

Managing BIM Projects Without Going CrAzY!!!

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Class summary

This course covers effective practices for project managers, engineers, and designers working on Building Information Modeling (BIM) projects for heating, ventilating, air conditioning, electrical, plumbing, water/wastewater, and other engineering practices. Learn how BIM and Revit software alter the traditional design workflows and processes, and discover how to manage the disruptive changes. The course will cover pre-project planning, dealing with project components and content and understanding what tools can really help the project bottom line. We will also cover where Revit software alters typical project tasks. The course is well suited for the first-time manager and experienced user.

Key learning objectives

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

- Discover key points for the project execution plans and staffing
- Learn how to develop equipment lists and work with vendors
- Understand Revit software versus CAD Tasks in a project timeline
- Understand key Revit software features, including Schedules and Views

Class Rules:

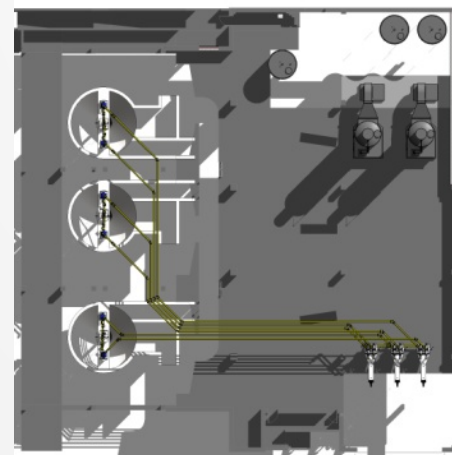
Course ID is MP1573!

This course is being streamed LIVE to AU Online -
Please hold questions until the section breaks

And most important – Have FUN and don't go too CrAzY!

Let's get started!

What types of projects does your firm design – and does BIM work for them?



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Has this ever happened to you....

The "BIM" Announcement

Managing the Project Execution Plan and Proper Staffing

Managing the Project Execution Plan and Proper Staffing

- The project type is important but does not limit BIM use
- Have a plan for integrating BIM into work process
- Learn to manage disruptive changes
- Learn how to select and train staff for successful outcomes

Deciding Go or No Go on BIM Projects – Before the Project Execution Plan

- Risk Assessment – do your homework!
 - Required software package and version
 - If BIM, then the Level of Development required
 - Ancillary packages that are linked to the design software – energy analysis, specific object modeling (bridges, roadway, process, etc.)

Deciding Go or No Go on BIM Projects – Before the Project Execution Plan

- Influencing Factors – Know them!
 - Is the client requiring BIM as a deliverable?
 - Does the client require specific software and version?
 - Does the client demonstrate understanding and expertise with the required software and deliverables?
 - Does the client include standard files, such as templates and content?
 - Does the client require interaction with data, which is associated with the model, for life cycle and asset management?

You WON – NOW what?

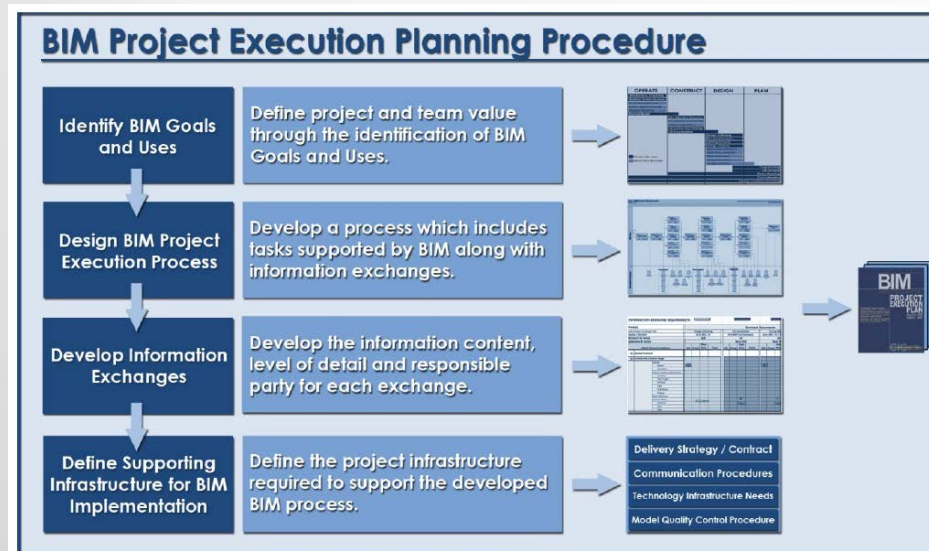
- Understand the impact of using BIM
 - More BIM projects fail due to poor design workflows and practice than software implementation
 - BIM workflows uncover these weaknesses
 - BIM workflows can also be restrictive
 - Learn and understand the National BIM Standard
<http://www.nationalbimstandard.org/>
- Learn how to use Project Execution Plans (PxP) to stay on track



