

AS479571

How to Manage BIM Content for Your Home-based Workforce

Shawn C. Zirbes
CTC Software

www.ctcsoftware.com

Learning Objectives

- Outline Revit® loadable content standardization practices
- Outline Revit project content standardization practices
- Define specific content distribution needs related to Revit
- Demonstrate workflows simplifying the entire process

Description

We have always had some Revit content management issues including how to maintain our shared parameters, libraries, schedules, typical details and how to get our teams to use these libraries. These issues were tough enough when most of us worked from the office. Now we have an even more challenging environment: a distributed, home-based workforce. We must find a long-term solution to be productive. If we had issues before, they are compounded by the lack of workflow control many of us now experience because of the dispersion of our workforce. Autodesk® has BIM 360®, is an excellent tool for project model sharing, but it does not solve the content management issues for a dispersed project team. This session will outline and demonstrate workflows that can be leveraged for both content management and the deployment of that developed content. We will talk through the issue and investigate options and workflows that can elegantly resolve the management and deployment issues we currently face.

Speaker(s)

Shawn Zirbes is the Technical Evangelist for CTC Software, Inc., in Minnesota. Since 2000 Shawn has been using all Autodesk® AEC software. He is an expert in planning and executing software implementations for the AEC industry, and defining workflows to afford an efficient design process. He has worked with a wide variety of clients ranging from commercial, residential, healthcare, and industrial design firms, their consultants and the building product manufacturers supplying the building materials for these projects. Additionally, Shawn's wide range of Building Information Modeling software and workflow knowledge is highly leveraged by CTC and their clients to design custom add-ins streamlining firm-wide workflows.

Outline

Best Practices Overview

Content Maintenance Workflows

Issues with Remote Workforce

Workflows to Distribute Content

Best Practices Overview

In order to make sure we are all 'On the Same Page' we are going to review what we perceive to be the general best practices for content management.

Shared Parameter File

A single shared parameter file is recommended for the entire firm. It may be necessary to have regional language specific shared parameter files, but as few as possible is desired. Since Revit is heavily dependent on the GUID in the shared parameter file, it is necessary to ensure a single source of truth for the entire firm. Having multiple shared parameter files opens the door to having conflicting shared parameter definitions.

Loadable Family Content

Ideally there would be a single library of all corporate content, managed by a team of corporate users experienced in the art and science of Revit family creation. This ideal world does not always exist. Often there are discipline specific libraries, or regional libraries, or project libraries, or client specifics, or, or... There are so many reasons companies give for maintaining multiple libraries. And, whatever your reason, it causes disconnection between the end users and their modeling practices

System Family Content

Again, as with loadable family content, in an ideal world, there would be a single container/warehouse file that holds all project hosted system family content. And, like Loadable content, firms often divide this single warehouse into multiple warehouses. Often for discipline splits, or to manage file sized of the warehouse projects. But again, this causes issues for the end users. They often will open multiple projects before finding the desired content and using 'Transfer Project Standards' to load it into their active project.

The fewer warehouses the better. Ideally, there would be a single warehouse model per language containing all corporate standards for all disciplines.

It may be necessary to silo some special cases where Clients demand something very specific to them.

Typical Schedules

Schedules, like system families can only exist in a project model. Thankfully, they are lightweight in a model. Still, maintaining schedules across multiple models can be difficult to manage and maintain. And users must go searching for the correct schedules in a project before fully loading them into their own.

Ideal practice here would be to retain all schedules in a single, language specific project model with all the system families of the same language.

Typical Details/Sheets

Once again, typical details can only exist in a Revit project model. Details are likely the largest of all common project hosted content, so these often get divided into multiple sum-warehouse files that end users get to dig through to attempt to find the correct one(s) to bring into their active model.

Ideal practice here would be to retain all details in a single, language specific project model with all system families of the same language.

Model/Detail Groups

Model Groups and Detail Groups have a slight advantage over other (typically) project hosted content. These groups can exist outside a project as their own project, but then the BIM Management must maintain standards across multiple groups files. It does make loading groups slightly easier for end users, but it becomes a BIM Management nightmare.

Ideally, these model groups would be maintained in a single project model with all the other System Family content, making standards management far easier.

Starter Projects

Starter projects, as opposed to typical Revit project templates, have some excellent advantages. All typical project standards can be incorporated in the starter project:

- Worksets
- Typical Linked Model Place Holders
 - All on the correct workset
- View Templates
 - Able to account for worksets and typical links
- Very Light Weight
 - No/Few system families
 - No Component families
 - Only typical Annotations loaded
 - Only typical views loaded
 - Model purged as far as is reasonable
 - Few to no sheets

“But, then users have to search for everything! And, load things from all of the above files we just agreed were cumbersome to leverage...” Etc... Etc...

True, true, but this section is discussing ‘Best’ practices in an ideal world. Later in this class/handout, we will discover how all of this can be made easier for both the BIM Manager and daily Revit users.

Content Maintenance Workflows

There is always more than one way to achieve something. There are always other tools and workflows that can be leveraged to achieve an end goal. Due to time, we cannot cover every possible way to do a thing, so to get through the entire workflow as efficiently as possible, There will be a single collection of tools represented. The Suites from CTC Software will be used to achieve the desired outcome.

