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Revit Project Setup: Making the Most of Your Model

Aaron Vincent
Heapy Engineering

Learning Objectives

- Discover how to set up well-organized Revit projects efficiently.
- Learn the steps required to establish coordination between trades from the beginning of the project.
- Discuss the nuances that arise from project to project, and what to look out for.
- Learn how to utilize view templates and title block parameters.

Description

Revit project setup is often undervalued and overlooked. Starting the life of your project off on the right foot is the most important step. So, what are all the steps that we can take to maximize our model's potential? Let's discuss all the ways to increase productivity through effective Building Information Modeling (BIM) management.

Speaker

Aaron Vincent is a dedicated BIM (Building Information Modeling) Coordinator for Heapy Engineering in Dayton, OH. He is a LEED Green Associate. He began working with Revit in 2010 and has been managing Revit models over the last four years for a variety of projects in the healthcare, commercial, and institutional fields. He specializes in the setup and maintenance of Revit models as well as serving as a mentor to MEPTF (mechanical, electrical, plumbing, technology, and fire protection) engineers and designers in efficient and effective use of Revit.

Preface

This document is intended to express the best practices of the author. Due to the round table format of this class, our conversation is likely to be more of an organic discussion. It is my hope, that this handout may serve as a reinforcement and supplement to our meeting. To keep this from taking up too many pages, please refer to my PPTX for support images.

How can we set up well-organized Revit projects efficiently?

Setting up a new Revit model is a crucial step in every project's life. Like anything else, you want to start off on the best foot possible. By taking the time to do things right the first time, a lot of heart ache can be avoided. Taking the effort to give this step the attention it deserves will pay off in the long run.

Producing Consistent Quality

What can you do to ensure all projects retain a high level of quality?

Ideally, have the same individual setup all models.

If you have different people setting up each model, you will get inconsistent results. Having one primary model manager will ensure a standard of quality. Repetition will increase efficiency. It might be a bit of a dull task at times, but starting with a good model is very important. You should also have secondary model managers. You'll want to have someone competent available, should the primary individual be unavailable.

Create an instructional document for setting up new models

Since the secondary model managers might not be as up to speed, it is a good idea to develop an instructional document. If everyone who sets up a model, uses the same procedure and standards, you should get a comparable product.

Have a Revit template or starting project

Another way that Heapy ensures consistent quality, is with a Revit template. Within this template you can have a large amount of guess work removed. This template includes: view templates, default views created for each discipline, and the company's family library preloaded. A pre-created project file could also be used in lieu of a Revit template.

Asking the Right Questions from the Design Team

What **are** the most important things to know before setting up a new project? A BIM kickoff meeting is somewhat of a rarity, depending on the size and scope of the project. It's important to answer some key questions before setting up a model. If your company has a designated model manager, a lot of the time, they will not be in touch with the project scope.

Is this a new building or renovation and what phases will we have work in?

When setting up a project, knowing what phases there will be, will allow them to know which phases need to have a view setup. Also, an understanding of the phasing involved in the project, will allow for correct phase mapping between linked models.

Will we be combining or separating the models?

When setting up a model, you will want to decide in the beginning if the model will be one combined model, or split up. If you wait until you are further along in the project to split it up, you will bloat the size of your models and create extra work.

Which floors will we have work on?

Like phasing, another thing that dictates the views that need to be setup in a project, is the levels. Many times, a model you receive will have more levels created than you need to copy/monitor to show your work.

Using a Revit File Template

What should be included in your template?

Preloaded families

At Heapy, we have a fully developed library of Revit families that we maintain for use from project to project. These families are upgraded for each subsequent release of Revit, and the old versions are retained. The families which are used frequently are preloaded into our Revit template, while the others are loaded in as needed.

View templates

A great deal of repetition can be avoided with the use of pre-generated view templates. Heapy's template has a view template for each discipline, which controls the model categories that will be displayed. Most or all views should have a template. This will allow you to have more global control of your model.

Pre-created views

In Heapy's template file, we have a pre-created view for the first and second floor of each discipline. This gives us a good start towards getting all the views setup for the central model.

