Small Firms in the Big BIM World

Jerry Marselle

Director of Technology – SMBH Inc.

Class summary

We've heard all about the successes that companies have had jumping into Building Information Modeling (BIM) using Revit software. But more often than not, these experiences come from the big players—large companies with hundreds of employees and multiple offices worldwide. But what about the little guy? Firms of 15 to 20 people, or even less. Can Revit software benefit them? We will dive into the special challenges that are faced by smaller firms wanting to take the leap to Revit software, and we'll look at how living in the BIM world can help them to not just play, but also thrive, alongside the larger companies.

Key learning objectives

At the end of this class, you will be able to:

- Understand the importance information plays in the BIM Process
- Recognize the time and money involved in migrating to Revit
- Work in the larger collaborative world, not just in my drawings
- Provide larger firms with the high-quality models they need, while still being profitable

Understanding

Why do we need BIM?

“A study was commissioned to identify and estimate the efficiency losses in the U.S. capital facilities industry resulting from inadequate interoperability. The study included design, engineering, facilities management and business processes software systems and redundant paper records management across all facility life-cycle phases. Based on interviews and survey responses, $15.8 billion in annual interoperability costs were quantified for the capital facilities industry in 2002. Of these costs, two-thirds are borne by owners and operators, which incur most of these costs during ongoing facility operation and maintenance.”

REVIT

IS

BIM

NOT

What is BIM?

Building information modeling (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of places. Building information models (BIMs) are files (often but not always in proprietary formats and containing proprietary data) which can be exchanged or networked to support decision-making about a place.

Source: Wikipedia

What is Revit?

Autodesk Revit is building information modeling software for architects, structural engineers, MEP engineers, designers and contractors. It allows users to design a building and structure and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. Revit is 4D BIM capable with tools to plan and track various stages in the building's lifecycle, from concept to construction and later demolition.

Source: Wikipedia

What does this mean?

- BIM IS A PROCESS! It is about how we gather information, how we use that information, how we convey that information to each other, and how we work together as a team.

- AUTODESK REVIT IS A BIM TOOL! It is a piece of software that we use to leverage that process. And just like any tool, it can be used incorrectly.

What is the BIM Process?

- No Single Definition
- Model centric
  - All about having access to models
  - Not all models are the same
- People drive the creation of high quality models
  - Everyone on the team is the backbone of the process
  - Keep the lines of communication open

