

Optimizing the Design Development Stage using Revit Architecture

Douglas Bowers, AIA, LEED® AP – Doug Bowers Consulting, LLC

AB1851 The Design Development stage of a building design is an important time for refining the building design for meeting requirements, but also when good communication with the client is crucial in getting their approval. This class will demonstrate ways of using Revit to make sure that you are fulfilling the design criteria through verifying space usage per the program, addressing room occupancy, and visually coordinating fire rated walls and doors. We will also show how to communicate the design with the client through Room Data Sheets, 3D plans per floor, floor plan shadowing, color schemes, and other methods.

Learning Objectives

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

- Configure a view to show the room occupancy for each room
- Create a custom schedule to verify space usage relationship to the program
- Create 8-1/2" x 11" Room Data Sheets
- Create visually impacting floor plans

About the Speaker

Doug Bowers has been a speaker at Autodesk University for multiple years and enjoys using his teaching and professional experience to make his classes both informative and enjoyable. He currently provides education and implementation services for Revit®, AutoCAD® Architecture, AutoCAD®, and Navisworks® and works extensively with designers and manufacturers in creating Revit® family content. As an independent design software consultant and a registered architect, Doug Bowers combines over 30 years of architecture/engineering/construction (AEC) experience with over 20 years of experience in managing and/or consulting in the use of various design software packages. His unique combination of experience provides him insight into the needs of the various team members involved in the design and construction of a project, and the knowledge of how to apply technology to assist them. Doug is a LEED AP BD+C, holds various Autodesk certifications, and writes an AEC industry blog. His past includes being a VAR Senior Consultant, Director of CAD Technology for a 16 office architectural firm, and the AEC Technical Editor for the AU Quarterly Newsletter.

Doug@DougBowersConsulting.com

Blog: <http://aectechtalk.wordpress.com>

Twitter: @DBCdoug

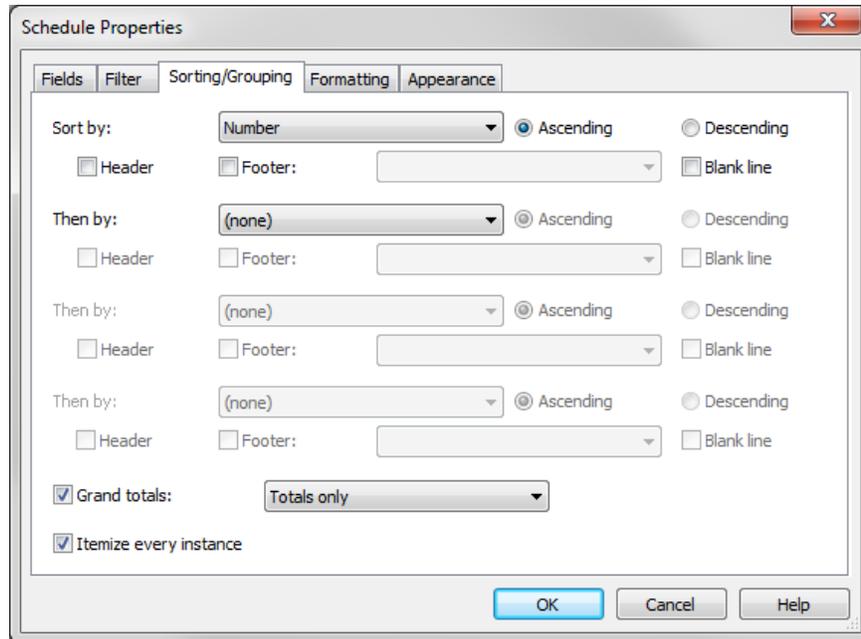
Create a Room Area Schedule that compares Program to Actual Area for each room:

As the building is divided into rooms with walls and room separator lines, actual room sizes become defined. Since the floor plan is continually modified to create a functional and code-compliant layout, room sizes continually change and sometimes become quite different than the desired area as established in the Program of Requirements.

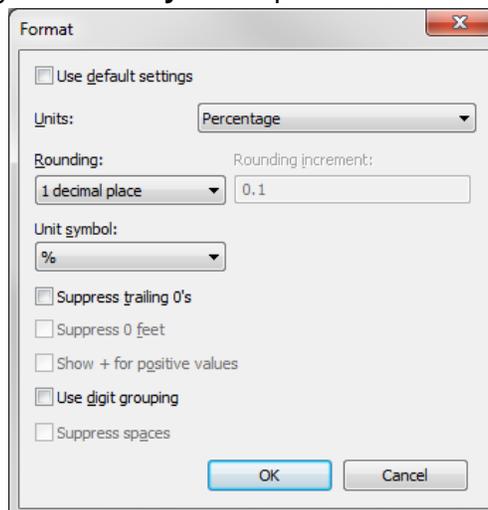
Having a schedule that displays both the Actual area and the Program area is a great way to ensure that the actual room sizes remain near the program room sizes. The following steps show how to create a schedule that not only shows actual and program areas for a room, but also shows the difference in both actual area and a percentage relationship. Since projects typically desire that the actual area be within 10% of the program area, we will have the schedule flag the rooms in red that are not within the 10% tolerance.

Before beginning the process, create a new Shared Parameter named **Program Area** as an **Area** type of parameter. Add this new Instance based shared parameter as a Project Parameter and assign it to the **Room** category so that all rooms will have this available as a parameter.

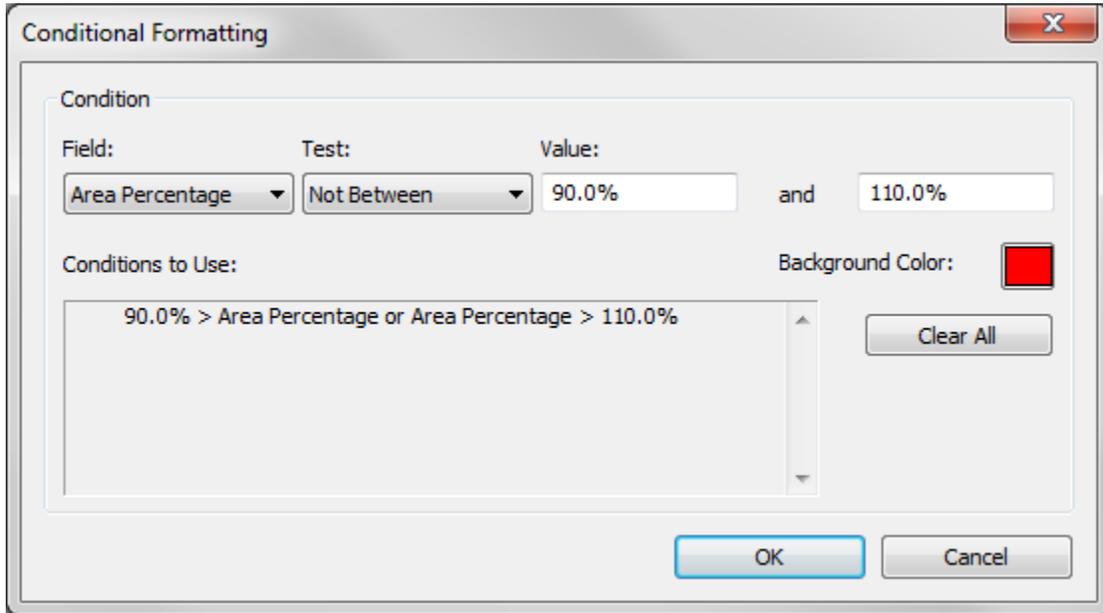
1. On the ribbon, go to the **View** tab and select the **Schedules** function from the **Create** panel. From the drop-down list, select the **Schedule/Quantities** option.
2. In the **New Schedule** dialog box, select Rooms from the **Category** section and name the schedule something like **Room Area Schedule**. Pick the **OK** button.
3. In the **Schedule Properties** dialog box, choose the following **Available fields**:
 - a. Name
 - b. Number
 - c. Area
 - d. Program Area
4. Select the **Calculated Value...** button in the middle of the dialog box.
5. In the **Calculated Value** dialog box, give it a name of **Area Difference**.
 - a. Specify the **Type** as **Area**
 - b. Type in the **Formula** of **Area - Program Area** (this is case-sensitive)
6. Select the **Calculated Value...** button again.
7. In the **Calculated Value** dialog box,
 - a. Type the **Name** as **Area Percentage**
 - b. Specify the **Type** as **Number**
 - c. Type in the **Formula** of **Area/Program Area** (this is case-sensitive)
 - d. Pick the **OK** button.
8. In the **Schedule Properties** dialog box, go to the **Sorting/Grouping** tab.
9. Adjust the settings to match the following illustration.



10. In the **Schedule Properties** dialog box, go to the **Formatting** tab.
11. In the **Fields** area, highlight the **Area** parameter and place a checkmark next to **Calculate totals**.
12. In the **Fields** area, highlight the **Program Area** parameter and place a checkmark next to **Calculate totals**.
13. In the **Fields** area, highlight the **Area Percentage** parameter.
 - a. Place a checkmark next to **Calculate totals**.
 - b. Pick the **Field Format...** button.
 - i. In the **Format** dialog box, remove the checkmark next to the “**Use default settings**” option.
 - ii. Change the **Units** option to **Percentage**.
 - iii. Change the **Rounding** option to **1 decimal place**.
 - iv. Change the **Unit Symbol** option to **%**.



