



Lean Construction Institute

Building Knowledge in Design and Construction

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Making Data and Decisions Flow in a Big Room

Introduction to Lean Design Conference
Seattle, Washington
September 15 and 16, 2008
Presented by Bob Mauck and John Mack

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Bob Mauck Bio

- AIA, PE, VP: Virtual Design & Construction
- Lean & 3D Experiences since 198x's
- Work with global auto OEMs since 1995 on Digital Factory with key principles:
 - Lean
 - Math Based Data Exchange
 - Integrated Supply Chain
- Pivotal Book: *The Machine that Changed the World: The Story of Lean Production (when published: Toyota 1/2 the size of GM)*

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John Mack Bio

- Started career in field as a plumber in 1985
- Started AutoCAD in 1983 on version 1.6
- Moved to office in 1994 to start a detailing department
- Since 1994 have been department head and project manager for mechanical contractor
- 2008 moved to general contracting
- Hobbies are hockey and cars.

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Creating a Game Plan: Methodologies

- Tailor to the delivery approach
- Agree on team composition
- Agree on Deliverables (who, how, when)
- Apply Lean Principles: Pull Scheduling, early/frequent visibility to issues, small batch flow,
- All disciplines (trades) in model
- Early build-side input
- Agree on discipline/trade model transition

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Creating a Game Plan: Technologies

- Setup rules to play by
- Determine what hardware and software to be used
- Create a VDC process flow map for each trade
- Use of Layout tools, such as Laser Scanning and Total Station.
- Who is responsible for the lead
- Shared server for data storage
- Offsite access to data (24/7??)
- Use space protect
- Subsystem models in context

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Gathering Data

- Hard copy drawings
- Electronic drawings
- Laser Scanning
- As built measuring

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Input of New Data

- Having proper backgrounds
- Forum to share data
- Compatibility of programs
- Use of collaboration software
- Expectations of final product
- Same Level of Detail (LOD) all disciplines
- Right LOD for phase & deliverables

Run Clash Detection

- Frequency of meetings (weekly)
- Who attends
- “Power of Authority” given to attendees
- How clashes are reported
- Who compiles the model
- Expectations for fixing clashes

Fix Clashes

- **How to track corrections / responsibility**
- **When correction are due**
- **Impact on others**

Beyond Clashes

- **Clash Detection/Avoidance**
- **Space Protect/Reservation**
- **Subsystem Coordination**
- **Constructability Review**
- **Target Costing**
- **Construction Sequencing**
- **Maintenance Reviews**
- **Safety Reviews**
- **FM Transition**
- **Smart Code Checking**

Output

- Keep visual items up on wall in Big Room
- Details
- Drawings for agencies
- Drawings for installation
- Drawings for budgets
- 24/7 Access to models, drawings

Pause to Run Session

Conclusion/Summary

- Compare what happened in the workshop to opening
- Open discussion

Take Away's