What steps are required to establish coordination between trades from the beginning of the project?

When we are getting ready to setup a new Revit project, what are the things we can do now to get everyone on the same page?

Coordinate Submissions Within Your Company & Others on the Team

During submittal time, things can get very hectic. There are some things you can address early on to avoid getting into a hurry.

Identify a submittal coordinator

This may sound like it's super obvious, but can really be a struggle. This role is often a project manager, team coordinator, or BIM coordinator. They will communicate the deliverables, as well as upload and download files.

Coordinate the title block information

Care should be taken to ensure a consistent product amongst trades. I always request a PDF or screenshot to ensure our title blocks match exactly, and we do not leave anything up to interpretation.

Define deliverables

BIM deliverables can get complicated for the average user. Along with native authoring software (Revit). Many times, there will be a requirement for bound or unbound CAD files, IFC files, COBie files, etc.

Establish Coordinates

Establishing project coordinates is an important step that should be performed at the start of every project.

Be sure to verify insertion type: Origin to Origin/ or by Shared Coordinates.

When linking models into your central file, it is important to pay attention to how you bring it in. Heapy by default chooses Origin to Origin. However, if you do have a BIM kickoff meeting, this is a good question to ask.

Acquiring coordinates

From a MEP perspective, coordinates are acquired from the architectural model, with the hope that they will not change part way through the project. Where do these coordinates come from? How is the survey point and project base point established? In Revit 2018, coordinates can now be acquired from a civil DWG.

Copy/monitoring

What does each party typically copy/monitor? Heapy only copy/monitor's levels and grids. We have experimented with copy/monitoring lights, but found it was not worth the effort of going through every review warning on each update.

Have a Lifecycle Plan

Before we get involved in a project that can be around for years, it's good to take the time to reflect on the coming weeks to years you will be operating in the model.

How long will your project be active?

The longer your model will be around, the larger and slower it will become. If you are going to split up your models, now is the best time to do that. Also, you want to try and think about whether the model might get upgraded.

Will the same version of Revit be used from beginning to end?

If the project is going to be around for a while, it is a good idea for push for the team to use the most current version of Revit. Heapy has a license agreement for Autodesk products, where we can only support the three most recent years of software. I want to avoid upgrading a project, but sometimes you have no choice. The more times you upgrade a project the more issues it will have with breaking, etc.

Will c4r be used?

Collaboration for Revit can be a great tool, but you need to think about how it will be used. I have been involved in projects where the rest of the team is on c4r, and Heapy was not. So weekly uploads and downloads had to be made. My experience with c4r has been mostly positive. I have had some issues with c4r going down for short periods. Also, while it is great to always have the latest and greatest models, that also means you can get changes coming without any notice.

Does anyone still use Revit Server?

Before there was c4r, there was Revit Server. This allowed multiple parties to operate in the same models through a VPN connection. Heapy experienced a lot of issues with failing connections and failed synchronizations.

Splitting up the Models

Splitting a model per area or by discipline is always an option, one that should be considered as early in the process as possible.

When should the decision be made?

In a perfect world, when you first setup the model. However, sometimes things come up in a project. In that situation, you must do your best to make a clean break. Be sure each sheet only appears once in all your models. Also, go to 3D and delete out duplicate model content. At that point link them all back together again.

What determines if it should be split?

How large will the project be? I like to keep our models under 200mb. This can also be personal preference.

Pros and cons

One pro is more accountability, it's less likely someone will do something wrong in your model. Another good thing is it will help keep model size down. The cons are increased model setup and management, as it is more effort to keep project information and parameters consistent between the models.

Are there nuances that arise from project to project? What should we look out for?

No two projects are ever identical, what are some of the oddities that can arise?

COBie

What is COBie? Why should we watch out for this?

COBie is a facility management tool adopted by the government. This is an extra deliverable and the amount of time and effort involved with getting started with COBie is not to be underestimated.

What can we do to keep it under control?

Budget sufficient hours to produce the files. Define requirements from the owner as soon as possible. The less guess work you do here, the better. A lot of the time, the owner won't necessarily know what it is that they are asking for. There are a lot of helpful videos and guides available on this.

