AS122878

Linked Details Amongst Multiple Models in Revit Lab

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Learning Objectives

- Learn strategies for linking details for separate Construction Documents
- Learn strategies for linking building for a single set of Construction Documents
- Understand the pros and cons of each strategy
- Link details so a single change will update all projects

Description

Working on campus projects, strip malls, or any multi-building project inevitably brings up the discussion of how to manage the details. Often a major driving factor in choosing how to manage the details depends on if all of the buildings will be included in one set of construction documents, or if each building will be a separate set of documents. Based on the project and which of the two previously mentioned approaches is selected, there are a number of strategies that can be implemented within Revit to help streamline the construction document process. This class will dive into creating a single project file that only contains typical details, and how to link that file into all pertinent building models so that they all update seamlessly. This process isn't well known but can keep the liability aspect of a project to a minimum.

Speaker

Known as "The Revit Geek", Brian has spent more than 25 years in the industry, more than 10 of which have been focused on Revit. Over a decade of working with Architects and Engineers to advance BIM in their companies, Brian started his BIM consulting company in 2011 to focus on custom high-level training/mentoring. Brian has clients all over the US/Canada that generally tolerate his sarcastic nature in exchange for his wide breadth of BIM knowledge. Brian showcases his love of talking about Revit, or maybe just his love talking, in a monthly light-hearted, occasionally irreverent, free Q&A webcast, Revit Radio.

Brian is a regular speaker at many conferences, including Autodesk University, BIM Workshops and BiLT, where he has been awarded top speaker several times. Brian and his wife, who met at AU, welcomed Vienna in 2013, for a total of three daughters and in 2016 welcomed a son Paxton.

AUTODESK UNIVERSITY

Introduction

Method 1 – Copy Paste

A common way to add details into a campus type project is to detail in a single building file and then copy and paste those details into the other building files. With this method each detail can be on different sheets and have different detail numbers. The downside to this method is change; when a detail changes in one of the building files, it will have to be recopied and pasted, or the change will have to be made manually in all files.

Method 2 – Site File

Another method of detailing is to link all building files into a site file and then detail in the site file. All of the details are easily changed, yet must be on the same sheet and have the same detail number, even if referenced by several different buildings. All of the building views, such as floor plans, elevation, etc., must have different sheet numbers, etc. Depending on the project type, the file can be too large to work efficiently.

Method 3 – Dummy Sheets

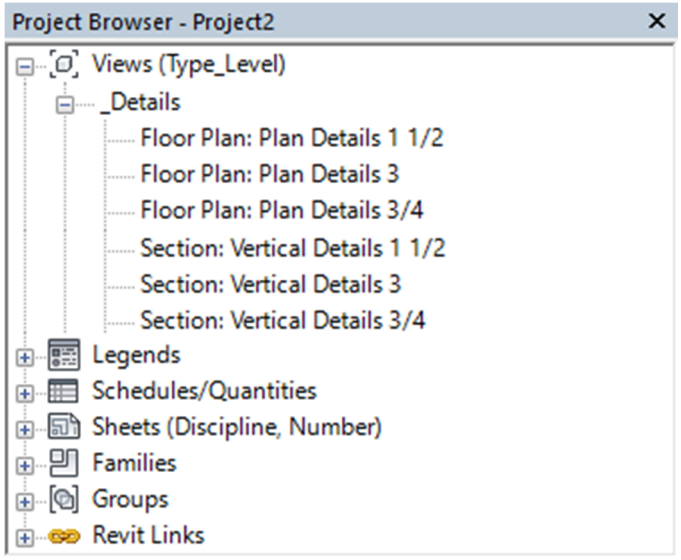
Having all the details in one of the building files and creating dummy sheets, dummy details, and then using those to fill out call out bubbles and sections is another common practice. This is nice because the details exist only once, thus making it easy to update. However, if a detail is moved from one sheet to another then all the building files will have to have the dummy view moved as well. Details must have the same sheet and detail number from building to building. If this is the method of choice, an option to make this process easier is to consider using the program AutoLink from Revolution Design.

