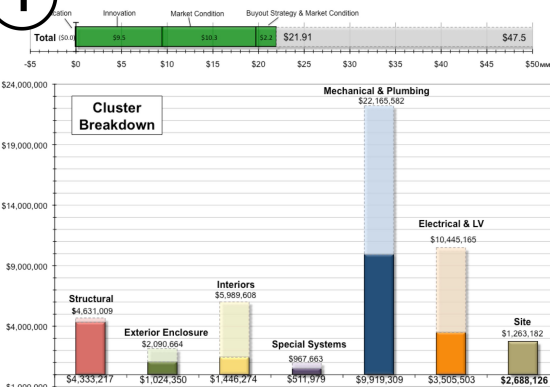
5 Whole Life Cost



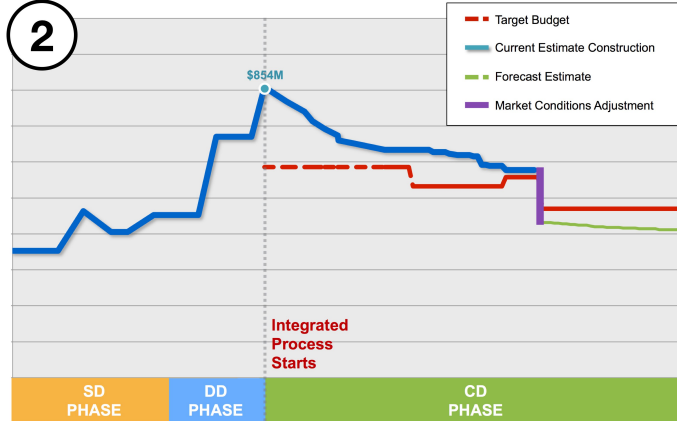
MANAGING WITH METRICS

To Improve Integrated Team Performance

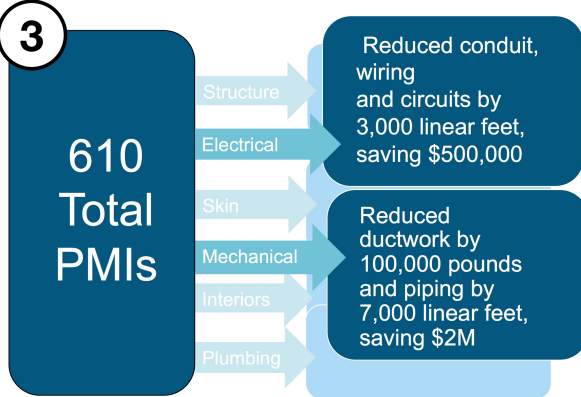
1 Bricks and Mortar: Projected Estimate progress toward Budget