National BIM Standard - United States™ Version 2
an initiative of the National Institute of Building Sciences buildingSMART alliance™

The Project Execution Plan

- How the plan helps:
 - Identify goals and high value BIM uses during each project phase
 - Design the BIM Execution process through the creation of process maps
 - Define the BIM deliverables in the form of information exchanges
 - Develop the infrastructure to support the implementation such as contracts, communication procedures, technology and quality control.



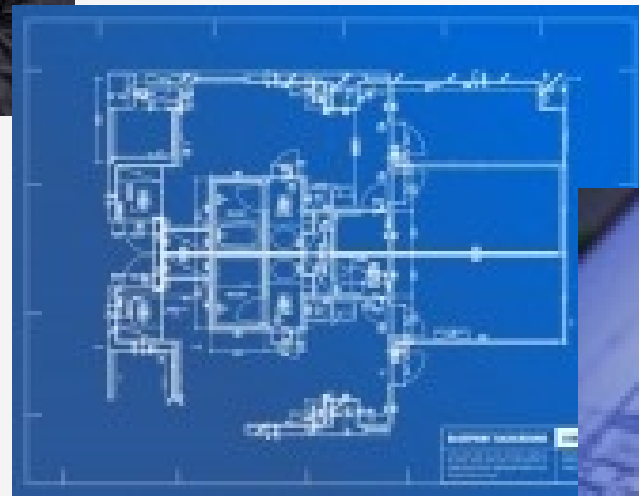
The BIM Project Execution Planning Procedure,
National BIM Standard, Penn State

Identify BIM Goals and Uses, and Identify Staff



Conquer Fear / Discover Relevance / Improve the Method

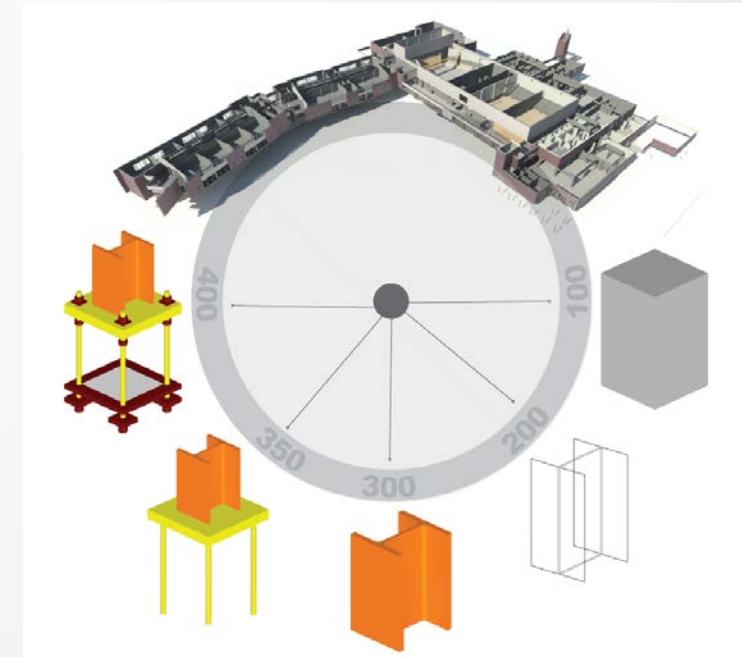
Identify BIM Goals and Uses, and Identify Staff