Method 4 – Linked Detail File

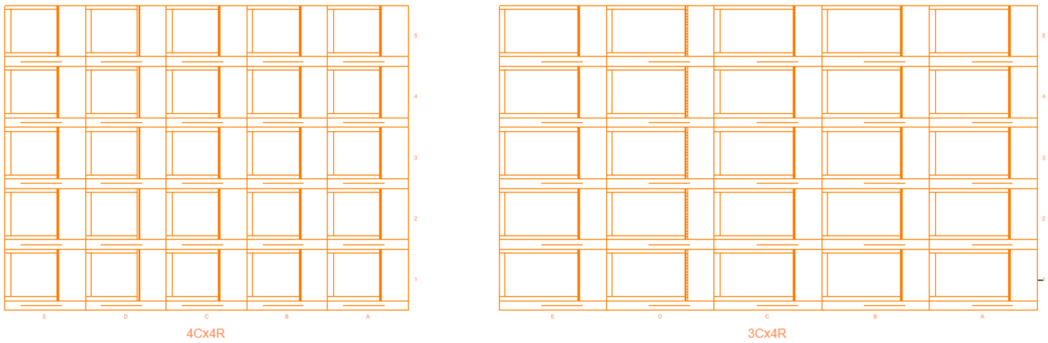
Linking details between separate Revit files on a multi-building project is a lesser known/utilized process than some, but if done correctly, it is a process that can work well. For this to process to work, a detail file that contains only details is required. The key to this is to draft the details on plans and sections rather than in drafting views. It is also required to create different views for each scale, which will help in the file organization. Once the detail file is created, it will be linked into the building files, then when details are created within the individual projects, those file's views will be set to display the linked view instead of the host view. By doing this it will be possible to cut details, utilizing reference other view, and have them point to a view in the model which displays the nested details. All changes to details will have to be carried out in the detail file, then updates will be pulled through to the building models. This process will also allow an individual to create details outside of the project and manipulate them without affecting any of the model elements in the building file. This process is the most flexible for view location and numbering, but requires a great deal of upfront set up. However, if this set up is part of a company template then the setup must only happen once. If a company chooses to utilize this workflow on all projects, both multi-building and single building projects, then all the standard details may be generated in this manner. If that was the case, the detail file would be copied to all project folders. Utilizing this method could improve the speed of the project file since not as many families would be loaded into the project (they are instead in the detail file), and that detail file could also be unloaded, or on a workset that is not always opened. This document will discuss this method, as well as how to prepare a project with the method in mind.

Detail File

Setting up the detail file is the most critical step in making this process successful. Creating the detail file in the proper manner can be somewhat tedious, but the initial effort pays off in the end. The counterintuitive part in this step is that all the detail views will not be drafting views. If the project will require plan details, then these details MUST be created in a floor plan view. If the details will be in a vertical view (elevations/building sections/details), then they MUST be created as a section view. Also, take into consideration the scale of the views, since this is important so text and dimensions will display properly once in the host model. In the detail file, there will be separate plan and section views for each potential detail scale, and all details of the corresponding type and scale will exist on one view.

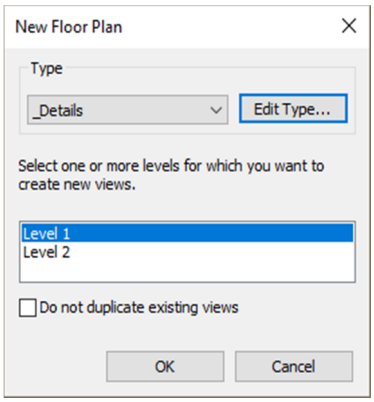


In each of the views it is good practice to use a guide to understand the required size and location of the detail. This guide is usually a generic annotation family which will act as a guide for the detail size and assist in placement in the project file. A sample file may be downloaded from my site http://bdmackeyconsulting.com/detailing-guide-grid/. (this sample is family has parameters that will allow it to be set based on the size of a title block) The way these are placed in the view doesn't have to match any particular sheet size, it is merely a reference for size and scale. Adding text to describe the type of details in each given area also helps when the file is referenced into the project model. The number of guides added to each scale view is entirely dependent upon the needs of the project. The template file may have many more that is needed on a typical project, but since this is a bit tedious, it may be easier to delete what isn't needed rather than add more.