- c. Pick the **Conditional Format...** button.
 - i. In the **Conditional Formatting** dialog box, change the following conditions and set the **Background Color** to **Red**:
 1. Field = Area Percentage
 2. Test = Not Between
 3. Value = 90%
 4. Value = 110%



14. Pick the **OK** buttons to exit the dialog boxes.

The following is an illustration of the room analysis schedule:

Room Area Schedule					
Name	Number	Area	Program Area	Area Difference	Area Percentage
RECEPTION	100	479 SF	500 SF	-21 SF	95.8%
OPEN OFFICE	101	844 SF	850 SF	-6 SF	99.3%
CORRIDOR	102	343 SF	350 SF	-7 SF	98.0%
TRAINING ROOM	103	1028 SF	1000 SF	28 SF	102.8%
CONFERENCE	104	402 SF	400 SF	2 SF	100.5%
WORKROOM	105	428 SF	400 SF	28 SF	106.9%
STORAGE	106	384 SF	400 SF	-16 SF	96.1%
MEN	107	123 SF	120 SF	3 SF	102.7%
WOMEN	108	134 SF	150 SF	-16 SF	89.1%
OFFICE	109	133 SF	120 SF	13 SF	110.7%
OFFICE	110	127 SF	120 SF	7 SF	106.1%
OFFICE	111	127 SF	120 SF	7 SF	106.1%
MECHANICAL	112	121 SF	120 SF	1 SF	100.5%
		4673 SF	4650 SF	23 SF	

Configure a view to show the room occupancy for each room

Working with building codes is an important aspect of working as an Architect during the design stages of a project, and knowing the occupancy of each room is a key component to that aspect. The following process allows you to track the occupancy of rooms and have a tag that displays the occupancy load on a view.

Set up Parameters

Create the following **Shared Parameters**:

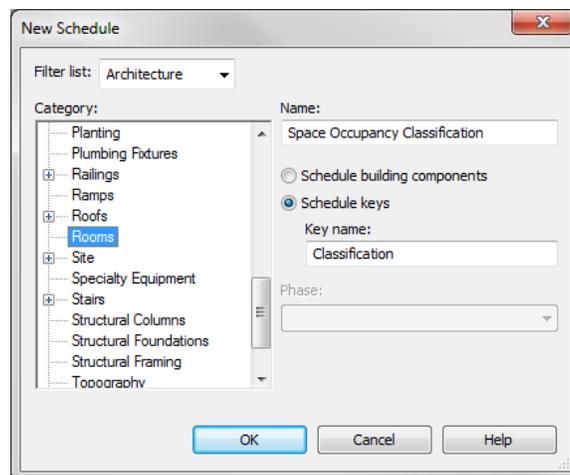
- **Occupancy Load Tag Value**
 - Type of Parameter = Integer
- **Non Calculated Room Area**
 - Type of Parameter = Area

Add the 2 above parameters and the 2 following parameters as **Project Parameters** and assign them to the **Rooms** category as **Instance** based. Go to the **Manage** tab and select **Project Parameters** from the **Settings** panel to assign them.

- **Area Per Occupant**
 - Type of Parameter = Area
- **Occupancy Gross or Net**
 - Type of Parameter = Text

Create a Key Schedule

Initiate the **Schedule** command from the **View** tab. Create a key schedule based on the **Room** category named **Space Occupancy Classification** with the key name of **Classification**.



Add the following previously created Instance based project parameters to the key schedule:

- **Area Per Occupant** – will be used in calculations in Occupancy Schedule
- **Occupancy Gross or Net** – will not be used for any automation, but for reference purposes only.

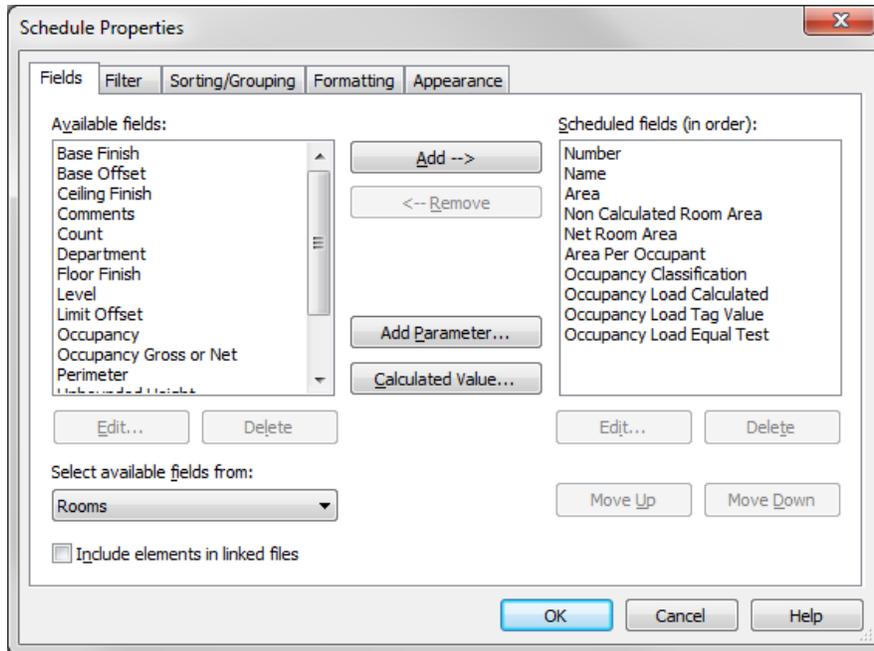
Add the classification information to the Key Schedule for the each of the classifications listed in the building code. (The International Building Code is used as an example.)

Space Occupancy Classification		
Classification	Area Per Occupant	Occupancy Gross or Net
Accessory storage areas, mechanical equipment room	300 SF	Gross
Agricultural building	300 SF	Gross
Aircraft hangars	500 SF	Gross
Airport terminal - Baggage claim	20 SF	Gross
Airport terminal - Baggage handling	300 SF	Gross
Airport terminal - Concourse	100 SF	Gross
Airport terminal - Waiting areas	15 SF	Gross
Assembly - Gaming floors (keno, slots, etc.)	11 SF	Gross
Assembly with fixed seats		
Assembly without fixed seats - Concentrated (chairs only-not fix	7 SF	Net
Assembly without fixed seats - Standing space	5 SF	Net
Assembly without fixed seats - Unconcentrated (tables and chai	15 SF	Net

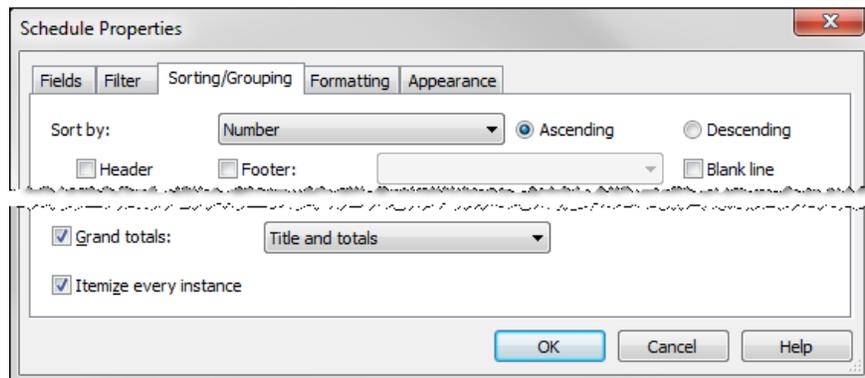
Create an Occupancy Schedule

Create a schedule based upon the **Room** category named **Occupancy Schedule** with the following **Instance**-based parameters:

- Name
- Number
- Area
- Non Calculated Room Area
 - This is for any area that should not be calculated as part of the room, such as casework. Manually entered to maintain integrity of Room object throughout room and working with MEP Space object for room.
- Net Room Area
 - Calculated Area type parameter with formula:
 - **(Area – Non Calculated Room Area)**
- Area Per Occupant
- Occupancy Classification
- Occupancy Load Calculated
 - Calculated Area type parameter with formula:
 - **Roundup(Net Room Area / Area Per Occupant)** 2012 and 2013
 - **(Net Room Area / Area Per Occupant) + 0.499** prior to 2012
 - 0.499 ensures that the value is rounded up to the nearest whole number
- Occupancy Load Tag Value
- Occupancy Load Equal Test
 - Calculated Area type parameter with formula:
 - **Occupancy Load Calculated = Occupancy Load Tag Value**
 - Parameter type: **Yes/No**



In the **Sorting/Grouping** tab, sort the schedule based upon the **Number** parameter and turn on **Itemize every instance**. Turn on **Grand totals** and set the option to “**Title and totals**”.



In the **Formatting** tab, checkmark the “**Calculate totals**” option for the **Occupancy Load Calculated** and **Occupancy Load Tag Value** parameters. This will give you occupancy load totals at the bottom of the schedule.