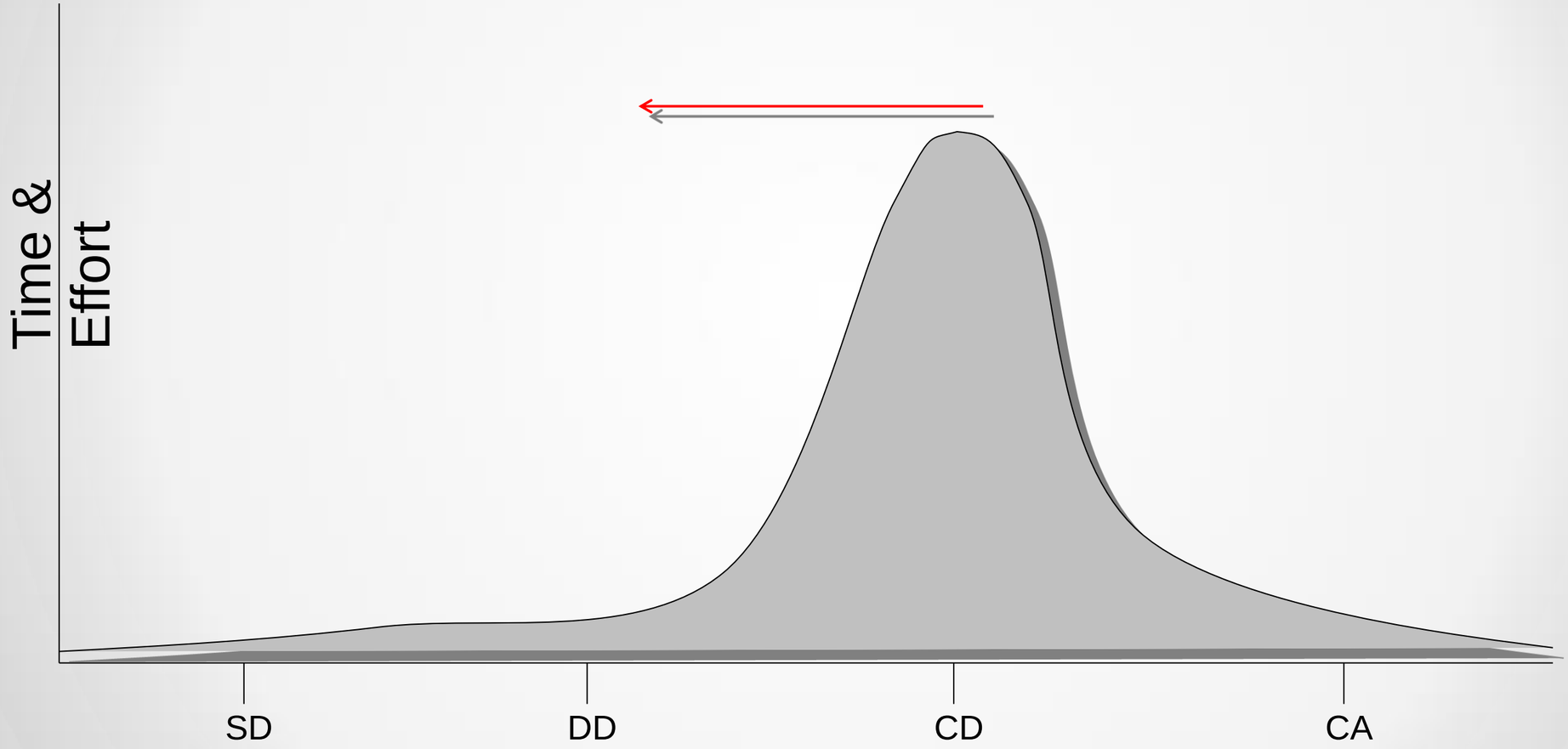
The most important piece

NFORMATION

BIM

Changes Workflow

The Paradigm Shift



Does BIM Deliver?

Any Star Wars fans in the house?

The Letterman Digital Arts Center, San Francisco, CA http://www.viewbyview.com/html/ldac.html

- All team members were involved in creating the BIM models: LDAC Management Team, Architects, Structural and MEP Engineers, contractors and fabricators – even George Lucas himself
- Weekly meetings to check progress and correct any potential problems
- Used the BIM model to simulate emergency situations
- Over 200 design and construction conflicts were identified, most of which were corrected before construction
- Process resulted in an estimated savings of over $10 million on this $350 million project

What about the rest of us?

SMBH Project Study

- Ohio School for the Deaf/Ohio State School for the Blind
- Original Project
  - 2 Academic Buildings over 150,000 sq/ft each
  - Entire project completed in Revit over 1 year
  - Small Profit
  - Total Construction cost ran over budget

SMBH Project Study

- REDESIGN!!!!!
  - One building completely redesigned, second building half redesigned
  - Schedule compressed to 6 weeks
  - One given 25% of our original fee
- PROFIT = 49%!

SMBH Project Study

- The Difference
  - Created a ‘team’ of Engineer and BIM Specialist
  - Shared the lines of communication
  - Shared responsibility for project delivery
  - The process was FLEXIBLE, not rigid.

SMBH Project Study

- The Process
  - Team worked together to decide who was the best to perform each task
  - Main Goal – Reduce Redundancy
  - COMMUNICATION
  - Process decisions were made without the bounds of any past or current processes
  - The technical side of how Autodesk Revit was used was not tied to any past standards

SMBH Project Study

- What we learned
  - Communication is key to reducing redundancy
  - Communication has to be between everyone
  - Internal process had to change
  - Integrate our process with client's process
  - Tell the client when we need info
  - Ask the client when they need info
  - Revit is a powerful tool – use it, don't force it.