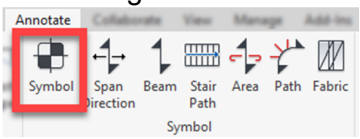


Steps for Generation Plan Details

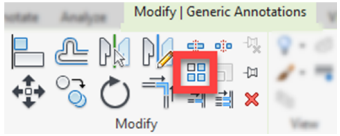
1. Open the file “Nested Standard Details 2018”
2. In the detail file, create a new floor plan for Level 1
   a. View Tab >> Create Panel >> Plan Views drop down >> select Floor Plan
   b. In the "New Floor Plan" dialog, select the appropriate view type (this example uses _Details), if needed un-check "Do not duplicate existing views", then select Level 1
   c. Select OK
   d. Once the views are created, set the scale to 1 1/2"
   e. Rename the view to Details Plan 1 1/2"



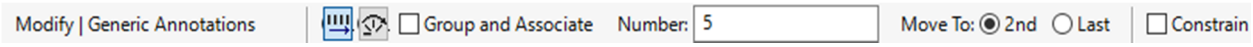
3. Generate a layout for drawing details and ease of organizing and finding
   a. Annotate Tab >> Symbol Panel >> Symbol Command
   b. In the “Type Selector” select the family “Sym Detail Guide: 3Rx3C”
   c. Place this family at the intersection of Grid A and Grid 1 & Grid Z



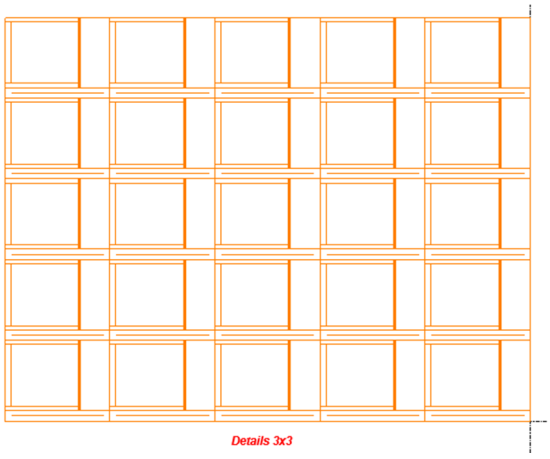
4. Select the previously placed Detail Guide family
   a. Modify Tab >> Modify Panel >> Array



   b. Options Bar >> Uncheck Group >>Set the value to 5



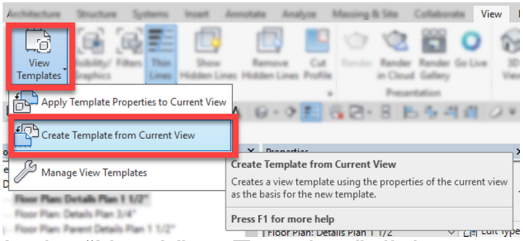
   c. Select the lower right corner of the Detail Guide as the start point for the array, then select the upper right corner for the end point of the array
5. Select all 5 of the detail guides and array repeating the steps above, this time array them to the left with a quantity of five.
6. Add text for a description of the type of details
   a. Annotate >> Text >> Text
   b. In the “Type Selector” select the type “Project Notes 1”
   c. Place the text below the arrayed detail guides and label the text “Details 3x3” The result should look as follows….



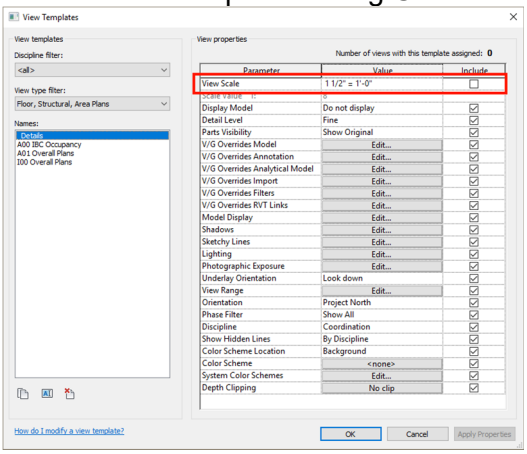
7. Since not all the details will fill the same area on a sheet repeat steps 1-5 for “Sym Detail Guide: 2Rx3C”. Instead of placing these items on the grid intersection place them just to the left of the last grouping
8. Adjust visibility setting by typing in “VG”
    a. Model Tab
        i. Select the “All” button
        ii. Uncheck one of the checked categories
        iii. Select “None”
        iv. Check “Detail Items” and “Lines” categories
    b. Annotation Tab
        i. Select the “All” button
        ii. Uncheck one of the checked categories
        iii. Select “None”
        iv. Check “Callouts”, “Detail Item Tags”, “Dimensions”, “Generic Annotations”, “Grids”, “Reference Planes”, “Sections”, “Spot Elevations”, “Spot Slopes”, and “Text Notes”
    c. Analytical Model Categories Tab
        i. Uncheck the “Show analytical model categories in this view” button
9. Change the following values in the view properties
    a. Display Model = Do not display
    b. Detail Level = Fine
    c. Discipline = Coordination

