Adapt or Fail
coordination in different environments
Speakers

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Agenda

- Design Coordination—Speaking the same language and removing the fear
- Trade Coordination—Best practices and serving the field
- The Overlooked—Coordination with cities, agencies and other stakeholders
- Cultural Barriers—Coordinating with different cultures and different levels of skill
Design Coordination Success
# Design Coordination Success

## APPENDIX A

**Wilshire Grand Redevelopment**
Los Angeles, CA

**Names about this metric**

<table>
<thead>
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<th>Model Context</th>
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**Level of Development (LOD) Descriptions**

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<th>LOD</th>
<th>Conceptual</th>
<th>Preliminary</th>
<th>Final</th>
<th>Constructive</th>
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<td>LOD3</td>
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**Model Element (ASTM Unified Classification)**

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<th>LOD1</th>
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**BIMForumED**

#BIMForumED
Design Coordination Success
Design Coordination Success
Consolidated Shop Drawings

Creating a template
Consolidated Shop Drawings

Consolidated PDFs
Design Coordination Planning
Design Coordination Learning
Design Coordination: Virtual Reality in Healthcare

Creating true-to-life, immersive experiences for planning with real-time changes, and giving clients tools for confident decision making.
Is BIM Enough?

• We needed to raise the understanding of planned spaces to allow clients to understand and retain the design, and improve their confidence so they would continue to interact and make quality decisions.

• 2D drawings, models, and even 3D “fly through” experiences did not work well enough to “change” how clients “saw” their design.
Coordination by Creating Experiences

Creating true to life experiences (full scale mock ups) would be very expensive or nearly impossible in current business models. The user needed to touch, move, and interact with the model to gain an operational understanding of work flow in the room before they would sign off. How do we create the experience?

Virtual reality with full scale views with tracking ability.
How We Use VR: St. Luke’s - Bi-plane Room

- **Issue:**
  - Doctor wouldn’t sign off on design because he couldn’t tell if line of sight from control room to patient was obstructed.

- **Solution:**
  - We built a virtual mock-up of the control room and imaging room to allow the doctor to move around. This included all the imaging equipment and monitor booms.

- **Take-away:**
  - The monitor arm in the imaging room obstructed line of sight from doctor to patient.
  - Set up the VR equipment and in one session got a final decision.
Issue:
- Surgeons were not sure that a 650 SF Operating Room would be large enough to work in while using a Dvinci robot.

Solution:
- We built a virtual mock-up of the Operating Room and set up on-site in the physical mock-up allowing them to see not just drawn boxes of their equipment, but a true visual representation.

Take-away:
- Several nurse techs and surgeons went through a 3-day session to set up the virtual room in various different configurations based off of procedures, and they were confident that the space was in fact large enough.
The Overlooked
Coordination with cities, agencies and other stakeholders

• Who releases work?
  • Internal team vs. External Regulatory agencies
  • We can gain efficiencies in our process but if we don’t gain efficiencies in the external process then we still have high risk

• How can we bring efficiencies to external teams
  • Bring the mountain to them…Bring the BIM
  • Facilitate communication
  • Remove the fear factor
Traditional Start-Stop Process

Disadvantages
1. City Team overwhelmed with project scope
2. Piece-meal delivery would delay sign-off
3. City Interdepartmental review bottlenecks
4. 20 city/regulatory representatives
5. Turner assumed review time of 2-3 weeks
6. Later interviews with City revealed 2-3 months

Traditional contract documents → Regulatory Agency → Multiple agencies within regulatory agency.
1. Water
2. Sewer/waste
3. Fire
4. City management

→ Water
→ Fire Department
→ Waste
→ City Team

#BIMForumED
**Advantages**

1. Less meeting
2. Real time collaboration
3. Builds confidence in team (internal/external)
4. Hosting 20 city/regulatory representatives
5. 2-3 months of time savings

**Improved Process**
Great Wolf Lodge - Collaborative Review
VDC / BIM for International Emerging Markets

AEC Challenges

- Turner Latin America Project
  - Gap between design and installation
  - No shop drawing process
  - Little to no BIM experience
Turner & Vico/Trimble Coordination Resolution Process

• Clash avoidance vs clash detection
  • Prioritize your modeling sequence - System priority structure
  • Modeling in clashes vs modeling around prioritizes scope

• Duel Model use – same model for design documents and shop drawings.
  • Design team access model during the day and back office Vico team coordinate at night
Day 28: Received sub models and ran initial clash detection

Day 35: Sprinkler main lowered to avoid several duct clashes

Day 42: Duct raised over hydronic pipes

Day 49: Engineer couldn’t attend meeting, progress stalled

Day 56: Reconfigured duct to avoid beams

Day 63: VAV Clearance switched and duct offset raised

Day 70: First location finally coordinated

Day 4: Finish Structure

Day 7: Add internal wall layout and ceiling heights

Day 8: Fixed end conditions

Day 11: Main duct runs

Day 13: Gravity and main pipe runs

Day 15: Fire protection mains

Day 17: Connections to diffusers

Day 20: Secondary ducts

Day 23: Hydronic piping

Day 36: Location fully coordinated

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# Clashes

Clash Detection Process
- Cost = Standard
- Time = 70 Days for location
- ~10,000 SF / WK

Clash Avoidance Process
- Cost = Savings (35%)
- Time = 35 Days (51%)
- ~25 to 45,000 SF / WK

Clash Detection vs Clash Avoidance
Coordinating with different cultures and different levels of skill

• Bring The Mountain…Bring The BIM
  • Understand the people culture
  • Understand the AEC culture
  • Don’t underestimate the advantage of a native speaker
  • Work hand-in-hand with someone they trust
  • Challenge and commit others where you can…
  • Where you can’t, change your workflow and educate while you build
Recap

• Design Coordination– Speaking the same language and removing the fear
• Trade Coordination– Best practices and serving the field
• The Overlooked – Coordination with cities, agencies and other stakeholders
• Cultural Barriers – Coordinating with different cultures and different levels of skill