SMBH Project Study

- Summary:
- We focused in mostly on PROCESS changes, not just on technical tips and tricks
- Changed information flow, duties and communication paths
- Used Autodesk Revit as it wants to be used

Money, Money, Money, Money, Money – Moooooonnneeeeeyyyyyyyy

Computer Upgrades

System requirements for AutoCAD 2016	
Operating System	• Microsoft® Windows® 10 (requires AutoCAD 2016 SP1) • Microsoft Windows 8/8.1 • Microsoft Windows 7
CPU Type	Minimum Intel® Pentium® 4 or AMD Athlon™ 64 processor
Memory	**For 32-bit AutoCAD 2016:** • 2 GB (3 GB recommended) **For 64-bit AutoCAD 2016:** • 4 GB (8 GB recommended)
Display Resolution	1024x768 (1600x1050 or higher recommended) with True Color
Display Card	Windows display adapter capable of 1024x768 with True Color capabilities. DirectX® 9 or DirectX 11 compliant card recommended.
Disk Space	Installation 6.0 GB
Pointing Device	MS-Mouse compliant device
Media (DVD)	Download and installation from DVD
Browser	Windows Internet Explorer® 9.0 (or later)
.NET Framework	.NET Framework Version 4.5
Network	Deployment via Deployment Wizard. The license server and all workstations that will run applications dependent on network licensing must run TCP/IP protocol. Either Microsoft® or Novell TCP/IP protocol stacks are acceptable. Primary login on workstations may be Netware or Windows. In addition to operating systems supported for the application, the license server will run on the Windows Server® 2012, Windows Server 2012 R2, Windows Server 2008, Windows 2008 R2 Server editions. Citrix® XenApp™ 6.5 FP1, Citrix® XenDesktop™ 5.6.

AutoCAD Machine: $1000-$1500

Performance: Large, complex models	
Operating System [1]	**Microsoft® Windows® 7 SP1 64-bit:** Windows 7 Enterprise, Ultimate, Professional, or Home Premium **Microsoft® Windows® 8 64-bit:** Windows 8 Enterprise, Pro, or Windows 8 **Microsoft® Windows® 8.1 64-bit:** Windows 8.1 Enterprise, Pro, or Windows 8.1
CPU Type	Multi-Core Intel® Xeon®, or i-Series processor or AMD® equivalent with SSE2 technology. Highest affordable CPU speed rating recommended. Autodesk® Revit® software products will use multiple cores for many tasks, using up to 16 cores for near-photorealistic rendering operations.
Memory	16 GB RAM • Usually sufficient for a typical editing session for a single model up to approximately 700 MB on disk. This estimate is based on internal testing and customer reports. Individual models will vary in their use of computer resources and performance characteristics. • Models created in previous versions of Revit software products may require more available memory for the one-time upgrade process.
Video Display	1,920 x 1,200 with true color DPI Display Setting: 150% or less
Video Adapter	DirectX® 11 capable graphics card with Shader Model 3 as recommended by Autodesk.
Disk Space	5 GB free disk space 10,000+ RPM (for Point Cloud interactions) or Solid State Drive
Media	Download or installation from DVD9 or USB key
Pointing Device	MS-Mouse or 3Dconnexion® compliant device
Browser	Microsoft® Internet Explorer® 7.0 (or later)
Connectivity	Internet connection for license registration and prerequisite component download

Autodesk Revit Machine:
$2000 (desktop) $3000 (laptop)

Network Upgrades

- Need at least a 1gb/sec network
  - 10gb/s, 40gb/s, 100gb/s are soon to be realities
- Storage Space
  - You need lots!!!
  - Be sure your storage system is expandable

Miscellaneous Technology

Training

- An Autodesk Reseller that offers training programs, both in and out of house (recommend)
- Books - there's lots out there
- Videos - There are different training courses you can get on video, or download from the web, which are a step by step teaching you the Revit Fundamentals
- MOOCS, Lynda.com, Youtube.com - You can learn a lot from web videos
- Mentor – you need someone that you can ask questions to and who can help vet ideas. Someone experienced, that you can trust. (More than one!)