Once these settings have been adjusted, this view may be used to generate a view template

10. View Tab >> Graphics Panel >> View Template Drop Down >> Create View Template from Current View



11. In the “New View Template” dialog enter the Name: _Details
12. In the “View Template” dialog Uncheck the View Scale button



13. Select “OK”

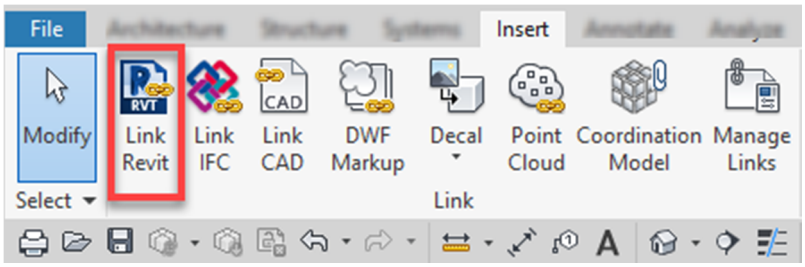
Generating a View Template doesn't automatically apply the template to the view. It will need to be set in the view properties.

14. In the View Properties apply the newly created view template

These steps have generated the template for plan details at a scale of 1 ½" = 1'-0". All of the steps above will need to be replicated for any other desired scale. These steps will also need to be repeated for all vertical details, these will be done in section views. This file does have others views created and set up.

15. In one of the areas created add detail items such that it resembles a detail in a building file. (10 Minutes)
16. Save and close the detail file

Project File



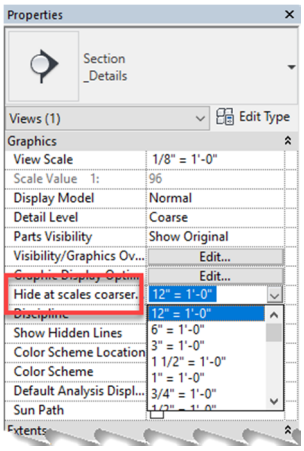
Once the detail file has been created, it will then be linked into each of the project files (ideally this would be done in a template before the individual building files are generated). If the linked detail file is placed on its own workset, then the visibility of that workset can be set to be not visible in all views, which will help keep the building files from displaying unintended information from the detail file in non-detail views (i.e. grids or reference planes). Another advantage to putting this file on a workset is the workset may be closed when opening the project files, which will increase the speed of those files. If a single user file is being used then the visibility issue may be accomplished with phasing, design options, or simply with view templates

Steps for Linking in the Detail Model

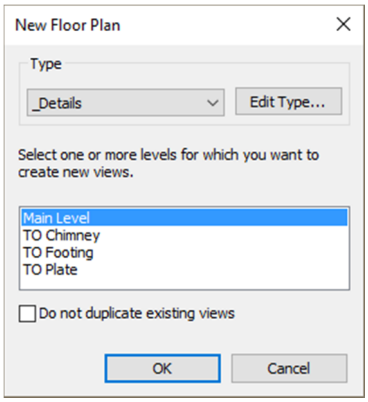
1. Open the file “Building A 2018”
    a. These files have been submitted to AU via the e-transmit command. The “Detach from Central” & “Create new Local” buttons should be greyed out while the detach button should be checked.
    b. If this is not the case then simply check the “Detach from Central” button and in the “Detach Model from Central” dialog choose the first option “Detach and preserver worksets”
2. Create a new workset
    a. Collaborate Tab >> Manage Collaboration Panel >> Worksets
    b. In the Worksets Properties dialog select “New”
        i. In the “New Worksets” dialog
            1. Name: Links Details
            2. Uncheck “Visible in all views”
    c. Select OK
    d. For “Specify Active Workset” select Yes
3. Open Floor Plan view Main level
4. Link in the detail file
    a. Insert Tab >> Link Panel >> Link Revit
    b. Select the “Nested Standard Details 2018” file
        i. Leave the Positioning to Origin to Origin
        ii. Select Open
    c. The file will not be visible as the workset was set to not display in all views by default. This is covered in the steps below, if there is a desire to see the file in the current view, change the setting of the workset in Visibility Graphics. Since there isn’t anything modeled in the detail file the only thing that will be visible are the grids and reference planes.

