BIM Coordination: Run the Job, Don’t let the Job Run You

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Description
In this class, we will focus on best practices for performing successful BIM (Building Information Modeling) coordination. We will identify some of the challenges from a general contractor’s point of view and the importance of why the general contractor should lead the coordination effort. In the class, we will go over our coordination process from kick off to coordination drawings. We will give examples of BIM execution plans, and other documents needed when starting coordination. We will briefly open Navisworks software to take a look at how we set up our projects and clashes. We will also take a look at some other coordination options, and why we chose Navisworks as ours. Along the way we will provide some tips to help keep coordination on track and on budget.

Learning Objectives
- Discover the process of BIM coordination from start to finish
- Learn how to run successful kickoff and coordination meetings
- Understand which deliverables are necessary for successful coordination
- Learn how to keep coordination on budget and on schedule

Speaker(s)
Jonathan Hill
Jonathan Graduated Dunwoody College of Technology in 2010 with an A.A.S. in Architectural Drafting and Estimating. Since then he began his career at VDC Partners and then moved to join Knutson in 2012. He has a passion for technology and construction, which perfectly suits him for his position. Since then he has gained experience in several aspects of VDC, from BIM coordination to laser scanning to Virtual Reality. He has lead coordination on 30+ high profile projects in his career, utilizing both Navisworks and BIM 360 Glue. He is also Revit certified and is proficient with other VDC related software such as SketchUp, Cyclone Register, Register 360 and Recap Pro. He is experienced in writing and executing BIM Execution Plans, managing multiple models through construction and incorporating laser scans into the coordination process.

Mike Ferrera
Mike recently graduated from University of Minnesota Duluth with a bachelor’s degree in Geographic Information Systems. Since graduation, he has been working as a Virtual Design and Construction (VDC) Specialist at Knutson Construction and has quickly become a critical component of their BIM/VDC capabilities. His experience with a broad range of software has been helpful in creating innovative new procedures within BIM modeling, laser scanning, and coordination.
BIM COORDINATION AT OUR FIRM:

The documents below are part of our internal BIM Coordination process. It has evolved over the years, and will continue to evolve as we learn and improve our process more. These steps are important to follow in order to keep the project on schedule and budget. If the steps are not followed, it can be difficult to keep the project team informed and the coordination on schedule. Creating coordination drawings are key to holding all parties accountable.
BIM Coordination

Department: Virtual Design & Construction  Author: J. Hill
Implementation Date: 08/01/2017  Revision Date: 

-Learn how to run successful kickoff and coordination meetings
  - Kick-off Meeting
    - Schedule Kickoff meeting
      - Attach Execution Plan and Kickoff Agenda
      - Project team, VDC Manager, Necessary Subs, A/E and Owner
    - Run Kick-off Meeting
      - Track attendees
      - Review scope
      - Review BEP
      - Review Schedule
  - Finalize Documentation
    - Finalize the BEP
    - Finalize scope
  - Coordination Setup
    - Create the project on file transfer site
    - Save Designer models on file transfer site for team to access
    - Create NWC’s for each area (discussed in Kickoff)
    - Export NWC’s architecture and structure to transfer site
    - Grant transfer site access to coordination team
  - Project Team Setup
    - Help setup the project team with Autodesk Accounts and setup BIM 360 Glue
    - Share model with project team
  - Preparing for Coordination Meetings
    - Coordination meeting frequency should be determined during the kickoff meeting
    - Prepare an agenda prior to each meeting
    - If this is the first meeting of the area, Setup the clashes prior to meeting
    - If this is not the first meeting, update the clashes prior to the meeting
    - As you update the clashes review them and decide if they are actual clashes or if you can approve them
    - Create 2 folders for each clash group. Name them “Active” & “Approved”
      - Move all “New” & “Active” clashes to the “Active” folder
      - Move all “Resolved” & “Approved” to the “Approved” folder
  - Running Coordination Meetings
    - Track your Attendees
    - Review groups of clashes
      - Do not go through every single clash. Focus on areas of clashes
    - As your review clashes create action items on minutes
    - If one trade has significantly fewer clashes than the others, start with that trade, so you can get them off the call as to maximize time.
    - Send out meeting minutes to team after the meeting so everyone knows what is expected of them for the next meeting.
BIM Coordination

- Understand which deliverables are necessary for successful coordination
  - Coordination Wrap-Up
    - Continue coordinating the project area by area.
    - Once an area is complete have the trades create coordination drawings
    - Disseminate the coordination drawings to the field
    - Once coordination is complete, save a final NWD of the entire model
    - If required or requested send the model to the owner
  - Coordination Documentation
    - Go through ROI capture with the project team
    - Save some images from the model for marketing use

