BIM 360: Facilitating Collaboration Between Architect and Contractor

Christina Holden | Hastings Architecture
Randy Christiansen | Layton Construction
About the speaker

Christina Holden   AIA, NCARB, LEED AP
Hastings Architecture | BIM Director

• 13 years in the industry
• Responsible for the continued advancement of
design, visualization, documentation, and construction
coordination capabilities
• create + implement BIM best practices
• firm-wide efficiency + quality of drawings
• quality control of Revit projects
• curation, assistance, + maintenance of officewide BIM standard
About the speaker

Randy Christiansen, LEED AP
Layton Construction | BIM Manager

• 12 years working in the construction industry
  • Field laborer
  • Assistant Superintendent
  • Started the “BIM Dept.” of one for a regional contractor
  • Estimator/Scheduler
  • Project Manager
• BIM Manger at Layton Construction in Nashville since January 2018
• Passion for construction, problem solving, promoting jobsite efficiency, + achieving the highest quality for clients
Technology Adoption

1996
- First Server
- AutoCAD Release 12
- Tested first BIM program: Revit Version 3.1

1997
- BIM Project: Autodesk Revit Building 8.1
- Robotic total stations put into use
- 3D Printer
- Virtual Reality

2001
- CMiC is adopted as an integrated PM/ERP solution

2002
- Trimble data collectors used with total stations

2003
- Term and concept of BIM is first used

2006
- Vela Systems is initially used
- CMiC is adopted as an integrated PM/ERP solution
- First time a 4D schedule is used in a pursuit

2008
- First use of renderings in a pursuit

2010
- First use of 3D printing for project pursuit

2013
- Prefabricated Modules or Pods are first used

2014
- First laser scan performed by third party

2016
- AR/VR mock-ups

2017
- Pilot user of Autodesk’s IQ (Machine Learning/AI)

2018
- BeckTech’s model based estimating software

HASTINGS
• Private Research University
• Founded in 1873
• 12,600 students
• 330-acre campus 1.5 miles from downtown
• The campus itself is a national arboretum and features over 300 different species of trees and shrubs
Residential Colleges

At Vanderbilt, Residential Colleges integrate living and learning for undergraduate students, bringing them into diverse vibrant communities to live alongside faculty and graduate students, who become mentors as well as neighbors. They are a tight-knit community where students study, dine, socialize, and collaborate.

- 38 Residence Halls and apartments
- 6,805 full-time Undergraduate students
- 90% of Undergrad students housed on campus
Residential Colleges Master Plan
PHASE 2
RC-A

PHASE 3
RC-B

PHASE 4
RC-C

PHASE 1
BRONSON HALL

Residential Colleges Master Plan
Let’s just do it the same way we’ve always done it....
<table>
<thead>
<tr>
<th>SCHEMATIC DESIGN</th>
<th>DESIGN DEVELOPMENT</th>
<th>CONSTRUCTION DOCUMENTS</th>
<th>PRE-CONSTRUCTION</th>
<th>CONSTRUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIM 360 TEAM</strong></td>
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</tbody>
</table>
BIM 360 TEAM: BRONSON HALL

HASTINGS

DAVID M. SCHWARZ ARCHITECTS

20 team members
BIM 360 TEAM: BRONSON HALL
Unable to connect to the Internet

Google Chrome can't display the webpage because your computer isn't connected to the Internet.
### CHALLENGES

**Health Dashboard**

Oct 24, 2018 6:35:24AM PDT

View current status and upcoming maintenance schedule for the Autodesk Cloud Services

<table>
<thead>
<tr>
<th>Cloud Services</th>
<th>Status</th>
<th>Note</th>
<th>Upcoming Maintenance (PDT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A360</td>
<td>✓</td>
<td>Currently working as expected</td>
<td>No scheduled maintenance</td>
</tr>
<tr>
<td>AutoCAD 360</td>
<td>✓</td>
<td>Currently working as expected</td>
<td>No scheduled maintenance</td>
</tr>
<tr>
<td>AutoCAD Web</td>
<td>✓</td>
<td>Currently working as expected</td>
<td>No scheduled maintenance</td>
</tr>
</tbody>
</table>

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Dear Christina Holden,

We’ve confirmed that all systems are back to normal as of 10:00AM EDT.