Creating Views for Details in the Building File

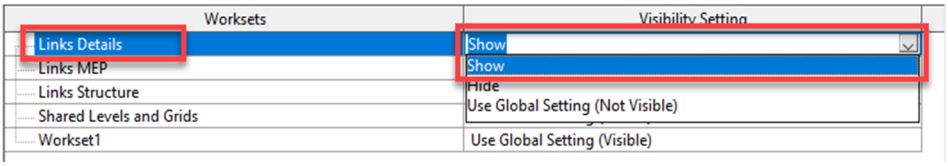
Once the detail file has been linked into the project, views must be created, then those views need to be set such that they pull through the details from the linked detail file. Like the detail file, none of the views will be drafting views, they will have to be plan and/or section views since only those views are allowed to show linked file views. One way to carry this out in an organized fashion (so there aren't hundreds of plan and section views in the project) is to create a parent view for each scale then to duplicate plan and section views as dependents. One final item to consider is to change all the section views such that their section markers will not appear everywhere in the project. To do this, adjust the "Hide at Scales Coarser Than" setting in the section views (this value may not be added to a view template). Alternatively, view filters may be utilized to not display a specific view type, and that filter would have to be added to all view templates for RCP, Plans, Sections etc..



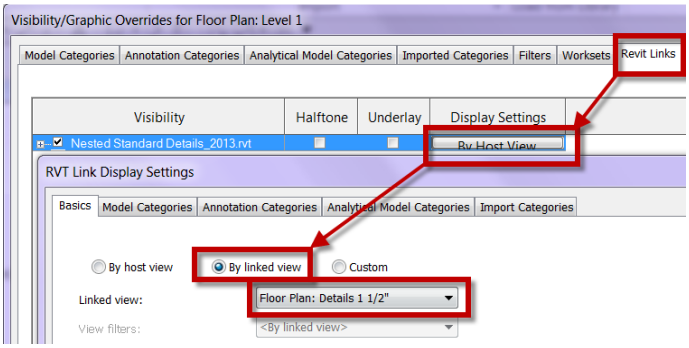
Steps for Parent Plan Detail View



1. In the building file, create a new floor plan for Level 1
    a. View Tab >> Create Panel >> Plan Views drop down >> select Floor Plan
    b. In the "New Floor Plan" dialog, select the appropriate view type (this example uses _Details), then un-check "Do not duplicate existing views", then select Main Level
    c. Select OK
    d. Once the views are created, set the scale to 1 1/2"
    e. Rename the view to Parent Plan Details 1 1/2"
2. Open the Visibility/Graphics Dialog
    a. Go to the Worksets tab (if this is a work shared project)
        i. Change the Visibility Settings to "Show" for Linked Details workset



b. Go to the Revit Links Tab
   i. Click on the button in the Display column labelled By Host View
   ii. Set the radio button on the top to By Linked View
   iii. In the linked view property, select Floor Plan: Details Plan 1 1/2"
   iv. Select OK



c. Model Tab
   i. Select the "All" button
   ii. Uncheck one of the checked categories
   iii. Select "None"
   iv. Check "Detail Items" and "Lines" categories
d. Annotation Tab
   i. Select the "All" button
   ii. Uncheck one of the checked categories
   iii. Select "None"
   iv. Check "Callouts", "Detail Item Tags", "Dimensions", "Generic Annotations", "Grids", "Reference Planes", "Sections", "Spot Elevations", "Spot Slopes", and "Text Notes"
e. Analytical Model Categories Tab
   i. Uncheck the "Show analytical model categories in this view" button