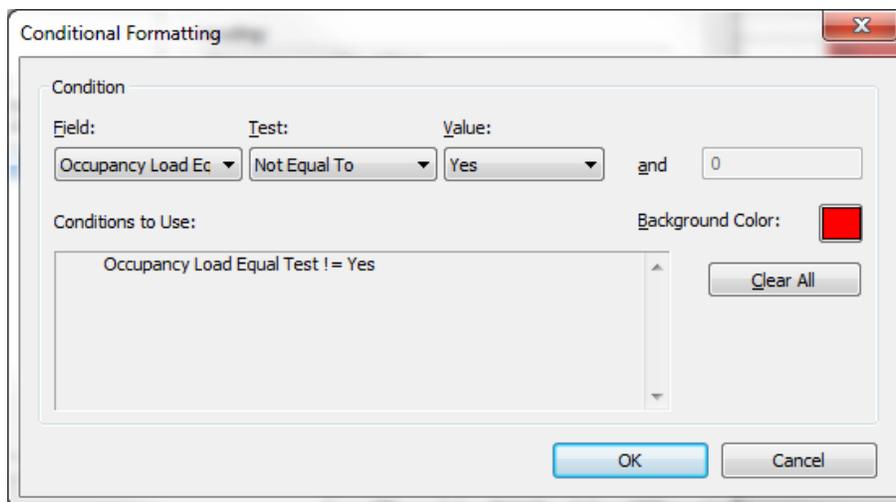
The rooms will need to have some value placed in the **Non Calculated Room Area** parameter for the calculations to work properly, even if the value is zero.

Occupancy Schedule									
Number	Name	Area	Non Calculate	Net Room Area	Area Per Occ	Occupancy Classification	Occup	Occup	Occupancy Load Equal Test
100	RECEPTION	479 SF	0 SF	479 SF	15 SF	Assembly without fixed	32	32	Yes
101	OPEN OFFICE	844 SF	0 SF	844 SF	100 SF	Business areas	9	9	Yes
102	CORRIDOR	343 SF	0 SF	343 SF	0 SF	Unoccupied - Corridors,		0	
103	TRAINING ROOM	1028 SF	0 SF	1028 SF	7 SF	Assembly without fixed	147	147	Yes
104	CONFERENCE	402 SF	0 SF	402 SF	15 SF	Assembly without fixed	27	27	Yes
105	WORKROOM	428 SF	20 SF	408 SF	15 SF	Assembly without fixed	28	28	Yes
106	STORAGE	384 SF	0 SF	384 SF	300 SF	Accessory storage area	2	3	No
107	MEN	123 SF	0 SF	123 SF	0 SF	Unoccupied - Corridors,		0	
108	WOMEN	134 SF	0 SF	134 SF	0 SF	Unoccupied - Corridors,		0	
109	OFFICE	133 SF	0 SF	133 SF	100 SF	Business areas	2	2	Yes
110	OFFICE	127 SF	0 SF	127 SF	100 SF	Business areas	2	2	Yes
111	OFFICE	127 SF	0 SF	127 SF	100 SF	Business areas	2	2	Yes
112	MECHANICAL	121 SF	0 SF	121 SF	300 SF	Accessory storage area	1	1	Yes
Grand total							252	253	

Unfortunately, since schedule calculated values cannot be added to tags, you will not be able use the **Occupant Load Calculated** value in a tag as desired. Hence, a workaround is required, so we will use a parameter that can be used in a tag.

The **Occupancy Load Tag Value** parameter that was added to the schedule is a parameter that can appear in tags. The problem is that it is a parameter that requires manually entered values and requires the user to type in values that match the **Occupant Load Calculated** values, which is error prone. To help with reducing errors, we will flag any rooms where those 2 parameters do not match.

The **Occupancy Load Equal Test** parameter that was added earlier will automatically say Yes or No as to whether those 2 values match. Since it is easy to lose track of which rooms have Yes or No values, we will make a conditional format to show that cell in red if it is No.



This effectively flags a room in red if the calculated room occupancy value does not match the manually entered room occupancy value.

While this method of displaying an occupancy load value in a tag is far from ideal, it does achieve the desired result on the views and enables the designer to track occupancy loads.

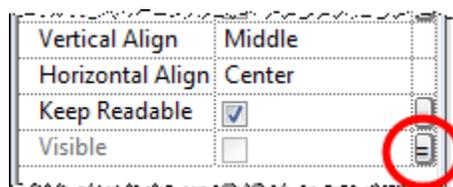
Notes:

- The built-in **Occupancy** parameter is a text parameter and not helpful in this process.
- Revit 2013 changed the conditional format function so that you cannot use a different parameter to control the format of a parameter. Prior to 2013, you could apply the above conditional format to the **Occupancy Load Tag Value** and the **Occupancy Load Calculated** parameters and have them appear red. That does not work with 2013.

Create a Room Occupancy Tag

Now that we have a schedule to track room occupancies, we can create a tag that can be placed on a floor plan view that shows the room name and the occupancy for that room.

- In the Project Browser, right-click on the **Room Tag** family (under Annotation Symbols) and choose to **Edit** the family.
- Select the **Label** function from the **Text** panel on the **Create** tab.
- Place the label as desired. In the **Edit Label** dialog box, select the **Add Parameter** button in the lower left corner and select the **Occupancy Load Tag Value** parameter.
- Back in the **Edit Label** dialog box, select that parameter and pick the **Add Parameter to Label** button in the middle of the dialog box. In the **Prefix** column, type **Occ =** (or whatever else you desire) and pick the **OK** button.
- Adjust the location of that label as desired for display purposes.
- Select the **Family Types** function on the **Properties** panel of the **Modify** tab.
- Pick the **Add...** button on the right side of the **Family Types** dialog box to add a new parameter named "**Show Occupancy Load**".
 - Type based
 - Type of Parameter: **Yes/No**
 - Group parameter under: **Graphics**
- Pick the **New...** button on the upper right corner of the **Family Types** dialog box to add a new type named **Room Tag with Occupant Load**.
- Place a checkmark next to the new **Show Occupancy Load** parameter so that this label will be displayed for this room tag type.
 - Make sure that **Show Occupancy Load** is not checkmarked for the other family types.
- Exit the **Family Type** dialog box.
- Select that new label and go to the **Properties** palette. Pick the button to the right end of the "Visible" option.



- In the **Associate Family Parameter** dialog box, select the **Show Occupancy Load** option and pick the **OK** button.
 - This ties the visibility of this label to the **Show Occupancy Load** parameter, so when that parameter is on, this label will be seen.
- Load this revised tag into the project with the **Load into Project** button on the **Family Editor** panel.
 - Select the “Overwrite the existing version and its parameter values” option if asked.
- The following illustrates the appearance of the tag in the project file:

TRAINING ROOM

103

Occ = 147

Creating a Color Scheme for Reviewing Occupancy-Related Codes

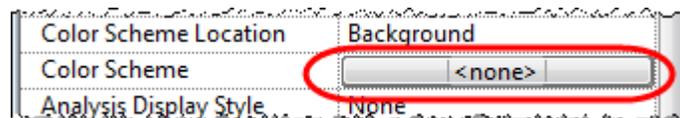
Having a Color Scheme applied to a code view assists in providing the designer with a visual representation of the code situation. This color scheme will utilize the Occupancy Load Value Tag name that is part of Rooms that have been placed in the model, so that information must be present in the project for color scheme to work.

This color scheme can be used in various ways, but for this example, we will use some occupancy load values that impact changes in design. The following ranges will be used:

- Less than **1** = Shows rooms that are unoccupied.
- At least **1** and less than **10** =
- At least **10** and less than **51** =
- At least **51** and less than **101** = Doors serving more than 50 occupants must swing in direction of exit travel and 2 exits are required
- At least **101** and less than **501** = Doors serving more than 100 occupants and capable of locking or latching must have approved panic or fire exit hardware.
- At least **501** and less than **1001** = Minimum of 3 exits are required
- **1001** or more = Minimum of 4 exits are required

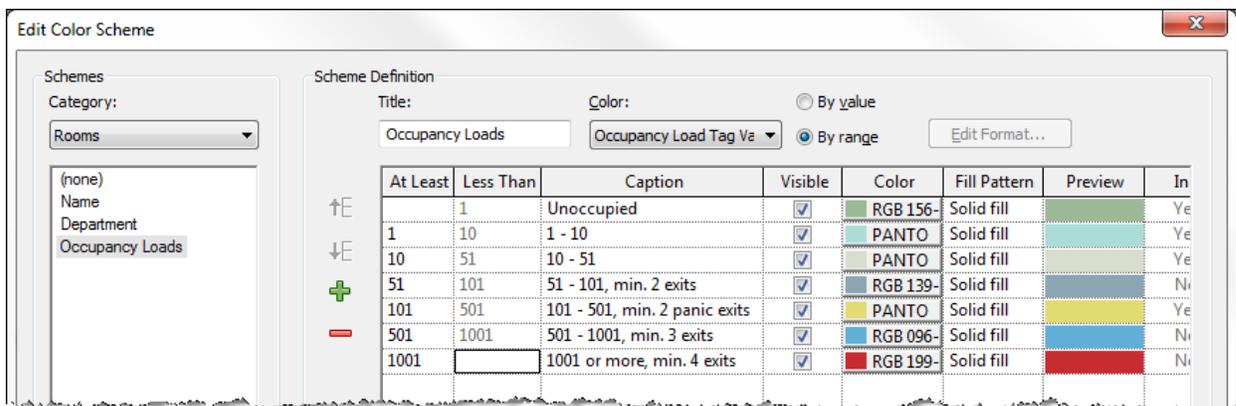
To create the color scheme:

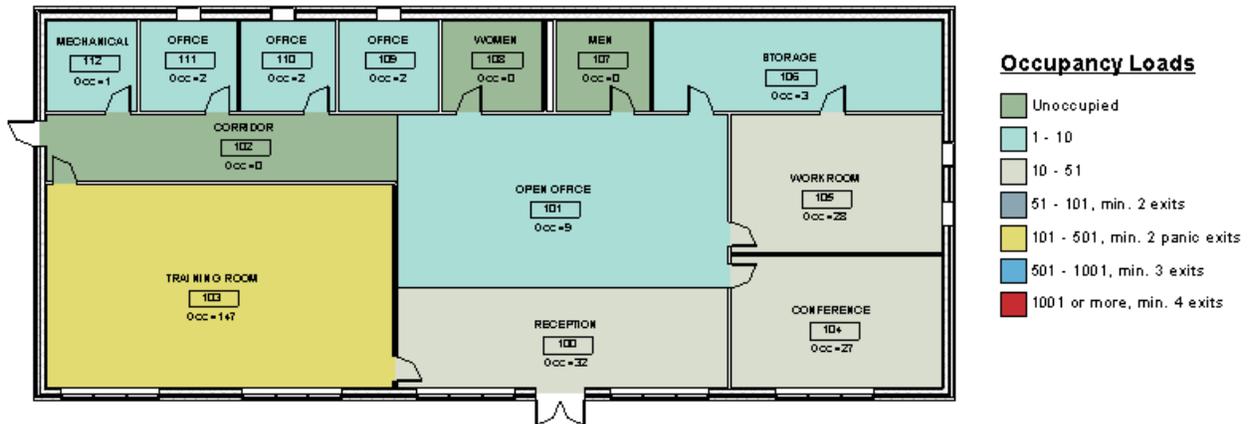
1. In the desired view, pick on the **Color Scheme** option in the **View Properties**.



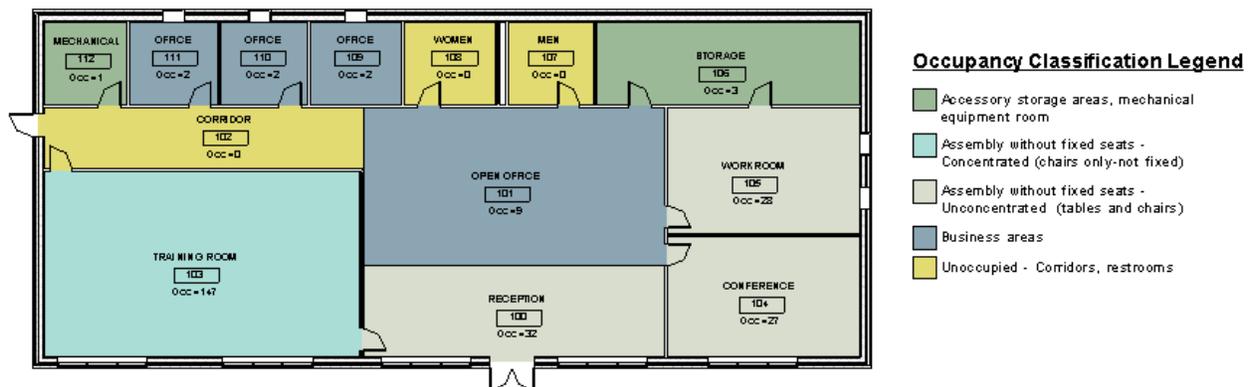
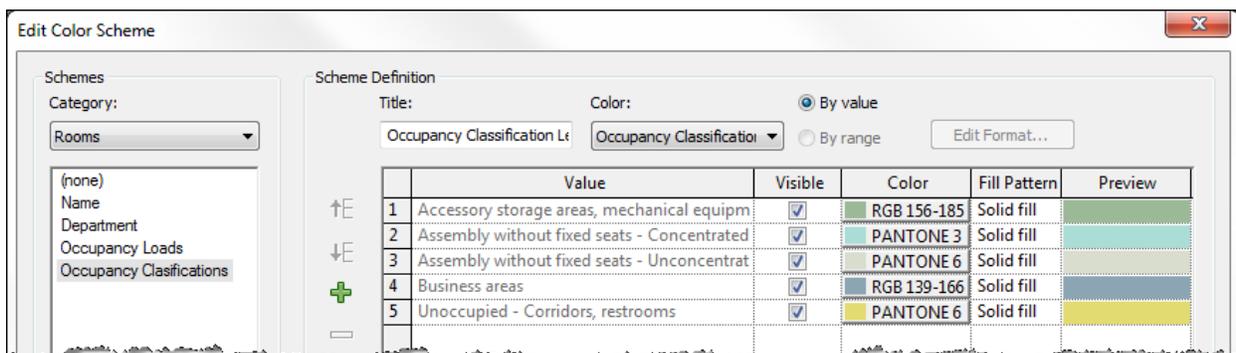
2. In the **Edit Color Scheme** dialog box, select the **Duplicate** button below the left pane.
3. In the **New color scheme** dialog box, name this new scheme **Occupancy Loads** and pick the **OK** button.

4. In the **Color:** dropdown box, select the **Occupancy Load Tag Value** option.
5. Select the **By Range** option at the top of the dialog box.
6. In the second row of the right pane area, type the number “1” in the cell in the first column, which has the heading of “**At Least**”. A “1” will appear in the cell directly under “Less Than”.
7. Pick the green plus symbol  in the center of the dialog box. (repeat for each new column to be created as shown in the following steps.)
8. In the 3rd row of the right pane area, type the number “10” in the cell in the first column, which has the heading of “**At Least**”. A “10” will appear in the 2nd row cell in the “Less Than” column.
9. In the 4th row of the right pane area, type the number “51” in the cell in the first column, which has the heading of “**At Least**”.
10. In the 5th row of the right pane area, type the number “101” in the cell in the first column, which has the heading of “**At Least**”.
11. In the 6th row of the right pane area, type the number “501” in the cell in the first column, which has the heading of “**At Least**”.
12. In the 7th row of the right pane area, type the number “1001” in the cell in the first column, which has the heading of “**At Least**”.
13. In the **Caption** column, enter **Unoccupied** for the first row. This is what will be displayed on the legend that will be placed on a view.
14. Continue to caption each row as you desire to see it displayed on the legend.
15. Still in the **Edit Color Scheme** dialog box, select the desired color to be used for each range. This color will be displayed on the legend and in each row that meets the criteria for that row.
16. Pick the **OK** button to exit the **Edit Color Scheme** dialog box when finished.
17. The active view will now be using the new color scheme that you just created.





The following is an example of a color scheme showing occupancy classification by room, which uses the **Occupancy Classification** parameter:



After creating the Color Scheme, you will want to add a Legend for the color scheme.

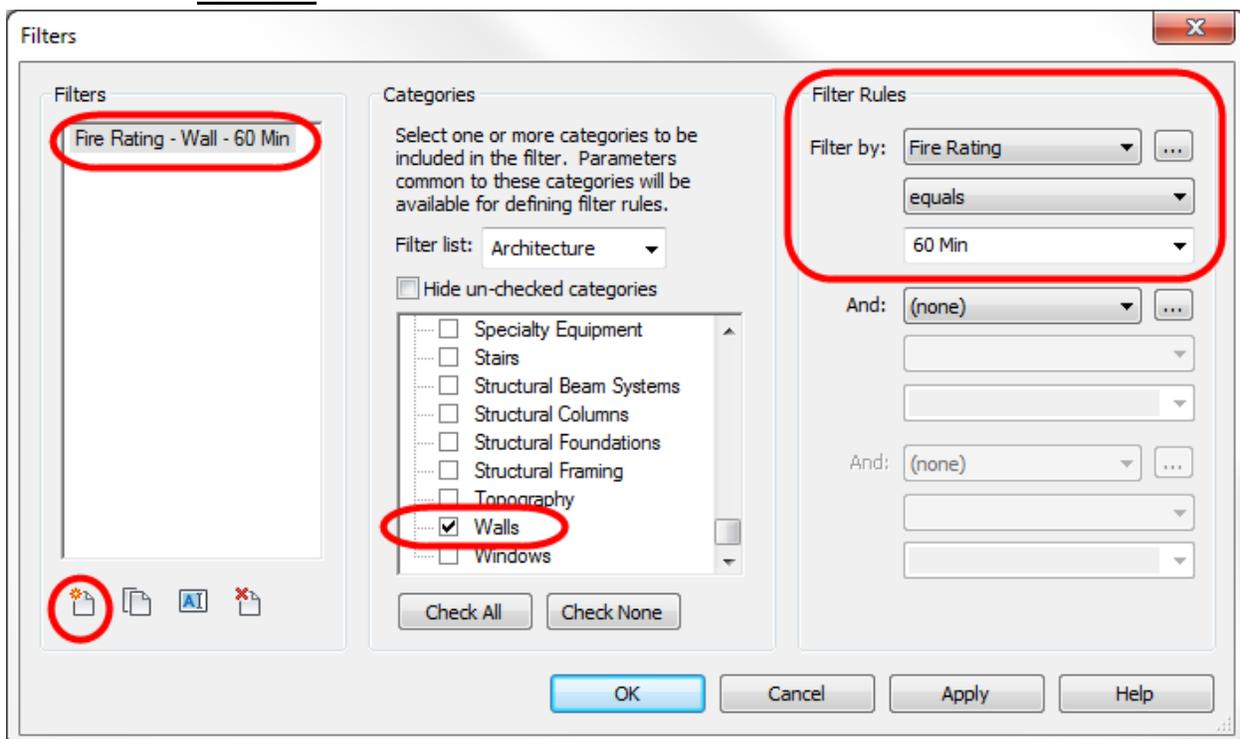
1. From the **Annotate** tab and the **Color Fill** panel, select the **Color Fill Legend** function.
2. Place the legend in the desired location on the view.
3. Highlight the legend and pick the **Edit Type** button in the **Properties** palette to modify the appearance of the legend.