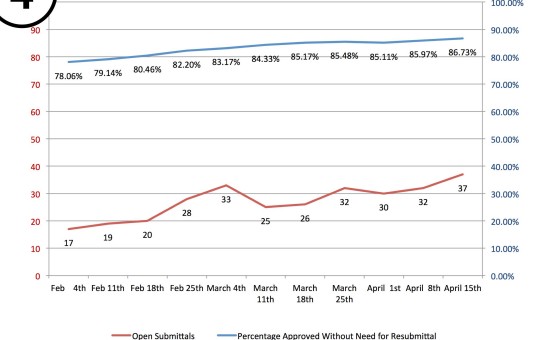
2



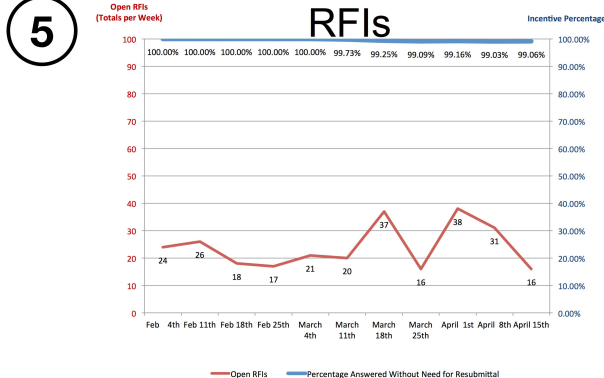
3



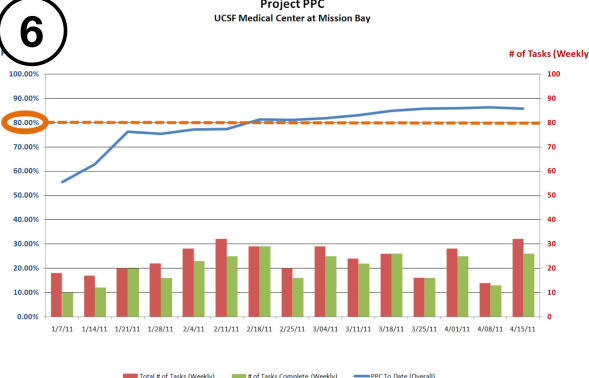
4 Submittals



5

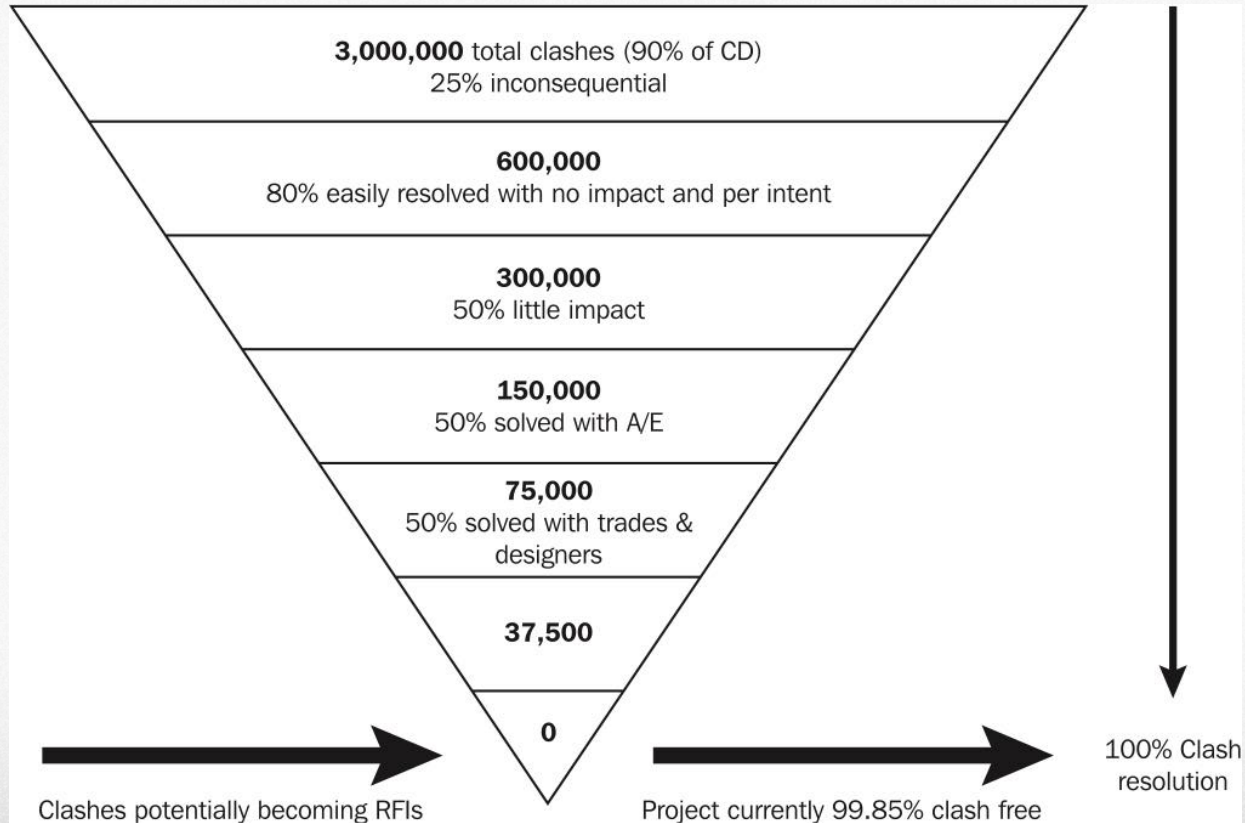


6



COORDINATION PERFORMANCE METRICS

Managing BIM Coordination with Metrics



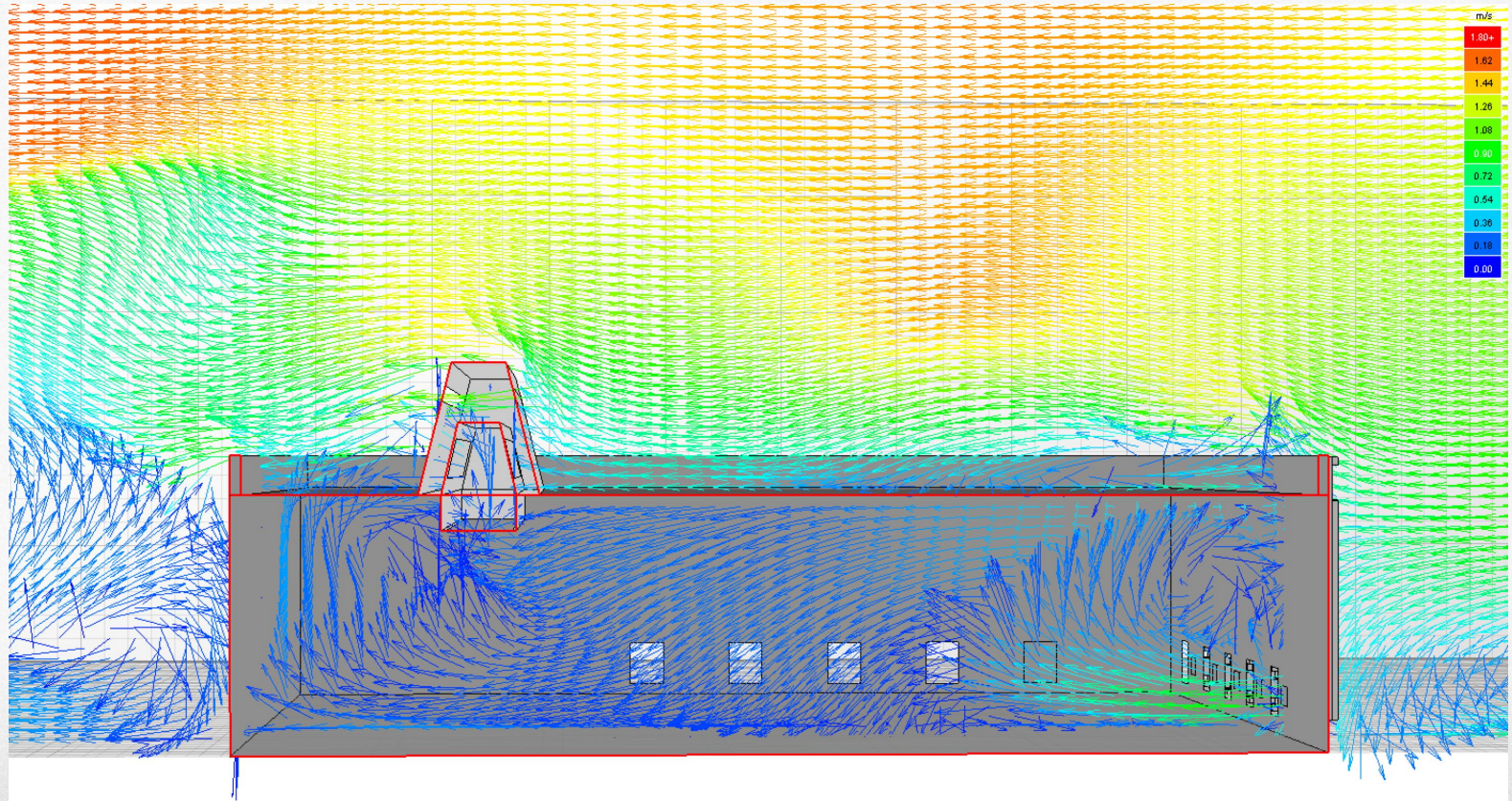
VISUALIZING BUILDING PERFORMANCE

Walk into the Future



SIMULATING BUILDING PERFORMANCE

Computational Fluid Dynamics Model of the DPR Phoenix NZE Building



COLLABORATING TO IMPROVE PERFORMANCE

For Constructability & Smarter Integrated Work Processes



