BIM Best Practices: Case Studies

(Lessons Learned Leading to Best Practices)

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Speakers

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AECOM Design (formerly HSMM)

- Michael Deming, AIA, LEED®AP

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- Kurt Maldovan

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- Galen Hoeflinger, LEED®AP
- Brian Russell
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Case Studies: Building Types

- Courthouse
- Adjudication Facility/Office Building
- Command Training Center
- Office Building
- Lab/Office Building
- University Residence Hall

Lessons Learned:

- Aligning BIM implementation strategies with core competencies.
- Building on experience from project to project.
- Intelligent approaches to model content: taking the long view.
- Looking ahead: impact of BIM on design processes.
- Looking ahead: emerging BIM-related roles / services.

Business Model / Core Competency:

- Experts in phased renovation / modernization of occupied buildings
- High percentage of project scope / cost is HVAC, MEP, FP
- Clients place high value on:
  - historic preservation
  - quality of architectural finishes
  - minimal disturbance of occupants
- Logistical challenges typically exceed construction challenges.

Service delivery methods:

- Design-Bid-Build General Contractor
  - defined scope based on detailed design
  - accurate pricing
  - lengthy overall schedule
  - no construction expertise in design
- Design-Build
  - cost and schedule control
  - rapid mobilization
  - scope risks for logistically complex modernization projects

Service delivery methods:

- Construction Manager at Risk
  - early constructor involvement
  - scope defined early
  - accurate pricing
  - accelerated schedule
  - constructability analysis
  - construction sequence planning
  - when owner hires CM and designer simultaneously, CM at Risk is almost identical to Integrated Project Delivery.

Challenges:

- Clients naturally think of “phases” in terms of area, not building systems.
- Limited access to critical spaces for building systems design prior to turnover for construction.
- Asbestos abatement must precede all construction activity, including documentation of existing conditions.
- Maintaining continuously operational life safety systems often conflicts with “logical” construction sequence for other building systems.

Technology Strategy:

- Collaborate with any business partner using any technology to meet the needs of any client.
- Maintain client and project – not technology – focus.
- Acquire skill as needed through business relationships.

Critical information needs:

- Detailed spatial information about existing conditions (mechanical spaces) prior to turnover for construction.
- 3D building systems design.
- Integrated model of existing conditions and proposed new conditions.
- Construction sequence planning and analysis (communication) – with both client and subcontractors.
- Make all design information available in field.

Implementation strategy / pilot tests:

- Access previously inaccessible spaces prior to construction with 3D laser-scanning technology (Intelisum) at USSC.
- Provide existing conditions data to design team.
- Use data for manual construction sequence and pre-fabrication planning.
- Model construction sequence.
- Develop design-to-fabrication capability.
- Deploy tablet-PC based field ops technology (Vela Systems).

BIM Implementation:

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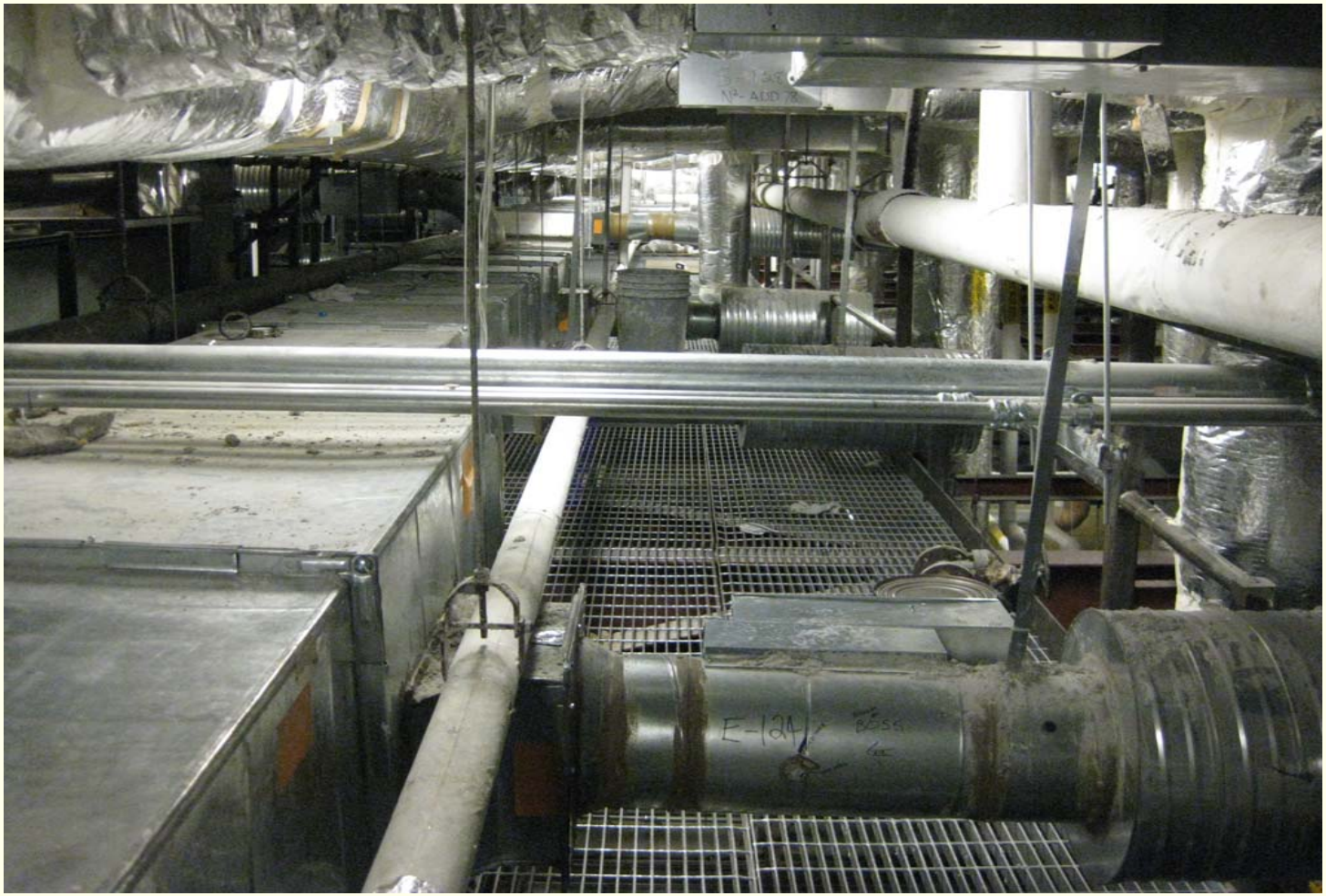
Case Study: Typical Existing Condition



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Case Study: Typical Existing Condition

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Case Study: Typical Existing Condition

Video: Pre-fabricated Bridge Project

- Completed project; not video animation.
- High-tolerance existing conditions documentation critical to pre-fabrication.
- Note construction sequence animation in lower-left corner; actual construction at full screen.