Fire Rating Views in Revit

A very important aspect of designing and reviewing a building project is the code review process to ensure that walls, doors, windows, and other components have the proper fire ratings. Autodesk Revit makes it very easy to quickly visually check those fire ratings by setting up visibility filters. This portion will show you how to set up a fire rating view to display walls and doors as different colors depending on the fire rating parameter of the object.

Step 1: Create Filters for the various fire ratings

- On the **View** tab, go to the **Graphics** panel and select the **Filters** button.
- In the **Filters** dialog box, select the **New** button icon at the bottom left portion of the dialog box.
- In the **Filter Name** dialog box, type in a descriptive name for the filter as you may end up with many filters within a project. (I like to preface the name with the purpose of the filter to group similar filters.) For this example, type in **Fire Rating - Wall - 60 Min** and pick the **OK** button.
- In the **Categories** area of the **Filters** dialog box, scroll down and place a checkmark next to the **Walls** category.
- In the **Filter Rules** section, select the **Fire Rating** parameter, the **equals** qualifier, and then type **“60 Min”**.
 - It is extremely important that the “60 Min” value that is entered is **EXACTLY** the same as the parameter value that is entered for the object’s instance or type value. If this value does not match EXACTLY (including case), then the filter will not work.



- Repeat the above **New** filter steps for an addition wall filter, but change the **Filter Rules** value to be “**120 Min**”:
 - Fire Rating – Wall – 120 Min
- Repeat the above **New** filter steps for the following Filters, but use the **Door** category and using the appropriate value for the **Filter Rules**:
 - Fire Rating – Door – 90 Min
 - Fire Rating – Door – 60 Min
 - Fire Rating – Door – 45 Min
 - Fire Rating – Door – 20 Min
- After creating the various desired filters, pick the **OK** button to exit the **Filters** dialog box. These filters will now be available in any view in your project.

Step 2: Create a Floor Plan specifically for fire ratings review

- In the Project Browser, right-click on an existing floor plan which is similar to the desired fire ratings review plan.
- From the context-sensitive menu, select **Duplicate View -> Duplicate**.
- Right-click on the newly created view in the Project Browser and rename the view accordingly. For example purposes here, we will name the view “**Main Floor Fire Ratings Review Plan**”.
- I find it helpful to have the room names visible on the plan to ensure that I have proper fire ratings around special rooms, such as mechanical rooms. To add room tags to all of the rooms in the view at once, go to the **Home** tab -> **Room & Area** panel -> **Tag All Not Tagged** option and then choose the desired Room Tag from the dialog box.
- Create additional fire ratings review plans as necessary.

Step 3: Apply Filters to the view

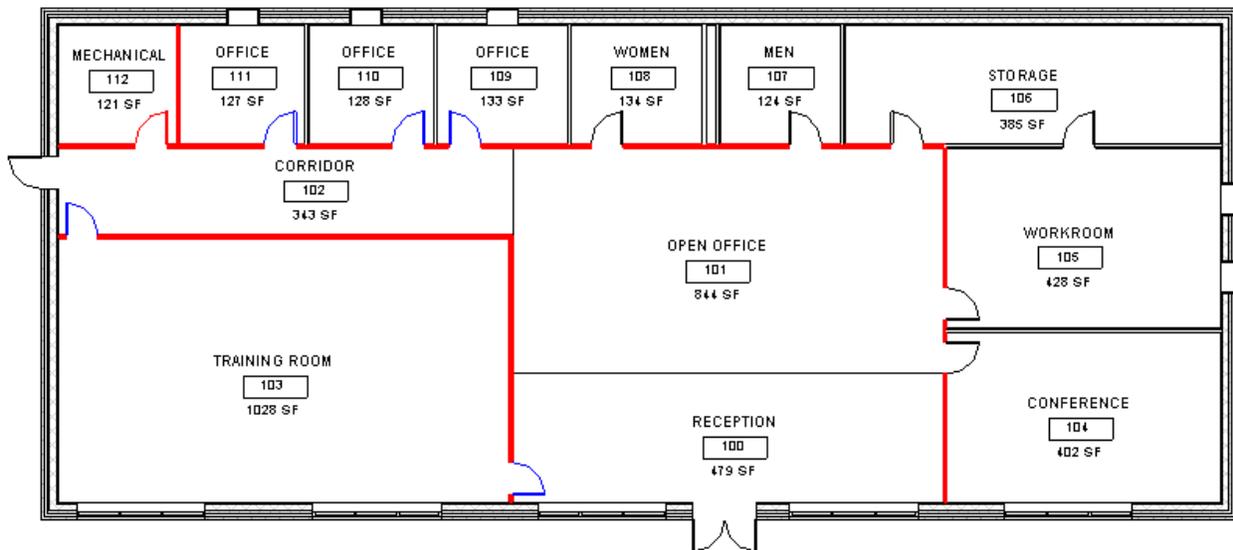
- Open the **Main Floor Fire Ratings Review Plan** view.
- Type **VV** or **VG** to enter the **Visibility Graphics** dialog box for the view.
- Go to the **Filters** tab of the **Visibility Graphics** dialog box and pick the **Add** button.
- In the **Add Filters** dialog box, select all of the Fire Rating filters and pick the **OK** button to add them to the view.
- Back in the **Filters** tab, make sure that the **Visibility** box is checked adjacent to each one of the filters. These will be checkmarked by default.
- Pick the **Lines** option under **Projection/Surface** for the **Fire Rating – Wall – 60 Min** filter.
 - When the **Line Graphics** dialog box appears, pick the button to the right of **Color** and change the color to **Red** instead of no Override. Pick the **OK** button.
 - When this is done for Doors, this allows the door swing to be seen as red.
- Pick the **Lines** option under **Cut** for the **Fire Rating – Wall – 60 Min** filter.
 - When the **Line Graphics** dialog box appears, pick the button to the right of **Color** and change the color to **Red** instead of no Override. Pick the **OK** button.

- Pick the Patterns option under Cut for the Fire Rating – Wall – 60 Min filter.
 - When the **Fill Pattern Graphics** dialog box appears, pick the button to the right of **Color** and change the color to **Red** instead of No Override. Pick the dropdown list next to **Pattern** and change the pattern to **Solid Fill**. Pick the **OK** button.
- Repeat the last 3 steps for each of the Fire Rating filters, but use different colors for each rating to make it easy to differentiate the various ratings.
- Pick the **OK** button to apply the filters and exit the dialog box.

Visibility/Graphic Overrides for Floor Plan: Main Floor Fire Rating Review Plan

Name	Visibility	Projection/Surface			Cut		Halftone
		Lines	Patterns	Transparen...	Lines	Patterns	
Fire Rating - Wall - 60 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>
Fire Rating - Wall - 120 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>
Fire Rating - Door - 90 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>
Fire Rating - Door - 60 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>
Fire Rating - Door - 45 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>
Fire Rating - Door - 20 Min	<input checked="" type="checkbox"/>						<input type="checkbox"/>

The following illustration shows 60 Min rated walls in red, 60 Min doors in red, 20 Min doors in blue, and unrated walls and doors in default black.