Training

NEVER STOP TRAINING!

NEVER STOP LEARNING!

There are dangers in not recognizing these costs

- Every one of the previously mentioned costs feeds the BIM Process
- ‘Skimping’ on, or even flat out ignoring them will make you less efficient and a hindrance on the project

Time Investment

- Setting up new standards
- Define workflows
- Create reusable content
- Create new templates

- Use your early projects for this content

You need a BIM CHAMPION!!

BIM Champion

- Sole purpose is to understand BIM and master Revit
- Must be excited about what BIM and Autodesk Revit can bring to your firm
- They will have to wear many hats:
  - Tech support
  - Advisor
  - Problem solver
  - Marketer
  - Liaison
  - Bridge builder

BIM Champion

- The firms we work with will judge our entire firm by the BIM Champion
- Must be confident in their abilities
- Comfortable with the BIM Process
- Represent the firm PROFESSIONALLY

Working in the Larger World

Building Relationships

- Outside of the office
- More than just attending required meetings or a phone call or email
- Must be ACTIVE part of the process
- Be flexible, willing to hear everyone's opinions
- Don't be afraid to make our opinion known and ask for what we need

- BIM Champion must develop a relationship with their counterpart

Building Relationships

- Inside the Office
- Workflows will change
- Office dynamic will become more collaborative
- Will need to develop new standards and processes

- BIM Champion must have a team building philosophy
- Will encounter roadblocks and challenges

Building Relationships

- “The Roundtable”
  - Partnered with an Architect and an MEP firm
  - Monthly, 2-3 hour meeting, where we could discuss all things BIM and Autodesk Revit
  - Discussed issues facing our firms in general
  - At times the meeting was technical in nature, sometimes business oriented, sometimes just “philosophical”
  - Didn’t worry about sharing any trade secrets or someone gaining some kind of ‘edge’
  - Our interest was only to help us work better with each other