Conquer Fear / Discover Relevance / Improve the Method

Identify BIM Goals and Uses, and Identify Staff

- Ask these questions:
 - *What parts of a project will be modeled, and what part will continue to be produced in CAD?*
 - *How accurately should the model represent the actual conditions of the finished product?*
 - Know your LOD – Level of Development
 - 100-200 – Existing
 - 300/350/400 – Design, Design Build
 - 500 – As-Built



Identify BIM Goals and Uses, and Identify Staff

- Ask these questions:
 - *How do I select the appropriate staff for the project?*
 - Your STAFF is the key to success
 - Your UNDERSTANDING of today's tools is critical
 - TRAINING is forever – it's better to train them and have them leave, than not train them and have them stay
 - IMPLEMENTATION is the BLOB – it goes on forever...!
 - **OVERCOMING THE FEAR OF CHANGE IS PARAMOUNT!**
 - *Once the staff is assigned to the job, how do I make sure they can do the work the way it needs to be done?*

Identify BIM Goals and Uses, and Identify Staff

- Today's Reality – Training is REQUIRED AND ONGOING!
 - *Start with Trusted Advisor!*
 - *Develop in house Expertise – the Subject Matter Expert(s)!*
 - *Have a well formed training plan, based on the staff*
 - Management – Corporate and Project
 - Design – Engineering/Architecture/Industrial
 - Technical – Designers, not Drafters
 - BIM Management – Keep them in their cage...

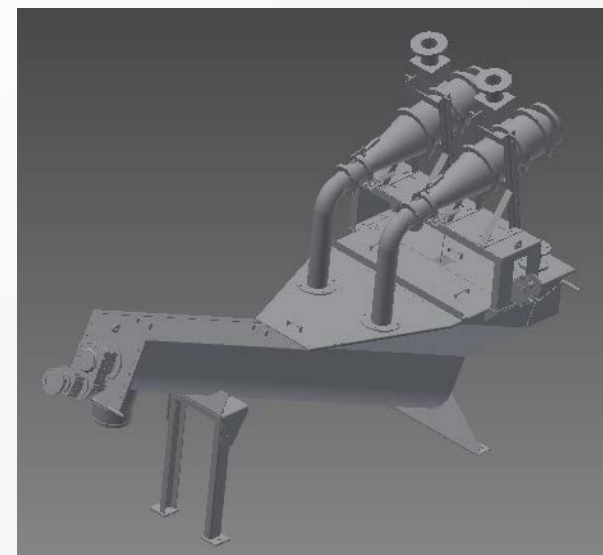
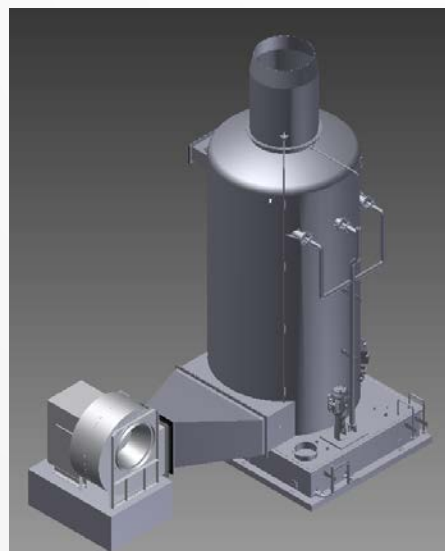
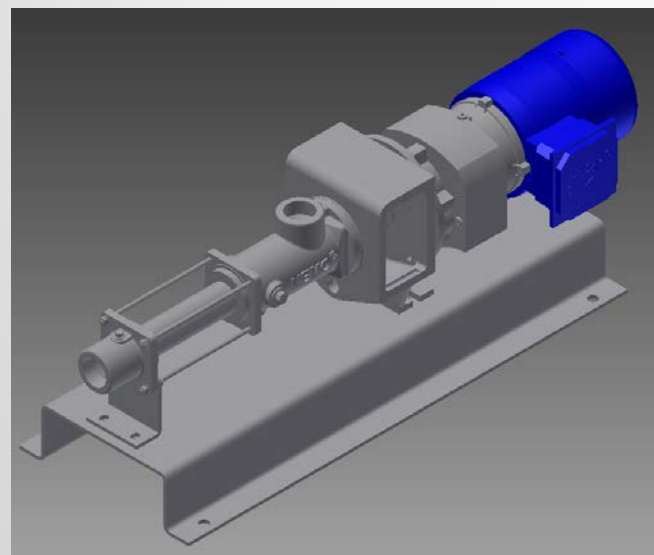
Identify BIM Goals and Uses, and Identify Staff