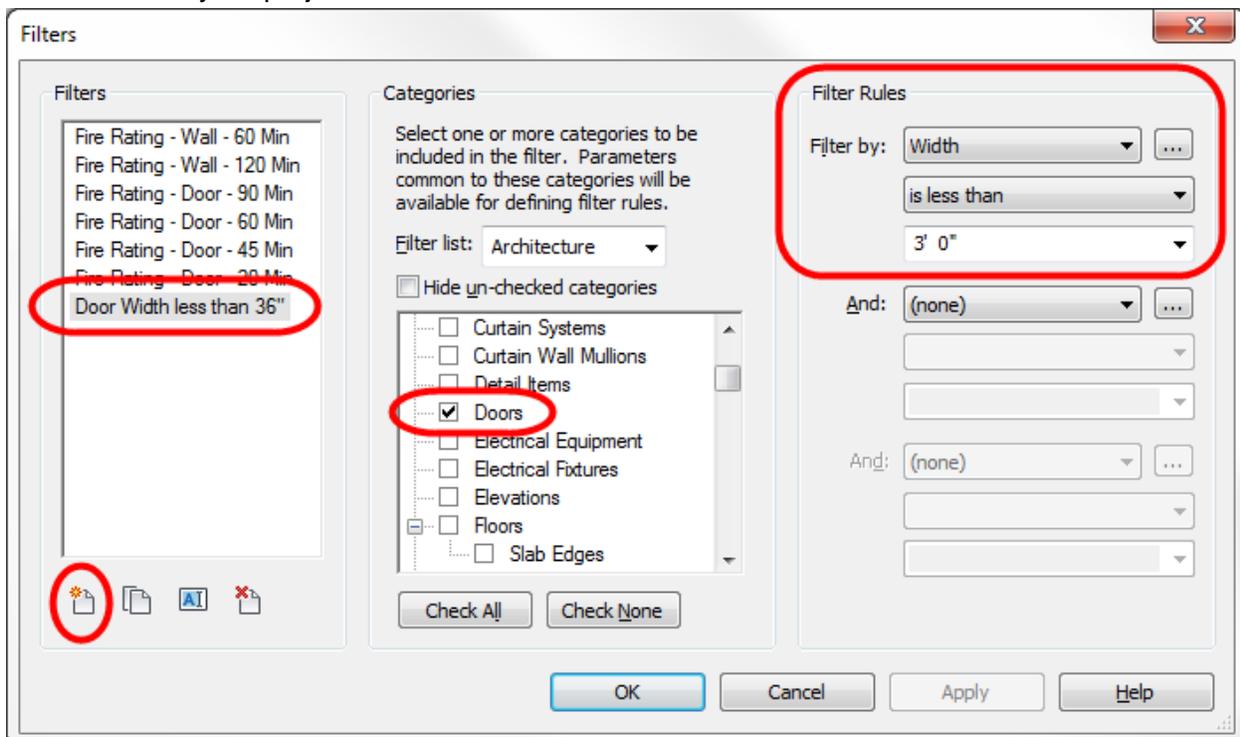


Locating Doors less than 3'-0" wide

Most doors on non-residential projects need to be a minimum of 32" clear to meet accessibility guidelines. To easily accomplish that width, most doors are placed as 3'-0" wide but some are placed as narrower doors. I like to be able to quickly visually check my floor plan to locate any doors that are smaller than 3'-0" to see if they are allowed to be less and to also check to there are locations where the door can be smaller than 3'-0". This portion will show you how to set up a filter to display in red any doors that are narrower than 3'-0".

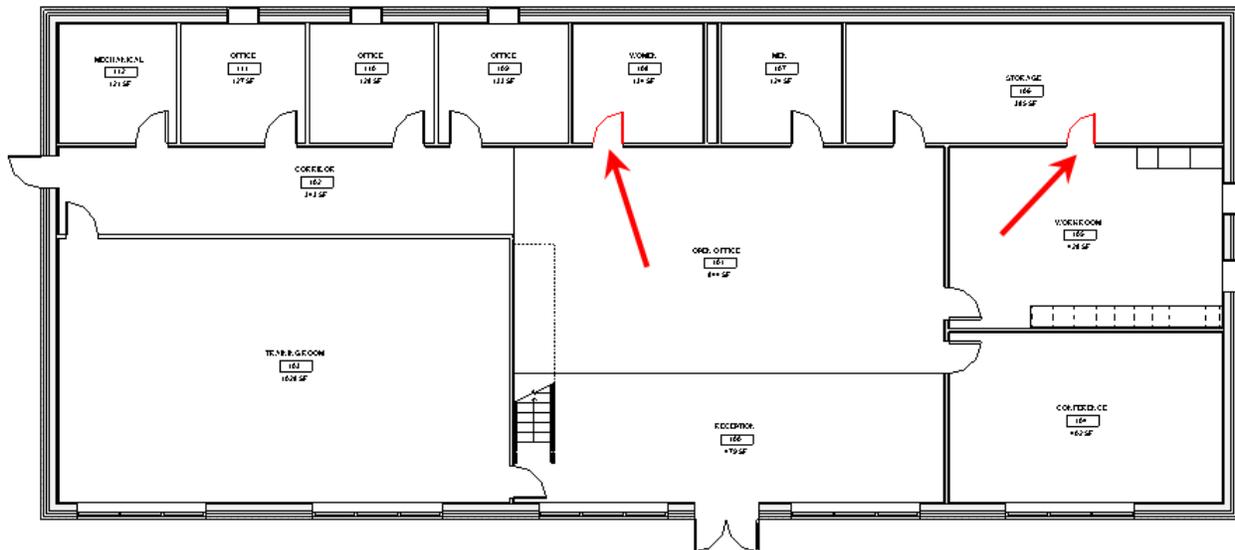
Step 1: Create Filter for the doors less than 3'-0" wide

- On the **View** tab, go to the **Graphics** panel and select the **Filters** button.
- In the **Filters** dialog box, select the **New** button icon at the bottom left portion of the dialog box.
- In the **Filter Name** dialog box, type in a descriptive name for the filter as you may end up with many filters within a project. For this example, enter **Door Width less than 36"** and pick the **OK** button.
- In the **Categories** area of the **Filters** dialog box, scroll down and place a checkmark next to the **Doors** category.
- In the **Filter Rules** section, scroll down and select the **Width** parameter, the **"is less than"** qualifier, and then type **3'**.
- Pick the **OK** button to exit the **Filters** dialog box. This filter will now be available in any view in your project.



Step 2: Apply Filter to a view

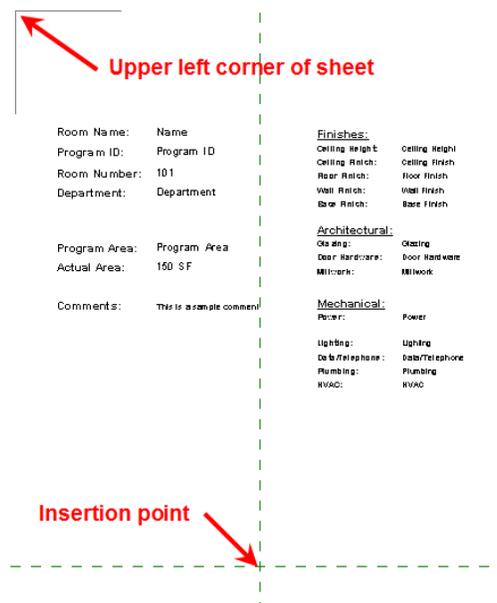
- Open the desired floor plan view.
- Type **VV** or **VG** to enter the **Visibility Graphics** dialog box for the view.
- Go to the **Filters** tab of the **Visibility Graphics** dialog box and pick the **Add** button.
- In the **Add Filters** dialog box, select the **Door Width less than 36"** filter and pick the **OK** button to add it to the view.
- Back in the **Filters** tab, make sure that the **Visibility** box is checked adjacent to the filter. This will be checkmarked by default.
- Pick the **Lines** option under **Projection/Surface** for the **Door Width less than 36"** filter.
 - When the **Line Graphics** dialog box appears, pick the button to the right of **Color** and change the color to **Red** instead of no Override. Pick the **OK** button.
 - This allows the door swing to be seen as red.
- Pick the **Lines** option under **Cut** for the **Door Width less than 36"** filter.
 - When the **Line Graphics** dialog box appears, pick the button to the right of **Color** and change the color to **Red** instead of no Override. Pick the **OK** button.
- Pick the **OK** button to apply the filter and exit the dialog box.
- Any doors which are less than 36" in width are now displayed in Red color.



Creating a Room Data Sheet:

1. Create a Room Tag that has room data information.

- a. Create a new **Annotation** family using the **Room Tag.rfa** template.
- b. Add labels for each of the desired parameters that are to be shown on the room data sheet.
 - i. On the **Home** tab, select the **Label** command from the **Text** panel.
 - ii. On the **Properties** palette, select the desired label type, or create a new type with the desired characteristics.
 - iii. Place the label and the **Edit Label** dialog box will appear.
 - iv. In the **Edit Label** dialog box, select the desired parameter in the left pane and pick the **Add parameter(s) to label** button in the middle of the dialog box.
 - v. Pick the **OK** button to exit the dialog box.
 - vi. Repeat the previous 5 steps for each desired parameter. Multiple parameters cannot be selected at once or they will all appear in one label.
- c. Add text titles for each of the labels that were added to the room tag.
 - i. On the **Home** tab, select the **Text** command from the **Text** panel.
 - ii. On the **Properties** palette, select the desired text type, or create a new type with the desired characteristics.
 - iii. Place the text on the room tag as desired for each of the parameter labels that were placed.
- d. Arrange the text and labels as desired, positioned so that the insertion point will end up being in the room in the view when this room tag is placed on a room view.
- e. Use invisible lines to make a reference for insertions so that all room data information location will be consistent on all sheets. This could be linework that would be at the upper left corner of the final 8-1/2" x 11" sheet.
- f. Note that you need to make sure that shared parameters listed on the Room Data Sheet are added to the project via Project Parameters.