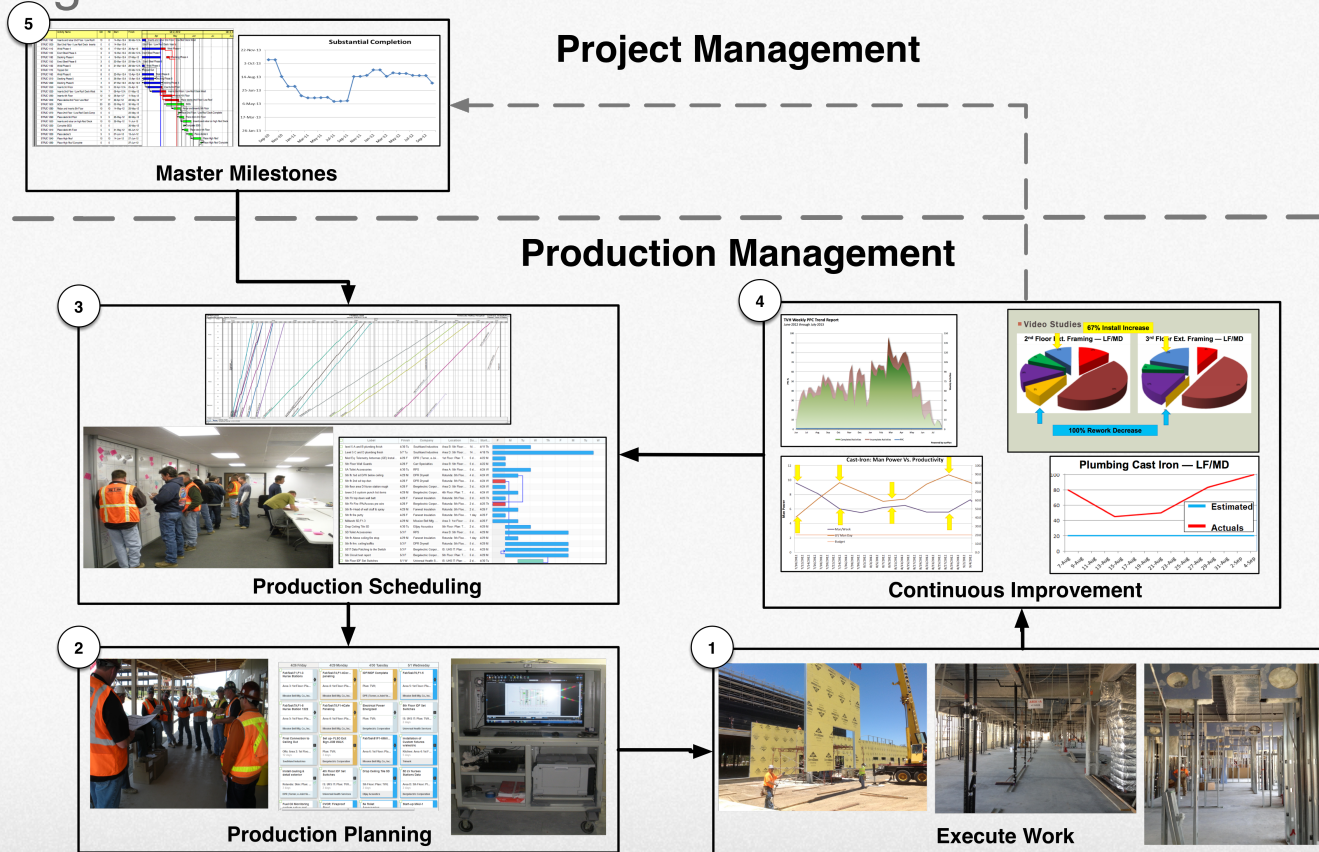
CO-LOCATING TO IMPROVE PERFORMANCE

For Better Information & Faster Decisions



MANAGING PRODUCTION

As an Integrated Team



PULL PLANNING FOR FLOW

Based on Every Crew Getting What They Need

COMPANY: _____ Card #: **3**

WHAT I NEED FROM OTHERS

Completed
Rack

DURATION: **1** START: _____ FINISH: _____

WHAT I WILL DELIVER

Deliver
Racks

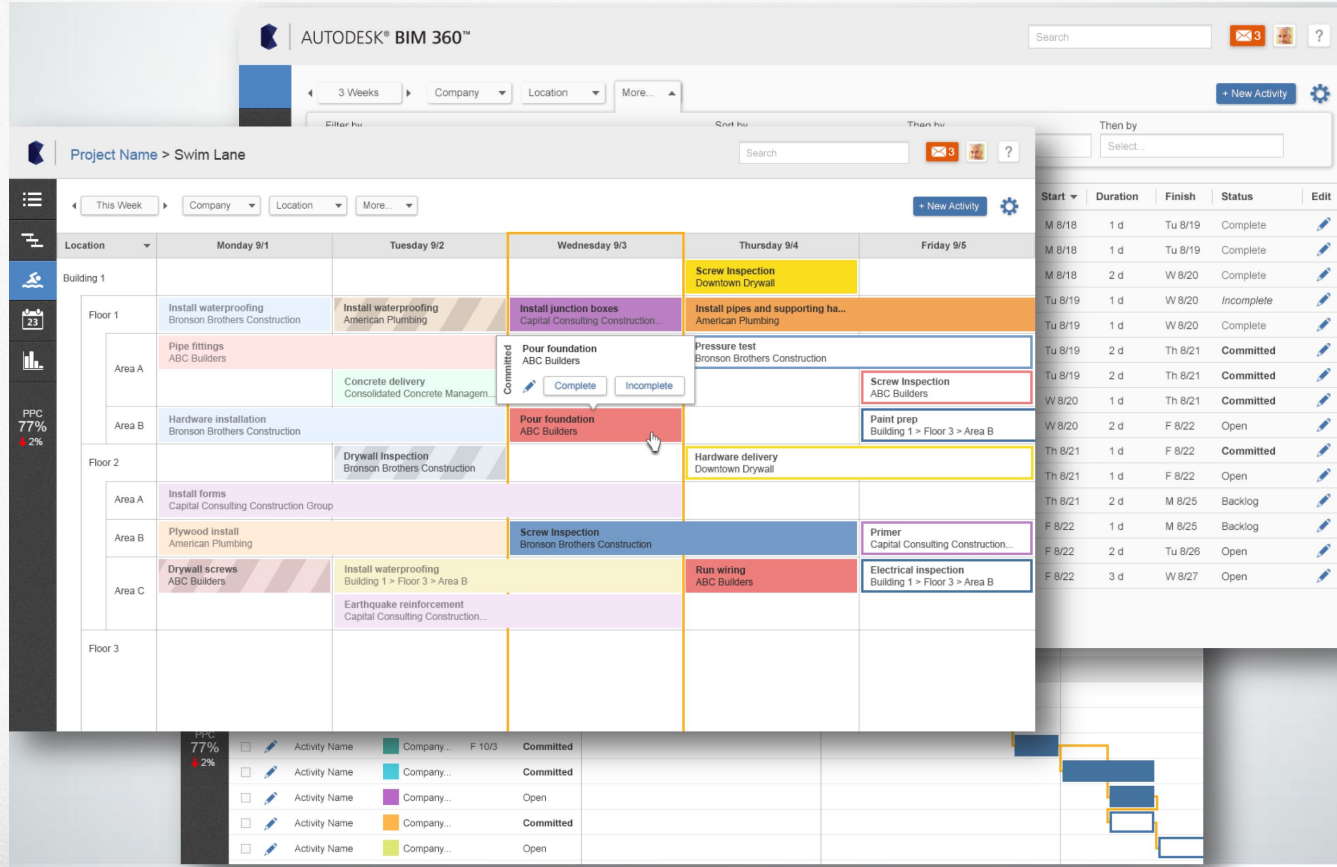
For #: _____

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PLANNING & MANAGING PRODUCTION

Tracking Outcomes to Build Trust for Collaboration