Dynamo

How can we use Dynamo to make our lives easier for model management?

Dynamo is an exciting new tool that has the capability of allowing users to write scripts to perform operations using Revit's API. While I am a relative novice with this, with no programming experience, I have had the opportunity to do a little research and development.

One script I have been working on is to improve the Navisworks workflow. It is possible import a Navisworks clash report into Excel, then use Dynamo to place an orb family within Revit on each clash. This orb is a way for designers to have a visual cue for each clash. These orbs can also be scheduled, to ensure they will all be addressed.

Other potential uses for project setup I foresee are automating view and sheet setup as well as automatically placing a space on each room.

Point clouds/laser scans

What is the best workflow?

Utilizing Laser scanning to document existing conditions can be a very useful tool to reduce site visits. The only issue is, it will only scan what you can see at the time. Once you get the point clouds and get them linked in, drafting on top of them can be a bear. Keeping them turned on while you try to work will be very slow. If you have existing drawings that you can start with and then verify them with the laser scan, that has been our best way to utilize these.

How can this be improved?

Recently, when hiring a company to do the laser scans, Heapy has paid a premium to have the same company model everything for us. So, what are they doing to do this so efficiently, that we don't know about? It would be preferred to keep this in house, so we can verify the accuracy of the model.

Navisworks

What is the best workflow to minimize time spent?

There are many ways to run Navisworks, I still don't have the right answer for the best way to operate. Clash detection can be done within Revit, but I'm not sure how reliable that is to catch everything.

Various ways to operate

The traditional way is to run clash detection and sit in a room with everyone and go over these, one at a time. This is very time consuming and not a very good use of everyone's time. Alternatively, you can export a collision report and give that to the designers. My experience with the collision reports, is most people won't look at them. I have been developing a Dynamo script which will place a schedulable orb on each clash. I am hoping this will be a good solution.

How can we utilize view templates and title block parameters?

Do you use a view template on every view?

Why should you use one?

I am probably preaching to the choir on this one. View templates allow you to consistently control the visibility of multiple views simultaneously. I use a view template in almost every situation. One useful tip is that you can choose to not include some categories in your template, those can be controlled locally through VG.

What do you include in them?

Almost everything: model categories, annotations, filters, DWG links, RVT links, etc.

Are there situations where you are better off without one?

In a one-off situation or when messing with a working view which will not go on a sheet.

Title Block Parameters

Categories: instance, type, global

Depending on how you want to modify your title block, the different kinds of parameters have different uses.

When do you use each kind?

Instance parameters are good when the information per sheet will change. Some examples for what I use instance parameters are: sheet count, authors, or keyplans. Type parameters can be useful for when you want to change the information for the whole project. Some examples of what I use type parameters for are seals (when there is only one on per central model) and project status. Global parameters are mainly used to drive and report values between elements in a model, I'm not sure if these have a use in model management.

How to Treat DWG Links vs. Revit Links

What challenges are there with DWG links in lieu of Revit links?

When you have a DWG background instead of a RVT, it simplifies a lot. There are some added steps though. Matching a title block which was created in CAD can be very difficult. To control the visibility of the background, it is good to remove VG Overrides Import from your template. When the VG Overrides Import is not part of your template, you can use the Query tool to hide layers in your view. It is also a good idea to attempt to find an elevation and match that in your Revit model.

Helpful sites:**COBie:**

<http://www.biminteroperabilitytools.com>

<http://www.wbdg.org/resources/construction-operations-building-information-exchange-cobie#cfid>

<https://www.youtube.com/channel/UCFpzipx9RPXPtA5mAlAcGQ>

<http://au.autodesk.com/au-online/classes-on-demand/class-catalog/2016/revit/bu18897#chapter=0>

<http://www.lulu.com/shop/e-william-east-and-shawn-okeeffe-and-richard-kenna-and-emma-hooper/delivering-cobie-using-autodesk-revit-spiral-bound/paperback/product-23339659.html>

Dynamo:

<https://forum.dynamobim.com/> (Connect with me! Username: amvincent_heapy_com)

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