Learning to Fly as You Jump off the BIM Cliff

Mark Herman, Melissa Gorman, Scott Laoboonmi
PRESENTATION OVERVIEW

1.) Project Overview
2.) Contractual Agreements
3.) BIM through the Construction Process
4.) Lessons Learned

#BIMForumED
1.) Project Overview
2.) Contractual Agreements
3.) BIM through the Construction Process
4.) Lessons Learned
Evolution of BIM in LA Healthcare Studio

BIM Attempt #1
- Lack of training
- Inadequate hardware
- Started in BIM, then switched back to CAD

BIM Attempt #2
- Trained staff
- Upgraded hardware
- Models located at jobsite on project server

BIM Attempt #3
- Trained staff
- Put the entire team on the cloud
- Models located in a data center in New York
Single Firm Multi-Office (SFMO)
Single Firm Multi-Office (SFMO)

4 COUNTRIES

10 OFFICES
Early Strategies

- Experienced BIM Manager
- Finding the Right Team
- Provide Training
- Regular BIM Meetings
- Model Hygiene
- Archive Often
Early Strategies

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Project Timeline - Programming

- 08
- 09
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17

PROGRAMMING: 20 PEOPLE, 1 BIM USER, 6 BIM TRAINEES

BIM MANAGER 01
Project Overview

BIM Manager 01

GRUMPY
Project Timeline - Schematic Design

- **08** 20 PEOPLE, 1 BIM USER, 6 BIM TRAINEES
- **09**
- **10**
- **11**
- **12**
- **13**
- **14**
- **15**
- **16**
- **17**

PROGRAMMING

SCHEMATIC DESIGN +/- 30 PEOPLE, +/- 15 BIM USERS

BIM MANAGER 01
Project Timeline - Schematic Design Expansion

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BIM Manager 01
### Project Timeline - Design Development

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**BIM Manager 01**: [Image]

**BIM Manager 02**: [Image]

#BIMForumED
Project Timeline - Construction

08 09 10 11 12 13 14 15 16 17

- Programming: 20 people, 1 BIM user, 6 BIM trainees
- Schematic Design: +/- 30 people, +/- 15 BIM users
- Schematic Design Exp: +/- 30 people, +/- 15 BIM users
- Design Development: +/- 50 people, +/- 25 BIM users
- Construction Documents: +/- 60 people, +/- 35 BIM users
- Construction: +/- 20 people, +/- 12 BIM users

BIM Manager 01  BIM Manager 02  BIM Manager 03
Project Overview

Organization Chart

Architect

Tier 1 Consultants
- Electrical
- Mechanical
- Plumbing
- Structural

Tier 2 Consultants
- Audio Visual
- Civil
- Environmental Graphics
- Food Service
- Landscaping
- Life Safety
- Lighting Design
- Low Voltage
- Medical Equipment
- Pneumatic Tube System
- Security
- Vertical Transportation

Consultants in BIM
Consultants in CAD
Project Overview

Medical Campus

#BIMForumED
Area of Work

12.8 ACRES
Five Projects

1.  
2.  
3.  
4.  
5.
1. Make-Ready Loading Dock

- Make Ready Loading Dock
- 2 Stories, 2,700 sf
- 1 Volume, 109 pages
2. Central Plant

Central Plant
2 Stories, 40,000 sf
2 Volumes, 517 pages

1. Make Ready Loading Dock
2 Stories, 2,700 sf
1 Volume, 109 pages
3. New Bed Tower

- New Bed Tower
- 12 Stories, 510,000 sf
- 10 Packages
- 24 Volumes, 3,547 pages

2. Central Plant
- 2 Stories, 40,000 sf
- 2 Volumes, 517 pages

1. Make Ready Loading Dock
- 2 Stories, 2,700 sf
- 1 Volume, 109 pages
4. Kitchen Renovation

3. New Bed Tower
   12 Stories, 510,000 sf
   10 Packages
   24 Volumes, 3,547 pages

2. Central Plant
   2 Stories, 40,000 sf
   2 Volumes, 517 pages

1. Make Ready Loading Dock
   2 Stories, 2,700 sf
   1 Volume, 109 pages

4. Kitchen Renovation
   2 Stories, 21,000 sf
   5 Phases
   4 Volumes, 726 pages
5. Existing Hospital Renovation

3.
- New Bed Tower
  - 12 Stories, 510,000 sf
  - 10 Packages
  - 24 Volumes, 3,547 pages

4.
- Kitchen Renovation
  - 2 Stories, 21,000 sf
  - 5 Phases
  - 4 Volumes, 726 pages

5.
- Existing Hospital Renovation
  - 3 Stories, 60,000 sf
  - 4 Phases
  - 6 Volumes, 1,018 pages

1.
- Make Ready Loading Dock
  - 2 Stories, 2,700 sf
  - 1 Volume, 109 pages

#BIMForumED
Project Information

5 BUILDINGS

- New bed tower architecture and structure
- Central plant structure and mechanical electrical plumbing
- Existing Reno architecture equipment and mechanical electrical plumbing
- Kitchen Reno architecture mechanical electrical plumbing
- Loading dock architecture mechanical electrical plumbing
Project Information