- Learn how to keep coordination on budget and on schedule
  - Get BIM Coordination on Project Schedule
  - Send out Meeting minutes w/ action items
  - Keep your PM Updated on progress (through minutes)
  - If someone is falling behind get your PM to assist
  - Track your hours on projects
  - Establish a budget with your manager at project start
  - Regular budget updates
  - Project team meeting involvement
-Navisworks Demo
  • Once you have appended aligned the models follow the steps below
  • Section the model as needed based on what was discussed in the kickoff
  • Coordination Setup
    o Create clash tests for each trade vs each other trade
    o In each clash test create 2 groups
    o Name them “approved” and “active”
    o Review each clash
    o Approve the clashes that are not actual clashes
      ▪ (ex. Pipe running perpendicular through a wall)
    o Repeat this process prior to each coordination meeting until coordinated
  • Create folders for views for each coordination meeting
  • Create views of clash areas for subs to review
  • Export any views that might need design input
  • Create other helpful model views for easy navigation around the model
  • Export weekly NWD’s that captures the model progress
    o You will also share these models with the field/project team

-BIM 360 Glue Demo
  • Upload your weekly NWD’s to BIM 360 glue
    o (via the glue addin, one drive, drop box, email, etc)
  • Show your project team how to navigate the model in BIM 360 glue
    o (if you are unfamiliar the help button in the corner shows what each button does)
  • BIM 360 Glue is an excellent way to share the model with the field and an easy way for
    the less technically savvy to access and manipulate a model
Project Setup Form
1. Project name
2. Project description (general description of work)
3. Contract type
4. Project cost
5. Construction start
6. Construction milestones
7. Number of levels
8. Size in square feet
9. Project VDC/BIM Goals
10. Is there a model from preconstruction?
11. Are there prefabrication goals (headwalls, MEP racks, etc.)
12. Are there any pain points specific to the project?
13. Virtual mockups to be used?
14. Phasing/Sequencing visuals to be used?

Team & Capabilities Form
1. Owner?
2. Architect? Model capabilities?
3. Structural Engineer? Model capabilities
4. Mechanical Engineer? Model capabilities?
5. Electrical Engineer? Model capabilities?
6. Civil Engineer? Model capabilities?
7. HVAC contractor? Model capabilities?
8. Piping contractor? Model capabilities?
9. Plumbing contractor? Model capabilities?
10. Electrical contractor? Model capabilities?
11. Fire suppression contractor? Model capabilities?
12. Med gas contractor? Model capabilities?
13. Pneumatic tube contractor? Model capabilities?
14. Curtain wall contractor? Model capabilities?
15. Aquatics? Model capabilities?
16. Steel fabricator? Model capabilities?
17. Structural support framing? Model capabilities?
18. Food service? Model capabilities?
BIM Data Capture Worksheet

Design Issues Encountered-Describe: (patient lifts, self perform, sleeves vs core, embeds, excavation, visual communication, mockups, existing tie-ins, laser scanning, drones)

Resolution: what was the solution?

Project Impact: Costs avoided, rework avoided, time saved, did our efforts prompt redesign?

Design Issues Encountered-Describe:

Resolution-Describe

Project Impact:

Design Issues Encountered-Describe:

Resolution-Describe

Project Impact:

Design Issues Encountered-Describe:

Resolution-Describe

Project Impact:

Design Issues Encountered-Describe:

Resolution-Describe

Project Impact:

Design Issues Encountered-Describe:

Resolution-Describe

Project Impact:
Where were any learning curves for designers or subs that affected project?

Budgeted VDC/BIM Hours/$:

Actual VDC/BIM Hours/$:

Was there any prefabrication?

Did you have less RFI’s than the average?
Average RFI’s- your RFI’s

Did you have less change orders than you would have without BIM?

Did the schedule get impacted in any way?

How many clashes were there at the beginning of the job? How many were resolved?
Any quantifiable clashes?

Was productivity increased in any way? (not spending as much time on paperwork, allowed to complete other tasks? Higher quality?)

Clashes were resolved early due to coordination. Did this allow for prefabrication opportunities? Did this save time/money?

What value or new process came out this effort and how do you think it affected the project?

What worked well, what did not etc.

Was coordination organized and completed to fit your construction schedule?

-Do you have suggestions for improvement?

Lesson’s learned: Quotes are really good here.

Anything you want to add we haven’t asked?
What challenges did we encounter?