Shared Parameter Management

As written above, a single shared parameter file per language is ideal. However, many of us have more than one now. Multiple files that have fragmented from each other over time, that

have been introduced by manufacturers or employees coming from other firms. Regardless of reason, multiple shared parameter files cause disruption in the standards of our libraries.

The Manual Method

The only real way to repair the multi-shared parameters issue is to inventory the files by opening them, figuring out potential conflicts and then establishing a single file from the many, throwing out the redundant and non-compliant.

This process is incredibly tedious and rarely happens because we do not have weeks of uninterrupted time to do this task.

The Automated Workflow

The best option is to allow the review of more than a single file at a time. While there may be a few options, this class will talk about one that can achieve what is needed in an easy and intuitive way. This class will show a potential workflow using the Shared Parameter Manager from CTC's BIM Manager Suite of tools.

This toolset allows:

- Side-by-Side comparison of 2 shared parameter files
- Ability to identify and isolate duplicates, conflicts, and unique entries between the files
- Ability to easily merge parts of 2 shared parameter files
- Ability to establish Revit Groups in the SP file quickly

Loadable Family Management

After updating the Shared parameter file, the entirety of the family library must be reviewed. Each family opened, and every intended shared parameter confirmed for compliance with the newly updated SP file.

The Manual Method

The opening and manual correction of shared parameters in use is done by editing from the family types dialog, selecting each parameter, editing it and updating its reference to the SP file. This is done one by one.

To be fair, no one has time for this, and even if it was attempted, it could take years of full-time manual work to execute on this task.

The Automated Method

The best option is to use a rules-based workflow to open and automatically correct each parameter, and at the same time, update Instance/Type settings, and even formulas.

This can be easily achieved by leveraging the Family Processor from CTC's BIM Manager Suite of tools.

Schedule Management

Schedules can be some of the more frustrating to fix. They only exist in project models, and to select the correct parameters, families with the correct parameters must be loaded in the model. This requirement is true if manually fixing or automating parts of the repair.

The 'Do Diligence'

The files that host the schedules need to be discovered. The more there are, the more tedious the full workflow is. We recommend maintaining as few files as possible (1-2 is ideal) to enable single source of truth. This single file will help later.

The Manual Method

Opening warehouse file(s) and templates containing Schedules. Check each parameter used in the schedules to validate proper connection. This often involves playing parameter roulette. The selection of multiple parameters because there is more than one with the same name, then removing the ones not needed. After this, the headers and groups of schedules need to be manually repaired, since the adding of parameters breaks Revit Schedule headers.

The Automated Method

Open the warehouse file(s) and use the Schedule Parameter Resolver from CTC's BIM Manager Suite of tools. This will allow direct selection of parameter for use in the schedule from the shared parameter file. This will eliminate the parameter roulette. Additionally, this will allow headers and groups to be retained, minimizing the work needed to repair schedules after the above 2 steps.

Detail Management

Typical details can often be one of the most tedious parts to maintain. These feel like a moving target at time.

The 'Do Diligence'

The files that host the details need to be discovered. The more there are, the more tedious the full workflow is. We recommend maintaining as few files as possible (1-2 is ideal) to enable single source of truth. This single file will help later. Combine these details into the same model(s) that the Schedules are in. This will provide a true single/few standards files(s) to maintain as time goes on.

Also, in this model, standard text types, dimension types, line styles/patterns and fill patterns need to be defined. These will be the foundation of the standards used in the warehouse and template.

The Manual Method

After combining, open each detail, updating text, lines, and fill patterns to match the defined company standards. Each view needs to be opened and the various types need to be investigated. There is no easy, automated way to find all types in the model for many of the drawn detail elements. Imported DWGs, detail groups, rogue line styles text types all need to be discovered and repaired.

The Automated Method

While this cannot be 100% automated, many of the detailing parts can be discovered and fixed using the Type Swapper from CTC's BIM Manager Suite of tools. This tool helps you discover line styles, text types, line patterns, fill patterns and dimension types across the entire model. Once these are presented in the list, they can be easily swapped and the types that are not desired can be removed in a single step.

The actual review of the typical details will still need to be done by hand, but at least the styles and types used in them will be far more standardized.

Project Standards Management

Other standards exist in the project. Various naming conventions, View port types, filter types, etc... These can be difficult to identify and can be difficult to update or sometimes even purge.

The ‘Do Diligence’

Once again, standards from across the office(s) need to be discovered, and ultimately combined into the warehouse file and template. And, once again, we recommend maintaining as few files as possible (1-2 is ideal) to enable single source of truth. This single file will help later. Combine these standards all into the same model(s) that the Schedules are in. This will provide a true single/few standards files(s) to maintain as time goes on.

Find/define all viewport types, filters, view templates, system families, model groups the firm needs. These should all be placed in the Warehouse file(s). Often it is easiest to generate the company standard template(s) from the warehouse once the cleansing is complete but get all of the standards first. Once all of this is acquired, the cleansing can begin.