5 BUILDINGS

633,700 TOTAL SF
Project Information

5 BUILDINGS
633,700 TOTAL SF

31 MODELS

new bed tower
architecture
core & shell
turn & equip
equipment
structure
mechanical
electrical
plumbing

existing reno
architecture
furn & equip
equipment
structure
mechanical
electrical
plumbing

kitchen reno
architecture
structure
mechanical
electrical
plumbing

mr-loading dock
architecture
structure
mechanical
electrical
plumbing

central plant
architecture
structure
mechanical
electrical
plumbing

#BIMForumED
5 BUILDINGS
633,700 TOTAL SF
31 MODELS
37 VOLUMES
Project Information

5 BUILDINGS
633,700 TOTAL SF
31 MODELS
37 VOLUMES

5,919 SHEETS
Project Overview

Project Information

- 5 BUILDINGS
- 633,700 TOTAL SF
- 31 MODELS
- 37 VOLUMES
- 5,919 SHEETS
- 29 PERMITS
Office of Statewide Health Planning and Development (OSHPD)

The purpose of OSHPD’s Facilities Development Division is to regulate the design and construction of healthcare facilities to ensure they are safe and capable of providing services to the public.

- Plan Review
  - Construction Documents
  - Change Orders
  - Deferred Approvals

- Construction Observation
1.) Project Overview

2.) Contractual Agreements

3.) BIM through the Construction Process

4.) Lessons Learned
Project Timeline in relation to BIM in the AEC Industry
Project Timeline in relation to BIM in the AEC Industry

- **AIA E201-2007**
- **AIA E202-2008**
- **BIMForum LOD development begins**
- **BIMForum LOD Specification 2013**
- **BIMForum LOD Specification 2014**

#BIMForumED
Project Timeline in relation to BIM in the AEC Industry

- **AIA E201-2007**
- **AIA E202-2008**
- BIMForum LOD development begins
- **AIA E203-2013**
- **AIA G201-2013**
- **AIA G202-2013**
- BIMForum LOD Specification 2013
- BIMForum LOD Specification 2014

#BIMForumED
Project Timeline in relation to BIM in the AEC Industry

AIA E201-2007
AIA E202
BIMForum LOD development begins
AIA E203-2013
G201-2013
G202-2013
BIMForum LOD Specification 2013

#BIMForumED
Contractual Agreements

Contracts and Model Usage

AIA Project Building Information

PROJECT: (Name and address)

PROTOCOL VERSION NUMBER:
DATE:
PREPARED BY:
DISTRIBUTION TO: (List each individual individuals listed in Section 1.1, or refer recipients.)

#BIMForumED
Contractual Agreements

Contracts and Model Usage
Contractual Agreements

Contracts and Model Usage

• Acknowledge that **we are still learning**

  We are all learning as we go. With each project we learn more. But BIM requires us to stick to the same model for the entirety. We are tied to the decisions we make early on.

• Compared to hand drawing or AutoCAD ever did **BIM requires far more up front strategy**

  And that strategy must be understood by everyone on the team, from those in contract negotiations, to everyone working on the team.
1.) Project Overview

2.) Contractual Agreements

3.) BIM through the Construction Process

4.) Lessons Learned
Improving Team Communication

- video conferencing
- intra-office messaging
- protocol handbook
- team meetings

≡ a culture of communication
Example 1: Casework Supplemental Package
Example 1: Casework Supplemental Package
Example 1: Casework Supplemental Package

architecture
- interior
  - core & shell
  - furniture
  - equipment
  - structure
  - mechanical
  - electrical
  - plumbing

casework
- interior duplicate
Example 1: Casework Supplemental Package

architecture

interior

core & shell

furniture

equipment

structure

mechanical

electrical

plumbing

casework

interior duplicate
Example 1: Casework Supplemental Package

architecture

- interior - excluding casework
  - core & shell
  - furniture
  - equipment
  - structure
  - mechanical
  - electrical
  - plumbing

casework

- casework sheets
Example 1: Casework Supplemental Package

- Sheet must be updated
- Transfer changes and clouds to this sheet from casework supplemental model
- After changes are transferred, please remove this note before printing
- Any questions - see Melissa (LA) or Ellen (SD)
Example 1: Casework Supplemental Package

- video conferencing
- intra-office messaging
- protocol handbook
- team meetings
- in-model directives
- extra-model worksheets

== a culture of collaboration
Example 2: Full Build Out
Example 2: Full Build Out

Office of Statewide Health Planning and Development
## Example 2: Full Build Out

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[Diagram of a building plan with annotations and issue numbers]
Example 2: Full Build Out

- video conferencing
- intra-office messaging
- protocol handbook
- team meetings
- in-model management
- extra-model spreadsheets & database

== a culture of accountability
Lessons Learned

1.) Project Overview

2.) Contractual Agreements

3.) BIM through the Construction Process

4.) Lessons Learned
Lessons Learned

• We are still **learning**

• BIM success requires **up front strategy**

• BIM success requires **consensus**

• BIM success requires **communication**

• BIM is **10% software, 90% psychology**
Presenters

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