- Training Topics should include:
 - BIM Overview
 - ROI Areas – Cost/Benefits
 - Software
 - Hardware
 - Training
 - Support
 - Workflow Adjustments – 4 Step
 - Legal Requirements/Risk Assessment
 - Contractual
 - Standards
- Tools to Task – Traditional versus BIM
 - Data – Excel vs. Model
 - Internal vs. External
 - Sizing
 - Analysis
- External Analysis Applications/Integration
 - Compatibility
 - Compliance
- CAD Integration
- Documentation Process
- Content Development

Selecting and Adding Equipment – It's Time to GO!

Selecting and Adding Equipment

- The First Area of Culture Change!
- Getting the Models/Data/Information you need
- Basis of Design versus Final Selection
- GET IT EARLY – AS MUCH AS POSSIBLE



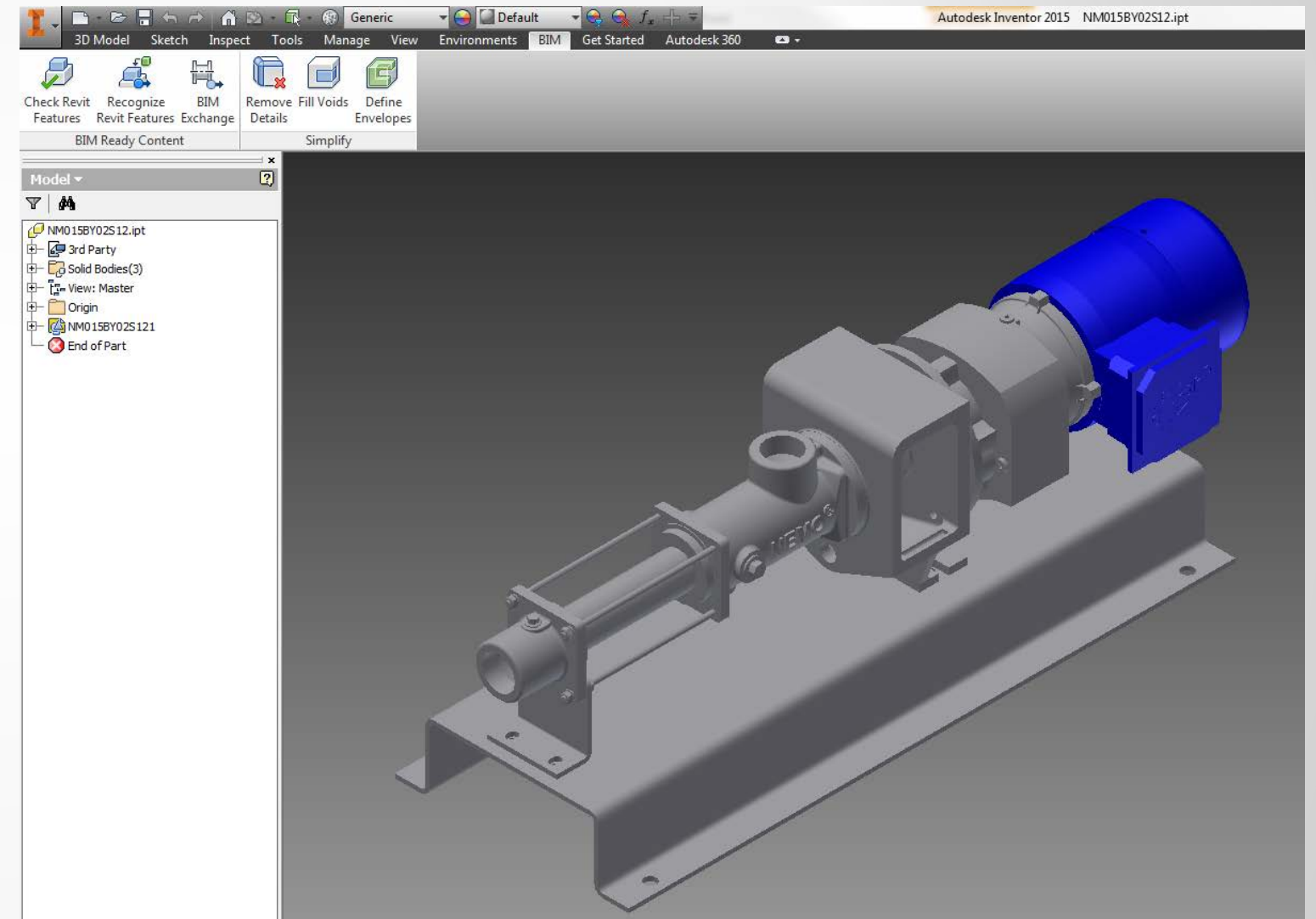
Equipment Lists

- Know the Revit Categories
 - Mechanical/Electrical Equipment
 - Fans/AHU/Pumps/Panels – Building Service/Process/Controls
 - Internal Connections
 - Specialty Equipment
 - Owner Provided
 - External Connections
- Excel is Common
- SQL is Preferred
- Define what Data is to be Shared
 - Shared vs. Project vs. Family

Working with Vendors

- The Relationship CHANGES
- Look for Representations for Basis of Design
- Key Items to Ask:
 - *Does the vendor provide equipment models through their website, to go with their equipment selection tools?*
 - *Can the vendor provide the file in a format you can edit?*

SIDETRACK – Demo!



Working with Vendors

- Don't Forget:
 - *Did the vendor include a detailed model, and include lot of informational parameters with their family?*
- Using Non-RFA/ADSK Content
 - Use **Inventor** or **Fusion 360** to edit supplied models that are not in ADSK/RFA format
 - Remove internal parts, high detail items (such as bolts with threads)
 - Use **Recognize Revit Features** to discover what can be used/edited natively in Revit
 - Use **Simplify** tools to remove additional details, fill voids and define envelopes.
 - Use **BIM Exchange** to save as ADSK or RFA
 - Add Connectors/Corporate Standard Shared Parameters and Subcategories in family file
 - Set classification/OmniClass numbers

Working with Vendors

- Using Online or Provided RFA Families/Edited Models
 - Add MEP connectors
 - Remove non-standard parameters from families
 - Add/Associate standard shared parameters based on default schedules
 - Set classification/OmniClass numbers
 - Limit text-based versions to specific model(s) as need for design
- **Get the pertinent data that's associated with the equipment!**

Revit Versus CAD – CAGE MATCH!!!

Revit versus CAD – CAGE MATCH!!

- Learn how Revit alters traditional design tasks
 - *Forget everything you know about how to put a project together in CAD*
 - *Plan on spending more time in the schematic phase and less time in the document phase.*
 - *Break your work down into the four step process – select and add equipment (targets and sources) define systems, create connecting geometry and annotate.*

Revit versus CAD – CAGE MATCH!!