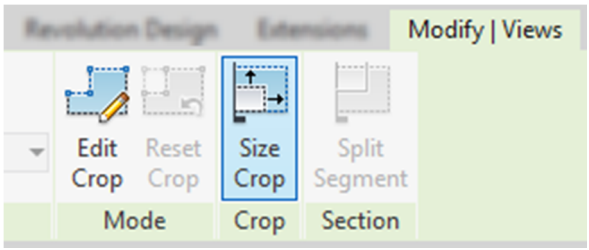
3. Change the following values in the view properties
   a. Display Model = Do not display
   b. Detail Level = Fine
   c. Discipline = Coordination
   d. (***Hint: steps c&d may be accomplished by a view template***)
4. Click OK

These steps including creating new parent views, will need to be repeated for each scale that is being used in the detail file.
(***Hint: Since the detail file is linked, and it has a view template for details, the "Transfer Project Standards" tool may be utilized to bring in the view templates. However, all of the view templates in that file will come across. The template may not have all the same setting for a project file but may be good starting point.)***

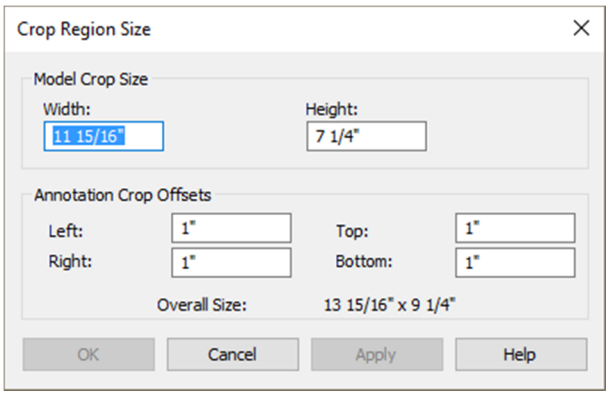
With the plan views created, a dependent view is required for each individual detail on the linked file's parent view.

Steps for Dependent Detail View

1. Open a recently created plan view from the project browser
    a. View Tab >> Create Panel >> Duplicate View drop down >> select Duplicate as Dependent
    b. Rename the view
2. Select the Crop Region in the recently created Dependent View
    a. Contextual Ribbon (Modify|Views)>>Crop Panel>>select Size Crop



    b. In the Crop Region Size dialog change the settings to match the size of the detail box in the linked file.



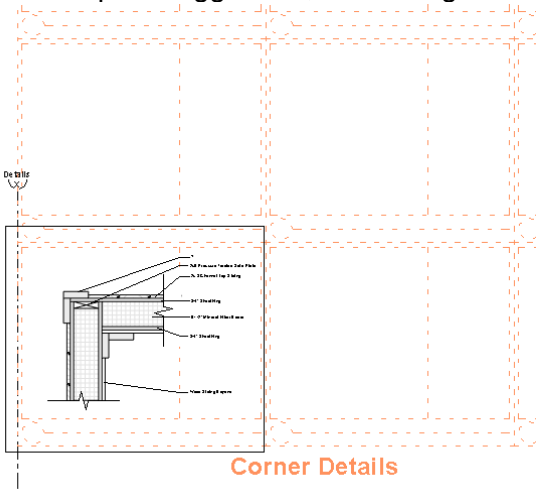
    c. Move the crop region to align with the appropriate linked detail box. (***Hint: the annotative crop region may be selected as a base point of reference. This may be snapped to the corner of the detail box, then move the crop region to match the settings in the Annotation Crop Offsets. This will be difficult while the view is still cropped, uncheck crop view to assist in the moving process***)
3. Open the recently created dependent view and create a dependent view from it.
    a. Select this view and simply move it to match the size of the detail box
4. Repeat as required for each of the nested detail boxes.
    a. Dynamo may be utilized to help automate some of this process

The above process will only allow a floor plan to show a linked view from another floor plan. Since most projects also have vertical details, we will need to repeat the above processes for section and elevation views. One minor issue when creating vertical type detail views is that they will have a marker show for every detail view created. There are several ways this issue can be resolved, such as Phasing, View Filters, or Hide at scales, just to name a few. If these details are created as elevation views, then they will not be able to be referenced in an elevation view as a detail bubble or section head, therefore all vertical views should be done as sections views.