The Manual Method

It is possible that issues were discovered while transferring all the things into the warehouse. Perhaps not... Either way, this single model now needs to be vetted for all naming conventions, settings, and constructions. Anything not needed should be discarded for good. All things kept must follow a clean consistent standard.

The manual method involves updating all naming and element retention by hand, one-by-one.

The Automated Method

There is a tool in another of CTC’s suites that allows the correction of standards based on rules. The Project Processor in CTC’s BIM Batch Suite can even open multiple projects and execute a number of corrections/purges/updates in a single process. This is like the Family Processor but is run against projects instead. As with Family Processor, the Project Processor can be structured to run specific steps in specific orders and may be used to run through a collection of projects multiple times depending on the desired outcome.

Miscellaneous Management Tasks

There are plenty of other management tasks. Most of these are going to require manual, hands-on work to complete. Be sure to write/record a list of industry specific or discipline specific items that this document has not included. As much as possible, it is important to keep standards in as few places as possible in as few files as possible to aid in the future maintenance of the collection of files.

Issues with Remote Workforce

VPN is too slow

VPN uses a ton of bandwidth. It makes it difficult to navigate the network and access files efficiently. And the more users there are attempting to use the corporate VPN, the more noticeable the degraded performance will be. Users generally do not like navigating the network across VPN because the navigation tends to lag quite a lot. Instead, many will begin to hold content on their local computers so they can avoid the VPN network lag. This leads to silos of content that are not aligned with the Corporate standards.

Virtualized computers

Virtualized computers can be a meaningful way to allow users to work remotely while still having good speed in accessing the network. This solution however can get expensive and can lead to

issues when scaling for an entire workforce. This solution also has the common issue of graphics that are not near as responsive as a physical workstation. This can be overcome with proper hosting hardware, but again, this may not be a cost-effective solution when early in the remote workforce planning stage.

Users who Silo

As mentioned earlier, users may be encouraged to silo when there is slow content browsing. Additionally, they may choose to silo anytime they found something that took a bunch of navigation, even if browsing was responsive, if users have to browse a lot, they will often silo to make access next time faster.

Again, as with the above comments, this creates a separate copy that is no longer aligned with the standard. And this can introduce issues in maintaining projects over time.

Workflows to Distribute Content

Content Management Systems

As with the maintenance tools above, there are many possible solutions that can achieve content management for end users. And again, we only have time to investigate a single option. This means that the opinions shared here are one point of view. Feel free to investigate other options. We will outline some things that we feel are important for consideration.

Online vs Offline

The content management tool you choose when working with a remote workforce should almost certainly have online file retrieval in some form to facilitate access from wherever the users work. BIM 360 is available online, so the content storage should also work in a similar way.

Additionally, many companies work with clientele who forbid use of BIM 360, or online file storage. This means that the CMS chosen should also segregate, yet still search, content that cannot be cached online.

And, above all, you should always maintain a copy of your own content in its original form on your network for ease of maintenance. You do not want to be held captive by a CMS that forces you to use their storage, even if it has a convenience here or there.

Basic Search and Filtering

If you cannot search and refine that search with meaningful filtering abilities, then what is the point of the CMS? If you can put a bunch of content in, but your users are unable to efficiently retrieve it, what is the purpose? The CMS you choose must be tuned to work with Revit, and it must be able to filter for Revit based information with little or no effort.

Search Automation

Searches that are run frequently need a way to be used without manually setting the criteria every single time. The ability to save searches and distribute them to the teams of users is essential to a quality CMS environment.

Content Storage Optimization

Some of the warehousing files we use can get big. Sometimes over 100 or 200MB. These files can be very slow to access if the entire file needs to be cached into memory. Often firms begin to trade off the ease of BIM management in a single larger model, for the ease of using that model by dividing into smaller, bite-sized file collections. Great for

the user, but far more inconvenient for BIM Management. The CMS you choose should allow for the best of both worlds. Managing a single large warehouse but automating the bite-sized pieces for the end users.

Usage Reporting

Distributing your content is important, but you also need insights on how your teams are using that collection of content. Analytics is becoming more and more important in today's working environment. It is especially important when our teams are working remotely. We do not get that human interaction to understand if our teams are frustrated with using the tools we've provided, or if they are using them at all. Analytics is imperative to improving the structure and health of your library.

An Option

CTC offers a toolset called HIVE. It has a few parts that are important to content, but the CMS portion is most relevant for this session. The HIVE CMS allows BIM managers to cleanly add and structure the content they want designers to use. Designers have an ease of finding anything they need from the content to which they have been granted access.

While there certainly are a few other tools in industry now, CTC's HIVE solution checks all of the boxes for most firm's content management requirements. And all features are included.

Conclusion

No commercials were intended. The intent here is to demonstrate that there are ways to better manage your content and distribute that content to your teams. We are just showing one tool collection that serves the workflow from beginning to end. Feel free to contact the vendor provided as an example here or investigate other's toolsets.

Whatever you do, do not struggle with manual management and distribution. Give yourself and your users a way to be more efficient all the way through the assembly of a Revit project.