To provide feedback please see this forum.

- BIM 360 Team projects
  - Model Open - Online
  - Sync with Central - Online
  - Intiate Collaboration - Online
  - Publishing - Online
- BIM 360 Document Management projects
  - Model Open - Online
  - Sync with Central - Online
  - Intiate Collaboration - Online
  - Publishing - Online

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How much time can BIM 360 save your team?

52 MODEL EXCHANGES
× 1.5 HOURS
× $100 PER HOUR

$7,800
BIM 360 TEAM: RC-A
Revit to Reality

WINDOW TYPE AA4
1/2" = 1'-0"
Revit to Reality
**DOCS** is the “Go To” for the latest:
- PDF drawings and ASI’s
- Specs
- Revit files

**GLUE** is the central repository for all BIM coordination files.
Design/Assist – Pre-Construction

- Construction team reviewed 75% and 95% drawings
- Markups/comments tracked in a Bluebeam Revu Studio Session

- Markups/comments exported to Excel Spreadsheet and sent to design team with PDF drawings
Design/Assist – Pre-Construction

- Design models were also used for review and verification of design intent
- Assemble Systems used for estimating
Design/Assist – Early Construction

• 2018 Project Timeline
  o January – Demolition/excavation begins
  o March – BIM Coordination begins
  o May – 100% Construction drawings issued

• Construction Schedule Demands
  o To meet project deadlines, construction had to begin well before final CD’s
  o Foundation package issued early for permits and construction
  o BIM coordination began early for underground and basement
### Design/Assist – Early Construction

- Coordination Meetings included design team in person for Q&A in addition to BIM Coordination with trades
- Excel spreadsheet used to track MEP questions
- Navisworks viewpoints helped to quickly navigate to the question areas during meetings
Design/Assist –
Early Construction
BIM 360 DESIGN: RC-B

HASTINGS

DAVID M. SCHWARZ ARCHITECTS

SSR
EMC
STRUCTURAL ENGINEERS, P.C.

PORTER KNOWLEDGE CONSULTING

Layton
R.C. MATTHEWS CONTRACTOR

47 team members
BIM 360 DESIGN: RC-B

- Plan Management
  - Construction Documents
  - Design Development
  - Schematic Design

- Project Files
  - Architecture
    - Consumed
    - Interiors
    - Shell
    - Interior HAA - not linked
  - MEP
  - Shared
    - Architecture
    - MEP
    - Structural
  - Structural

- Design Collaboration
  - MEP
  - Structure
  - Architecture
  - July
  - August
  - September
  - 07/12/2018
LOOKING TO THE FUTURE

Facilitating Lean Communication

• Be open, avoid the “Silo Effect”
• Eliminate the information bottlenecks
• Simplify the material
• Reduce duplicated efforts to convey information
  o GC/Subcontractor takes valuable time to put together and submit a question
  o Reduce time for the architect/engineer to research the question by having marked up drawings, 3D views, links to model viewpoints bundled together
• Project information needs to be readily available and easy to search
LOOKING TO THE FUTURE

BIM 360 – Priority Suggestions

• Cloud collaboration with live updates and tracking
• Expand Issue tracking features
• Link directly to drawings
• Link directly to 3D views in Glue/Model Coordination
• Ability to share/link files between BIM 360 projects
• Enhanced Set management
• Improve drawing navigation
• Add sheet index in viewing pane
• Full Docs desktop application for local file viewing
BIM 360 Resources

- Purchasing BIM 360 Design
- Assigning Access to BIM 360 Design (within the Autodesk Account)
- BIM 360 Account Administration
- Project Creation and Administration
- Service Activation
- Document Management
- Design Collaboration

BIM 360 Forum
https://forums.autodesk.com

What’s New & What’s Next BIM 360 Monthly Webinar
https://bim360hub.autodesk.com/webinars

BIM 360 Roadmap
Hey y'all....drop us a line

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Don’t forget your survey!