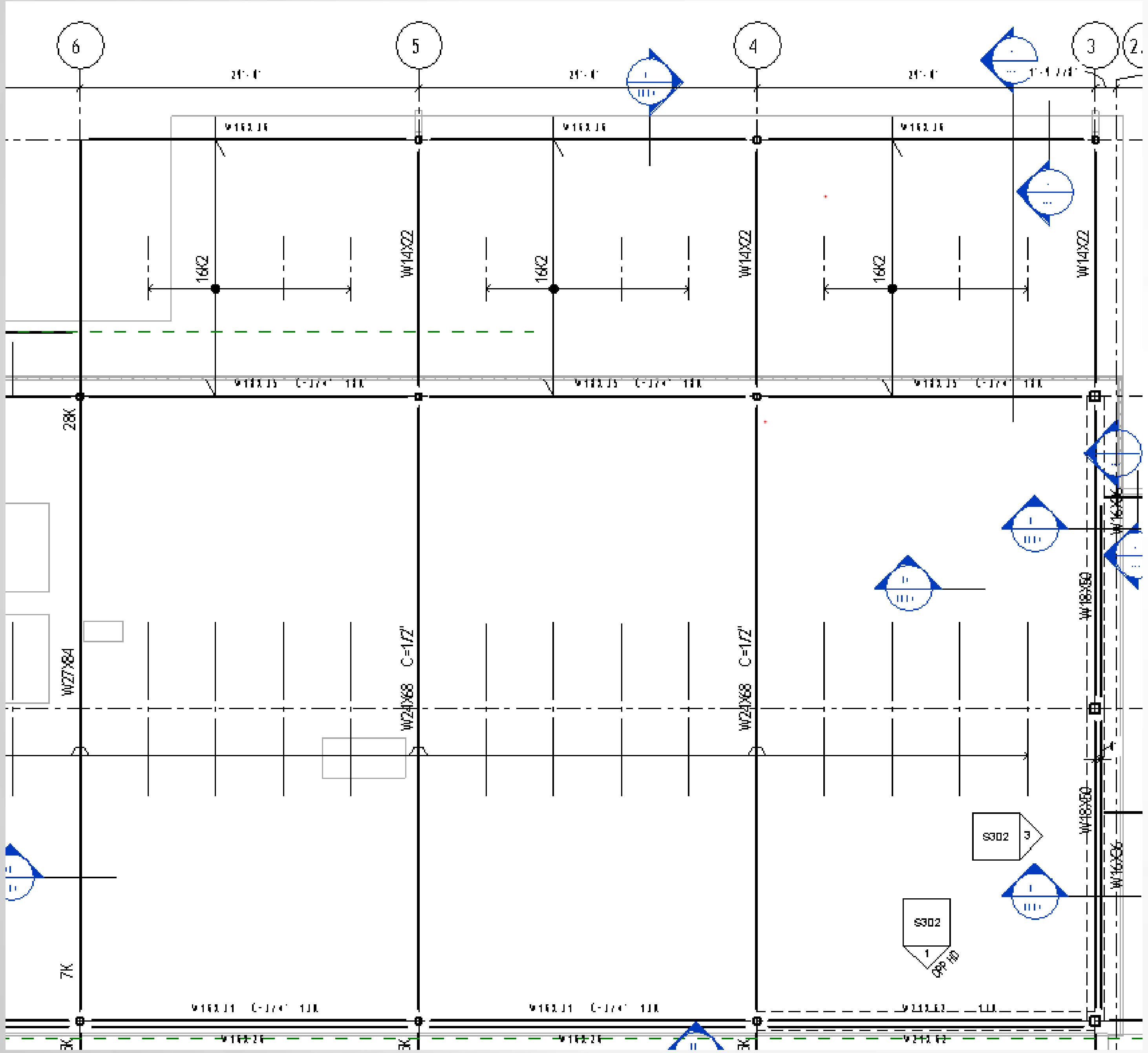
Give the People What they Want!!!