2. Create a special title block for an 8-1/2" x 11" sheet

- a. Create a new **Titleblocks** family from the **A - 11 x 8.5.rft** template.
- b. If desired, adjust the title block perimeter lines to be a portrait format instead of the default landscape format.
- c. Add labels for each of the desired project and sheet parameters that are to be shown on the room data sheet.
 - i. Use the **Label** command from the **Text** panel on the **Home** tab similar to the process in Step 1 above.
- d. Add text as desired using the **Text** command from **Text** panel on the **Home** tab similar to the process in Step 1 above.
- e. Save the new title block family with a descriptive name.

3. Create a Floor Plan view with 1/8" scale view of singular room

- a. Go to the **View** tab and select the **Plan Views** option on the **Create** panel. From the dropdown list, select the **Floor Plan** option.
- b. In the **New Plan** dialog box, remove the check mark next to the "**Do not duplicate existing views**" option at the bottom of the dialog box.
- c. In the **Floor Plan views** area, select the level that contains the room on which you will be focusing.
- d. Pick the desired scale, which will likely be either **1/8"=1'-0"** or **1/16"=1'-0"** depending on the size of the room.
- e. In the newly created view, turn on the crop region and adjust the crop region boundary to display only the room which will be the focus of this view on the Room Data Sheet.
- f. Place the newly created Room Data Sheet room tag created in Step 1 above.
 - i. Go to the **Home** tab, and pick the **Tag** function from the **Room & Area** panel.
 - ii. When the **Room Tag** command is initiated, go to the element **Properties** palette and select the special room data sheet room tag from the list.
 - iii. Place the room tag so that the room is located in the desired location in relation to the room data information.
- g. In the **Properties** palette for the view, rename the view with a descriptive name that identifies the view with the specific room.
- h. Repeat the above steps for each room.

4. Create a sheet with title block and plan view

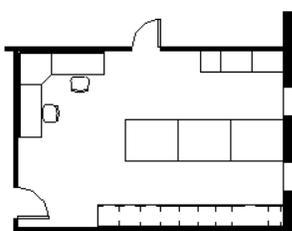
- a. In the **Project Browser**, right-click on the **Sheets** category and select **New Sheet** from the context-sensitive menu.
- b. In the **New Sheet** dialog box, select the Room Data Sheet Title Block that was created in an earlier step and pick the **OK** button.
 - i. If the appropriate title block is not loaded, pick the **Load...** button and load the title block family.

- c. In the **Project Browser**, drag the desired room floor plan to the sheet view that is displayed.
- d. Adjust the view on the sheet so that the reference lines of the view align with the sheet lines to create consistency between the sheets.
- e. In the **Project Browser** or sheet view **Properties**, rename the sheet as desired.
- f. In the view **Properties**, you may desire to remove the checkmark next to the **“Appears in Sheet List”** option.
- g. Repeat the above steps for each of the rooms that need a data sheet.
- h. Note that there are various ways to list the Room Data Sheets in a specific manner or category in the Project Browser. Please reference other resources for ways to organize the Project Browser.

Optimizing Design Development

Project Number: AB1851

<p>Room Name: WORKROOM</p> <p>Program ID: WKRM</p> <p>Room Number: 105</p> <p>Department: Support</p> <p>Program Area: 400 SF</p> <p>Actual Area: 428 SF</p> <p>Comments: THIS IS A SAMPLE COMMENT</p>	<p><u>Finishes:</u></p> <p>Ceiling Height: 9'-0"</p> <p>Ceiling Finish: ACT</p> <p>Floor Finish: VCT</p> <p>Wall Finish: PAINT</p> <p>Base Finish: VS</p> <p><u>Architectural:</u></p> <p>Cladding: EXTERIOR ONLY</p> <p>Door Hardware: LOCKSET</p> <p>Millwork: 8" TALL CABINETS, 18" COUNTER W/ CABINETS ABOVE & BELOW</p> <p><u>Mechanical:</u></p> <p>Power: 120V ABOVE COUNTER, 15" ELSEWHERE</p> <p>Lighting: FLUORESCENT</p> <p>Data/Telephone: 1 PHONE, 3 DATA</p> <p>Plumbing: NONE</p> <p>HVAC: STANDARD</p>
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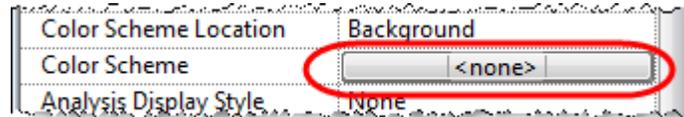
Reviewer's Approval Signature: _____ **Date:** _____



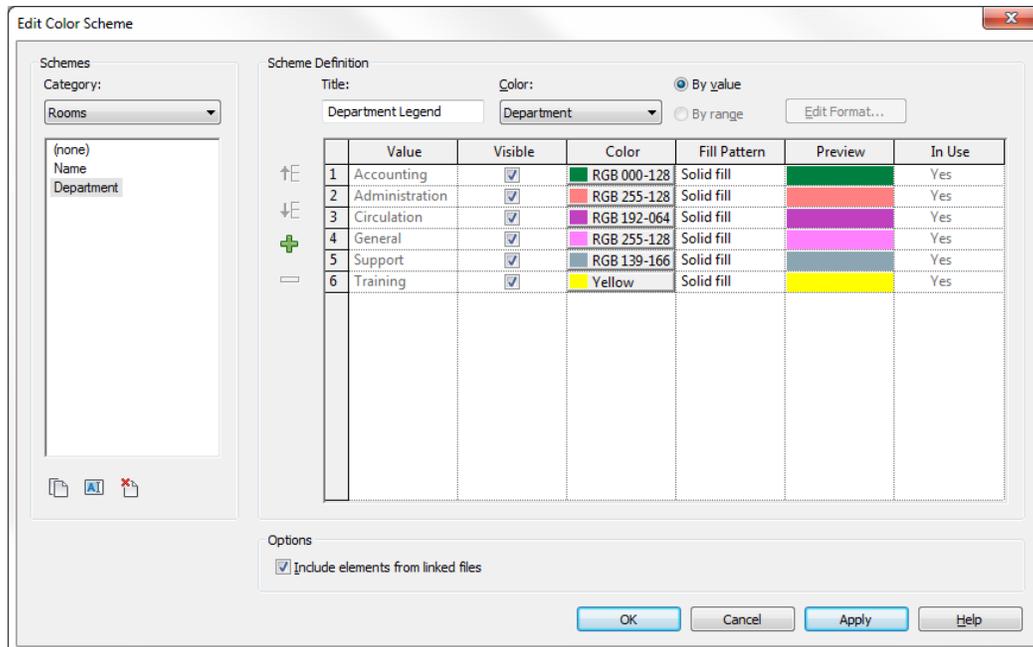
Creating a Color Scheme for Presentation View

Having a Color Scheme applied to a presentation view assists in providing clients with a clearer image of the relationship and locations of various departments. This color scheme will utilize the Department name that is part of Rooms that have been placed in the model, so that information must be present in the project for color scheme to work.

1. In the desired view, pick on the **Color Scheme** option in the **View Properties**.



2. In the **Edit Color Scheme** dialog box, select the **Department** scheme listed in the left pane.
3. Pick the green plus symbol  in the center of the dialog box.
4. In the **New Color Scheme Entry** dialog box, type one of the department names that you are using in the project. Pick the **OK** button.
5. In the **Edit Color Scheme** dialog box, select the desired color for that department.
6. Proceed to use the green plus symbol to add each of the departments that will be used.
7. Pick the **OK** button to exit the **Edit Color Scheme** dialog box when finished.
8. The active view will now be using the new color scheme that you just created.



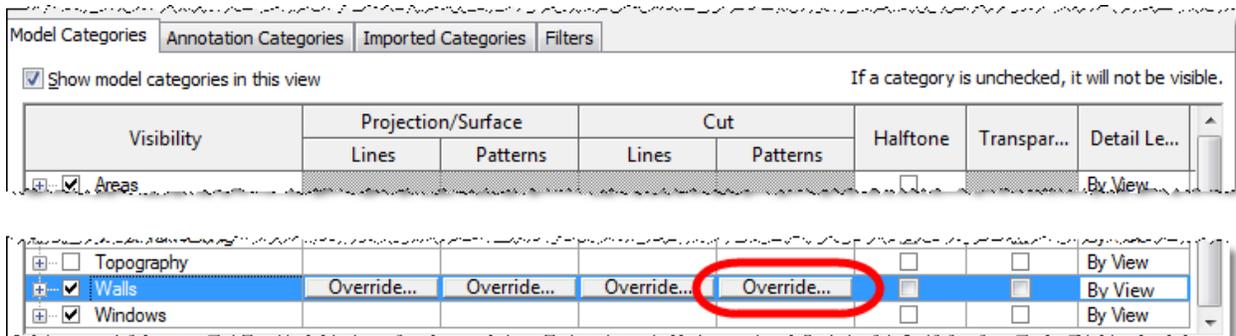
Conveying Floor Plan Design to Client

Conveying the design to clients is also an important part of the design stage. In addition to renderings, it is important to show the clients the floor plans in a way that they can understand it and make it clearer.