Steps for Parent Section Detail View

1. Create a new section view
    a. View Tab >> Create Panel >> select Section
    b. Click on the screen to place a section
    (This must be parallel to the direction the details were placed in the linked detail model.)
2. Go to the properties Dialog box
    a. Rename the view to Details Section 1 1/2" Parent
    b. Change the Hide at scales coarser than value to 12" = 1' - 0"
    c. In the View Template property set the scale value to 1 1/2"
3. Right click on the view Details Section 1 1/2" Parent (the view created above)
    a. Select Duplicate View >> Duplicate as dependent
    b. Right click on the new view, select rename, and change it to match a detail name
    c. Adjust the crop region to fit the detail view as described in the step for the plan views
4. Repeat this process for as many details as needed

When both plan and section views are created, text or generic annotation families from the linked detail file will either be displayed in full, or will disappear completely. When this occurs, “annotative crop” is the property that will need to be addressed. With annotative crop turned on, the generic annotations and text will only display if it is entirely in the annotative crop region, so with this option toggled off, all of the generic annotation families will be displayed.



Placing Views on Sheets

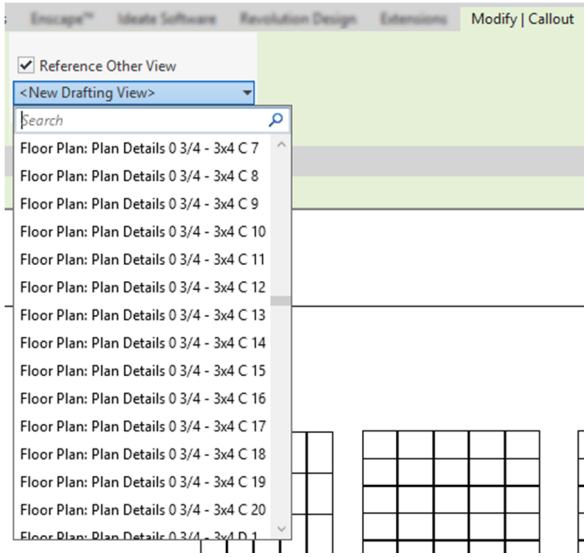
Since each of the details are now their own view, they may be placed on sheets. Once this process is done for multiple building files it doesn’t matter what sheet or detail number the views end up being. It may vary from building file to building file, or some details may not be needed in a given file.

Place Reference View

Once created, the detail views can be referenced throughout the project, as well as placed on sheets. This process is called "reference other view" and is similar to placing normal views, with one possible exception: instead of creating a new view, a new section or callout will reference an existing view.

Steps for Referencing the Linked Details

1. Create a linked plan callout
    a. Open a floor plan
    b. View Tab >> Create Panel >> Callout
        i. Verify Plan View is selected in the type selector
        ii. Contextual ribbon>> check Reference other view
        iii. In the drop down, select the appropriate view
        iv. Draw the size of the callout on plan
2. Create a linked elevation or section callout
    a. Open an elevation or section view
    b. View Tab >> Callout
        i. Contextual ribbon>> check Reference other view
        ii. In the drop down, select the appropriate view
        iii. Draw the size of the callout in elevation



Testing the Magic

All of these steps have been done in the file “Building A 2018”, however there is also a file “Building B 2018” where this has already been completed. This is where the one can witness the power of linking details files.

Steps for seeing the payoff

1. If still in the building file Synchronize and/or Save then Close the file ***(Hint: in Revit 2017 the shortcut key Ctrl+W was added for Close)***
2. Open the file “Nested Standard Details 2018”

   a. Change any and/or all of the details
   b. Save and Close the file
3. Open the file "Building A 2018" ***(Hint: for entertainment say abracadabra while waiting on the file to open, or at least think it)***
   a. Go to the Parent View of the details that were changed
   b. Verify the changes
   c. Open a sheet the detail was placed on
   d. Verify the changes
4. Open the file "Building B 2018" ***(Hint: here is a link to the song Abracadabra: Steve Miller Band)***
   a. Go to the Parent View of the details that were changed
   b. Verify the changes
   c. Open a sheet the detail was placed on
   d. Verify the changes

As you can see, setting this up is a somewhat tedious process. However, if this is set up as an office standard and placed in the templates, then the daily user will think it is magic, or at least those who have had to do it with a different process.

Conclusion

This session introduced a way of using details in Revit for a multi-building project. This process allows details to update in many building files without having to copy them from project to project, while maintaining linked callout bubbles that are live and intelligent. Although there is initial work involved, for large campus-type projects, there is great potential for this process.

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