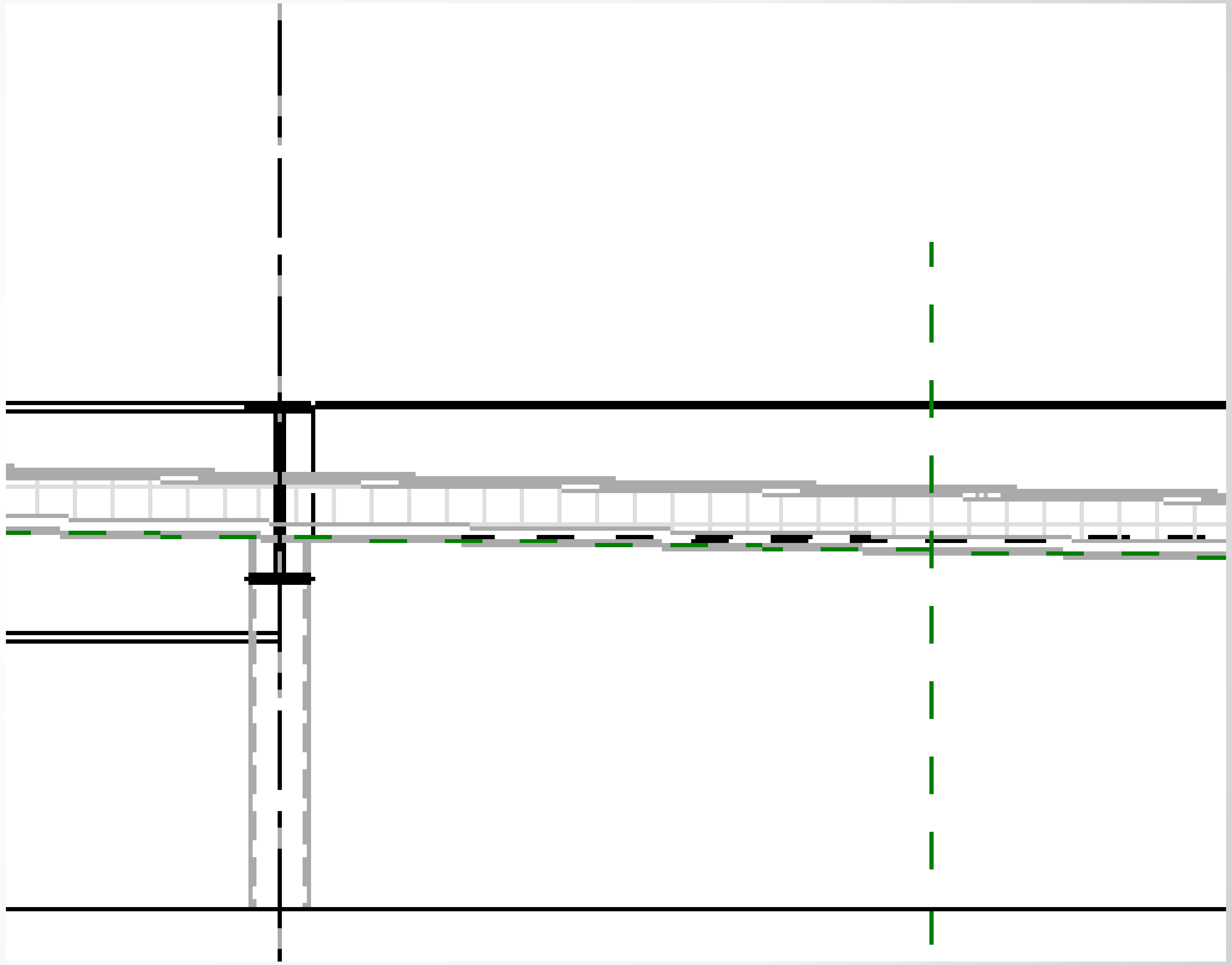
Quality Work

Accuracy

- Accuracy is of the UTMOST IMPORTANCE!
- Avoid the “close enough” mentality
- Without accuracy, Revit becomes a drawing tool
  - Counterproductive
  - Costs the entire team time and money
  - Coordination will be worthless
- In the future, the model will become our deliverable
  - Start thinking in those terms now

Accuracy





Model What is needed

- This can vary per project
- Level of Detail (LOD) Standards is a good guide
  - LOD300(350) is ideal for a design intent model
- Discuss this EARLY!
- Keep an open mind
  - You may have to model for the Design Team, not just yourself
- Reduce Redundancy – define ownership

Coordinate Often

- Determine that frequency early and STICK TO IT!
- Not simply a model share, need communication about the model
  - What has changed
  - What we're doing
  - What are our goals going forward
  - Without communication, we're flying blind

Defining Standards - tips

- Use Revit Content as much as possible (especially for model elements)
- Create a library of symbols/reusable content
- Create a standards manual
  - Model Standards
  - Drawing Standards
  - Project Set-up Guidelines
  - Collaborate
  - Worksharing

Defining Standards - tips

- Template Guidelines/Best Practices
  - Keep the template as clean as possible
  - Include MOST COMMON types for model elements
  - Include ALL symbols, whether “Out-of-the-box Revit” or custom created
  - Setup standard schedules
  - Include all Dimension and Test Families
  - Create Drafting Views for Standard Details
  - Load all Title Blocks
  - Create View Templates for different types of views

Defining Standards - tips

- Legacy Standards vs “The New Way!”
- Revit provides a fair amount of flexibility in making drawings look a certain way
  - Very difficult to make drawings look 100% like AutoCAD
- What’s important, the look or the functionality?