INFORMATION + VISUALIZATION AT PRODUCTION

A Carpenter Seeing the Wall He Will Be Building, Exactly Dimensioned



USING METRICS TO IMPROVE PRODUCTION

Studying Results is the Key to Continuous Improvement



June 2015

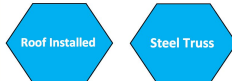
SELF-PERFORM DRYWALL DASHBOARD—SOCAL

PLAN/DO

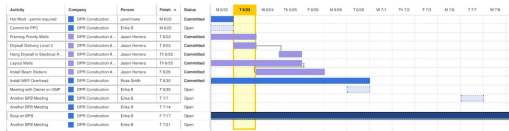
Milestones



Roadblocks / Constraints



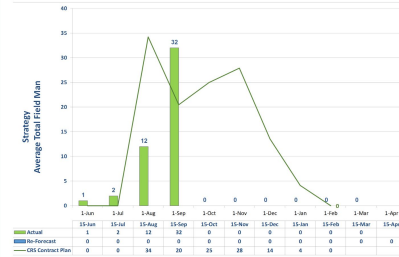
3 Week Look Ahead Plan



Weekly Work Plan

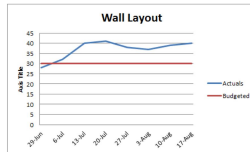
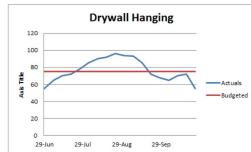
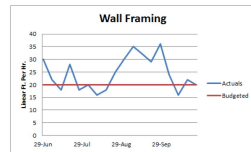


CHECK



PPC Summary

PPC test week	Prior week	Project average
100% + 10	82%	78% + 1%
Actuals test week	Prior week	Project to date
9 + 2	11	170



ADJUST

Lessons Learned

- Order materials to exact size to reduce measuring/cutting (Necessary Non-Value)
- Overtime work sequenced in congested batches of work can reduce trade stacking and increase overall productivity.
- Proactive continuous communication with trade partners on sequencing and handoffs needs to occur daily, not just in planning meetings.