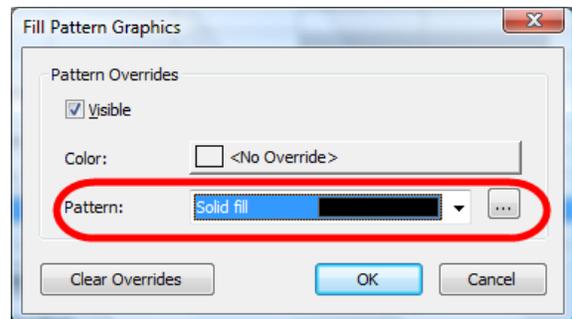
Using color schemes as noted earlier is a good way of showing correlation of rooms and departments to the client. Some other ways of enhancing views are:

Change the view to have the walls shown as solid filled.

- Type **VG** to open the **Visibility/Graphics Overrides** dialog box.
- In the **Visibility/Graphics Overrides** dialog box, go to the **Model Categories** tab. Scroll down and select the row labeled **Walls**. In the column labeled **Cut Patterns**, select the **Override** button.

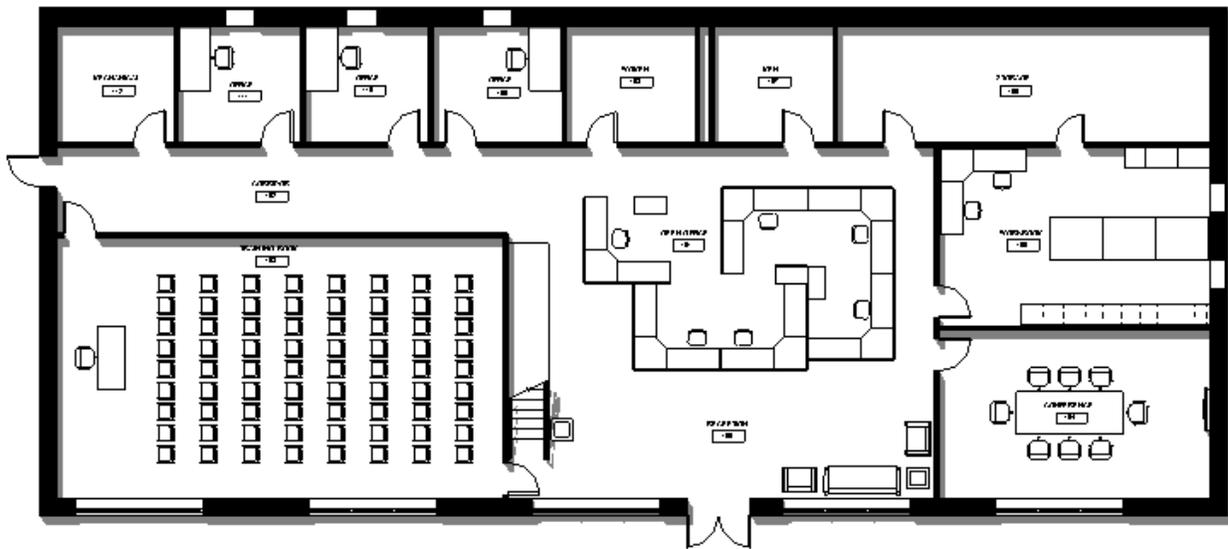
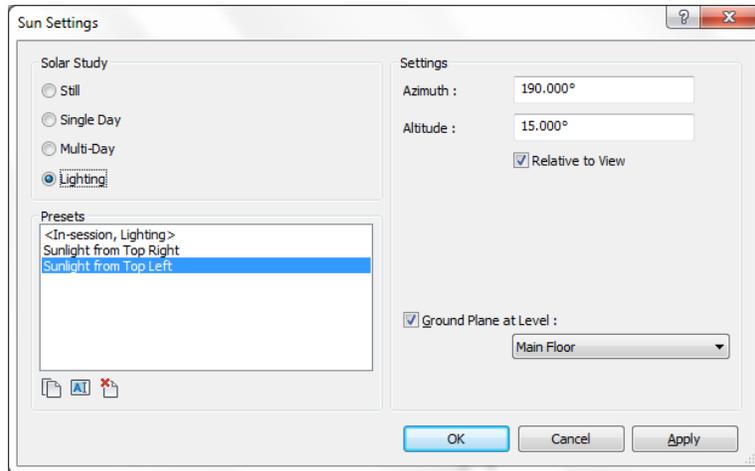


- In the **Fill Pattern Graphics** dialog box, pick the arrow to the right of the **Pattern** option, then select the **Solid Fill** pattern. Pick the **OK** buttons to exit the dialog boxes.



Show Shadows on Plan View

Turning on Shadows is another way to highlight the plan view. This can create distracting information, so finding a good balance in the shadowing is important and subjective. I like the following settings to add a little interest on the plan without overpowering the information.



Showing Floor Plans as 3D Views

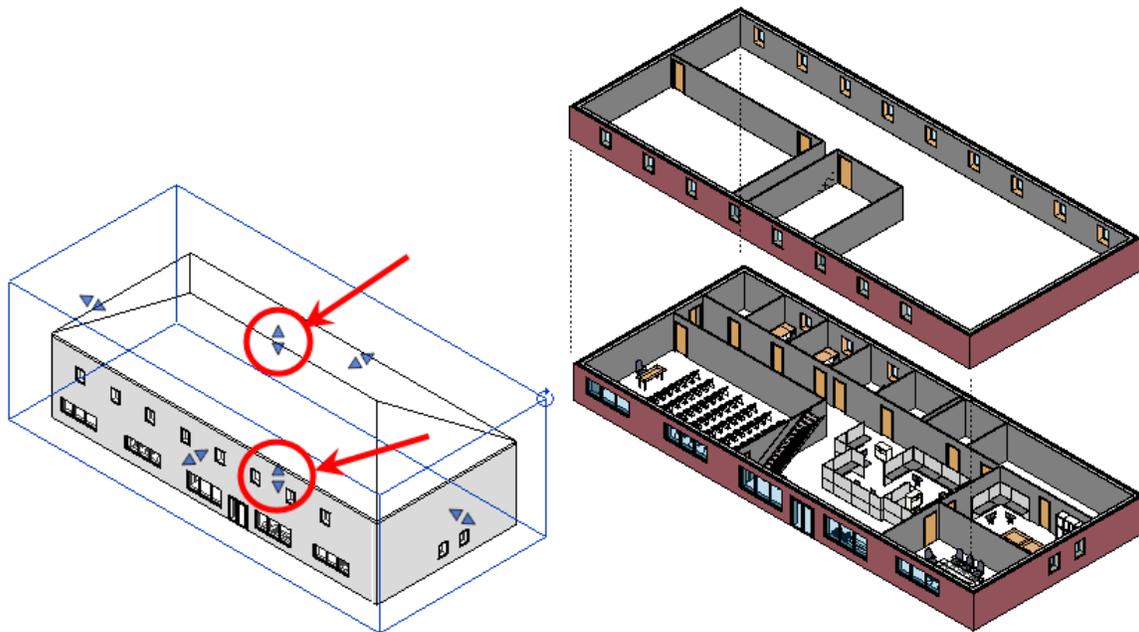
Since many people cannot understand flat floor plan views, it can be helpful to show each floor as a 3D view of that specific floor plan. The following are a couple of ways to accomplish this:

Option 1

- Duplicate the default 3D view and rename the view specific to the floor plan. For example, name the main floor plan as **Main Floor 3D View**.
- Go into the **Main Floor 3D View**, right-click over the ViewCube and select **Orient to a View -> Floor Plans**, then choose the desired main floor plan that shows information that you desire.
- Rotate the 3D view to a desirable angle.
- Highlight the section box that appears around the building and select the arrow grips at the top of the section box. Adjust the arrows down so that the top of the section box goes through the building below the second floor.

Option 2

- Duplicate the default 3D view and rename the view specific to the floor plan. For example, name the main floor plan as **Main Floor 3D View**.
- Go into the **Main Floor 3D View** and turn on the **Section Box** parameter in the **Extents** section of the view's **Properties** palette.
- Highlight the section box that appears around the building and select the arrow grips at the top of the section box. Adjust the arrows down so that the top of the section box goes through the building below the second floor.
- Adjust the arrows at the bottom of the section box so that the section box bottom is just below the main floor.



After using one of the above options, repeat the above steps to create a 3D view of each of the floor levels. This allows the client to see each floor plan with height relationships of information within the floor plan.

After creating each of the separate floor plan 3D views, those can be placed on a sheet in a stacked format so that the client can get a perspective on how each floor looks in relation to each other.

Additional Information:

- Usage of **View Templates** is very important in setting up views with desirable settings and easily retrieving those settings.
- The **Linework** tool can also be used to highlight information in various ways.

Thank you for your interest in this class!