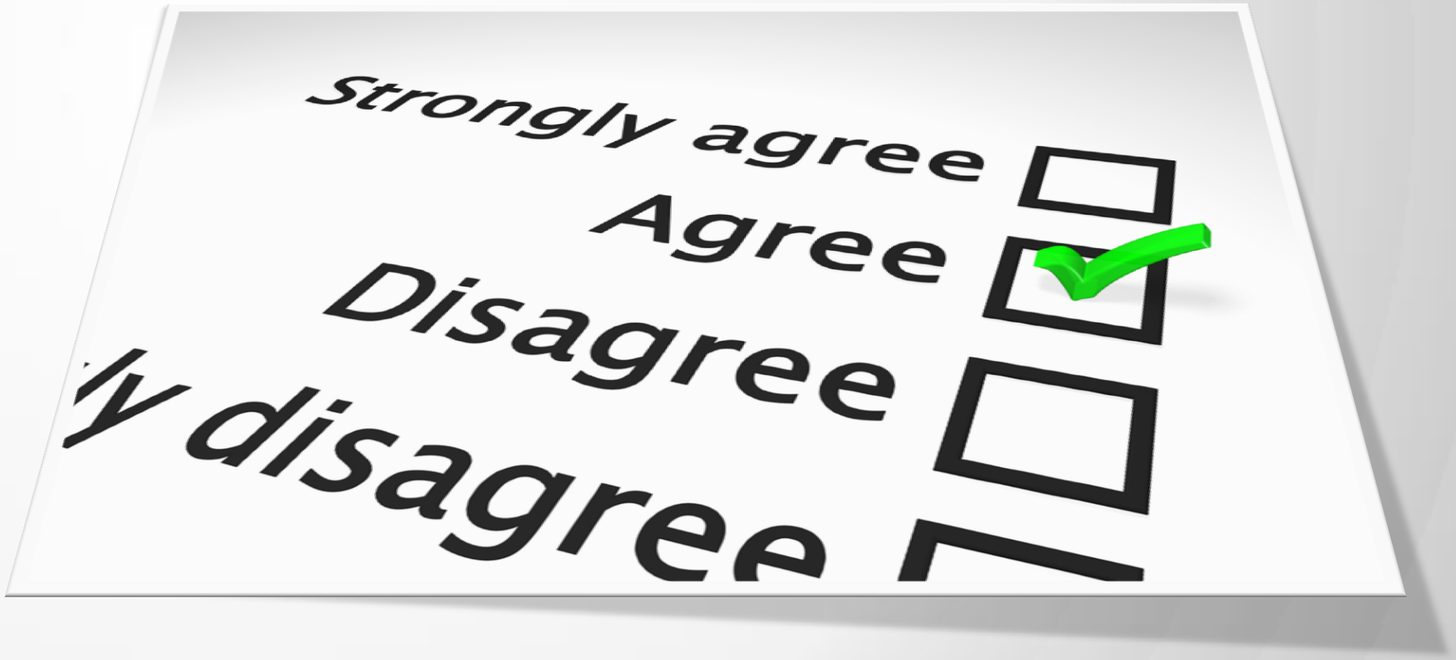
In Summary:

- The BIM Process thrives on information and communication
- Count ALL of the costs, not just software, and be willing to make the investments
- Build as many relationships as we can
- Accuracy is the key to building high-quality models that saves us time and money

Questions?

Be heard! Provide AU session feedback.

- Via the Survey Stations, email or mobile device.
- AU 2016 passes awarded daily!
- Give your feedback after each session.
- Give instructors feedback in real-time.



Too many sessions, too little time?

After AU visit:

AutodeskUniversity.com

- Recorded sessions
- Presentations and handouts
- Key learnings

Don’t miss a second! Find hundreds of sessions waiting for you.