Managing Design as an Information Supply Chain

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Managing Design as an Information Supply Chain

Manage The Work (PLAN)  Manage the Content (MODEL)

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### Manage The Work (PLAN)

- Design Planning with the Last Planner System
- Milestone, Phase and Lookahead Planning
- Workplan Commitments and Maintaining Team Alignment
- Data for Team Improvement
- Managing Complexity
- Integrating Model Issues into the Plan

### Manage the Content (MODEL)

- The Goal of Design Modeling?
- Integrated Design and Coordination workflow
- Direct Digital Exchange
- Integrated Team Model Reviews
- Improving model-based workflow with Value Stream Mapping.
- Build to the Model
Collaborative Planning: What We Believe

• Projects are **dynamic systems**. The team’s understanding of what is possible evolves as their understanding of the project design improves over time.
• Workflow waste occurs as a result of **misalignment** about the **handoffs** between assignments.
• Improving the **quality of assignments** improves the chances that they actually get completed when promised.
• **Predictable uninterrupted** workflow correlates to overall efficiency.
• Conventionally constructed project schedules are static, overly detailed, assume too much too early, and prematurely attempt to accurately predict the future in great detail based on gross assumptions.
Planning with the Last Planner System

**Commitments Management**
- Complete
- Not Complete
- On Going

**Weekly Work Planning**
Teams monitor commitments to stay on track & improve

**Last Planners**
Last Planners identify and make promises of what **will** be done

**Make Ready Planning**
Regular lookahead planning identifies constraints so that work **can** be done

**Phase Schedule**
Pull Planning & Production System Design phases establish what **should** be done

**Master Schedule**

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* Last Planner is a trademark of the Lean Construction Institute

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Milestone Planning

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Standard work is identified, planned, and then repeated in different work areas.
Lookahead Planning
Workplans: Making Reliable Commitments

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Workplans: Making Reliable Commitments

- Model power controls, and conduit sleeve for Loading Dock and Trash Compactor
- Update acoustic ceilings priding per Inc 4 Permit Set package
- Review & Update the model per INQ responses
- Model Updates for Imaging Control Rooms
- Provide SE comments and SGRJR suggested responses for Inc 6 signage anchorage to KKA and HIB
- Relocate rooftop manifold @ NELS Roof (Grid L-4)
- Model no fly zones at conduit and conduit (space protection for c boxes) for cath labs (Rooms 4464, 4467, 4454, 4452)
Daily Check-In: Maintaining Team Alignment

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Rigor of the Daily Check-In

Workplan Commitments

10-15 Minute Check-In. 11:30 AM SHARP! EVERYDAY!

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Design planning is complicated.

To assist their own work Ghafari developed vPlanner, a visual planning software solution that facilitates collaborative design and construction management and is compatible with the Last Planner System.

vPlanner allows project teams to collaboratively create and manage highly detailed and dynamic networks of commitments without losing sight of their end goals and overall objectives.
Integrating Model Issues into the Plan

Evaluate and provide of shaft opening at P1 ramp at Line A

Remove rouge wall in model at FOS vents

Review detail for slab cuts in deck for parking car detection

Confirm no obstructions for Protection at vents

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Integrating Model Issues into the Plan

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The Goal of Design Modeling

- Ensure the Design that meets the Owner’s Goals, is affordable, fully coordinated, and constructible. (i.e. Ensure design is *really* finished.)

- The goal of Design is not to implement BIM... ...it is to produce a fully completed, coordinated, and constructible design.
Integrated Design + Coordination: Before

Design
- Design is issued before it is complete!

Coordination
- Coordination happens after design is issued!

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Integrated Design + Coordination: Risks

Design

Detailing/Coordination

Multiple models of the same system = Who has latest information?

Rework

Fab and Install

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Integrated Design + Coordination: Current

Integrated Design and Coordination

- Electrical
- Fire Protection
- SSA Providing Revit Model & Rihno

D/A Sub produces 3D model under direct supervision of Engineer

- CDFL Provides Single Line Design in AutoCAD
- MP Sub Will Design in AutoCAD MEP

- Design Integration in Navisworks (Ghafari)
- Collision free (fully coordinated)

Design Team issues 100% Coordinated CDs from sub-contractors 3D model.

i.e. “Completing Design During Design”

Fab and Install

Shop drawings are produced from the SAME approved and coordinated 3D model.

- Locked Down 3D Mechanical Model
- Mech Fabricator Imports into FAB Software
- Mech Fabricator Submits 3D model
- Design team confirms 3D model did not change design intent

Submit shop drawings for record

Fabrication

Installation per the coordinated model
Direct Digital Exchange Workflows

- Criteria
- 3D Model
- Fab
- Permit Drawings
- Install Drawings
- Quantities for Estimating

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Integrated Team Model Reviews

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Model-Based Workflow Improvements

Value Stream Mapping - Current State:
Design, Model and Coordination Workflow for Lighting.

Multiple Models and Design Information without a simple and clear workflow that supports model-based processes.
Model-Based Workflow Improvements

Workflow realigned for Drawing production (from 3D Design Models)
Manage the Work (PLAN)

- PLANNING DESIGN IS HARD – need leadership alignment, coaching, and team dedication for success.
- Collaborate regardless of contract structure. (find aligned goals)
- Invest in collaborative planning.
- Develop a culture of constant improvement.
- Define clear and specific design goals as a team. (Not SD, DD, CD)

Manage the Content (MODEL)

- Model Everything. (Risk)
- Clash-free does not equal coordinated & constructible.
- Look at the work while discussing the work.
- Establish workflows that support a ‘Build to the Model’ approach.
- Share incomplete information.
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Thanks! - It’s All About Teamwork.

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Questions / Discussion

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