- Pre-design/Schematic Phase
 - For the architect:
 - Set the site and orientation!
 - Perform massing studies for solar/shadow impact, airflow, etc.
 - Define bounding elements and datum levels in the arch model – can be generic (LOD 100-200) until materials are selected – includes floors, slabs and roofs
 - Add room objects to arch model, space and zone objects to MEP model – sync room and space data

Revit versus CAD – CAGE MATCH!!

- Pre-design/Schematic Phase
 - For the MEP/Process engineer:
 - Develop and refine schematic layouts – hydraulic profile, process schematic
 - Best time to perform analytical studies – energy, airflow (CFD), lighting, LEED, etc.
 - Don't over-detail or over-model!
 - Select BOD equipment as early as possible based on programming/criteria
 - Locate major equipment, targets/sources and define preliminary systems – HVAC, piping, electrical, plumbing, process

Revit versus CAD – CAGE MATCH!!

- Design Development Phase
 - For the Architectural/Interior/Industrial Designer:
 - Add more detail to bounding elements – wall, door, window types, etc. based on analysis results
 - Add owner required equipment and built-in components – casework, furniture, industrial, etc.
 - For the Structural Designer:
 - Develop/Refine structural model to show minimum of primary concrete/steel/etc. materials
 - Coordinate openings/penetrations for major components

Revit versus CAD – CAGE MATCH!!

- Design Development Phase
 - For the MEP/Process Designer:
 - Develop and refine power and piping/plumbing riser diagrams, initial P&ID's
 - Refine Equipment placement, locations, parameters
 - Associate equipment with rooms
 - Add connecting geometry for MEP elements
 - Add power/air/fluid source connectors for industrial/architectural components, not in MEP model
 - Coordinate data between disciplines for MEP requirements
 - Associate and confirm loads with equipment

Revit versus CAD – CAGE MATCH!!

■ Construction Document Phase

- Complete model layouts with accessories, supports, etc.
- Track and quantify Power loads, HVAC loads, Lighting Loads
- Associate by Hyperlink
 - Reports
 - Specs
- Complete schedules with additional data and parameters
- Add 2D details where 3D isometric, section, elevation and enlarged plan views don't cover it – CAD/Drafting View
- Complete view annotation with labels based on information derived from parameters in the objects, adding text and dimensions where needed
- Complete constructability reviews using interference detection tools built into modeling tools

Revit versus CAD – CAGE MATCH!!

- Beyond BIM
 - The Investment in BIM goes beyond the design
 - Return Work - Renovations
 - Construction Management
 - Asset Management
 - Future Studies
 - Municipal Integration
 - Asset Management Uses
 - Single Source
 - OMMS
 - Lifecycle Management
 - Space Planning
 - Ownership

Disruptive Changes – Revit Tools that Make a Difference

Disruptive Changes - Views

- Use Views to Improve the Project
 - Using Rotated Views for Multiple Structure Projects
 - Rotate the view, not the model
 - Improves Layout performance for connecting geometry
 - Using Cropped 3D Views
 - Based on Section/Plan/Elevation Views, Crop Regions
 - Use to examine and clarify congested areas
- Let's see how this works...

Disruptive Changes - Schedules

- Use Schedules to Coordinate Data and Tags
 - Defining Shared Parameters
 - Start from the Master Shared Parameters
 - Define corporate master file and client specific files
 - Associate MEP parameters with connectors
 - Use for external data coordination
 - Using Schedule View Templates
 - Assign text and border lines
 - Creates Consistent Look and Feel
- Let's see how this works...

Wrapping it all up....

BIM Changes Everything...

BIM represents the same culture change:

- When the Beatles arrived in America,
- When disco finally died,
- The drafting table became a sheet storage facility and coffee cup holder,
- And working on a computer became a daily “thing”.

The key is not to let yourself be intimidated by the change, but instead learn to embrace it, and take advantage of the positive changes it can bring!

Session Feedback – MP1573!!

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time





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