

Tips, Tricks, and Tools

Preparing your Revit project template

1. Benefits of developing a list of managed assets organized by Revit Family categories

- Once you understand your project scope of work, start developing a list of products and equipment you expect to be used and organize that information based on Revit Family Categories in a spreadsheet.
- Organizing assets by Revit Family Category first will help making the process of assigning attributes more efficient.

2. Creating your custom TN shared parameters file

- To make the process of assigning attributes to objects once in Revit, it is recommended that the Parameter group option be utilized to create groups for each object. For example, if your project includes chillers, make a parameter group called CHILLER and place all attributes specific to chillers within that group.
- If there are attributes common to multiple objects and categories, create a group called COMMON and place those attributes there.
- After creating the shared parameter file, make sure it is loaded in your project. This is important since the family content will be referencing this file.

3. Options for Adding Parameters to objects

- Add shared parameters at the project level
 - **Pros:**
 - Quickly associate parameters with entire categories of objects.
 - **Cons:**
 - Unnecessary attributes will be added to objects that don't require them because Revit Family Categories are broad.
 - Attributes cannot be used in calculated values.
- Add shared parameters to individual families – **This is recommended.**
 - **Pros:**
 - Only the applicable attributes will be added to each object.
 - Parameters can be used in formulas for calculated values.
 - Can use the subscription only plugin named “shared parameter converter” to quickly add applicable attributes to multiple family objects at once.

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Using the Revit COBie Extension Exporter Tool

1. **KFA has prepared a series of workflow diagrams to assist teams in understanding how to use the Revit COBie exporter tool.** Refer to those diagrams for details.

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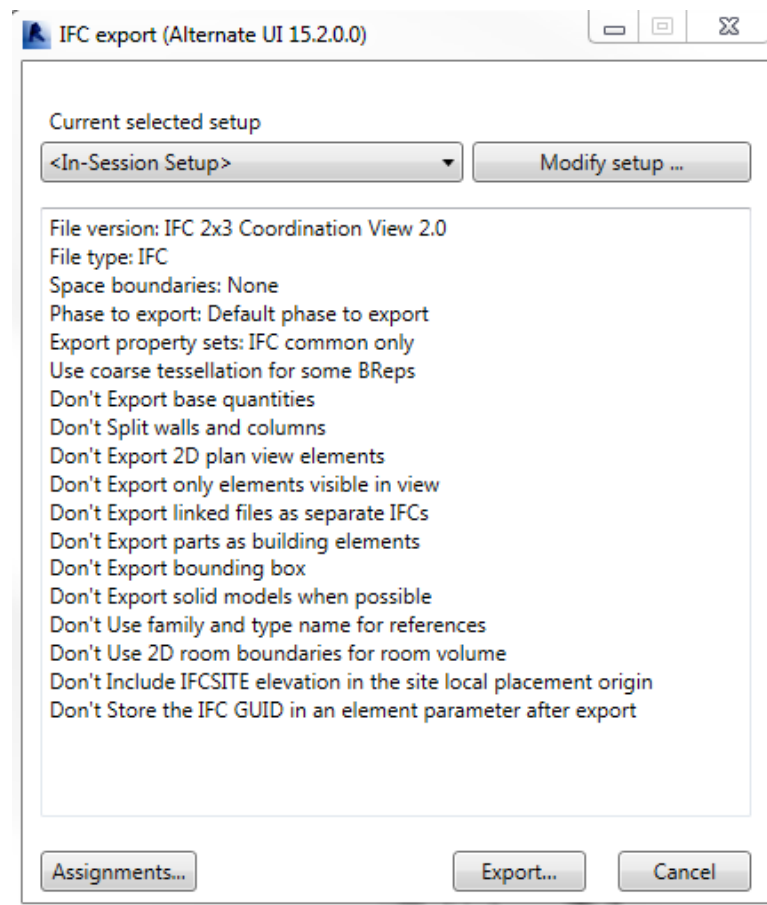
Revit OmniClass Classification for Products and Equipment

- 1. Replacing the OOTB OmniClass Table 23 Taxonomy file with a file containing the latest OmniClass Table 23 numbers and titles.**
 - As of the 2014 release, Autodesk Revit software is still being shipped with the old 2006 Release date OmniClass Table 23 Numbers and Titles associated with their Out of The Box (OOTB) family objects. In order to update this information with the latest OmniClass numbers, the text file, *OmniClassTaxonomy.txt* needs to be updated and/or replaced with a new version. To get the latest OmniClass Table 23 Numbers and Titles, visit: <http://www.omniclass.org/>.
 - It is best to open the text file in excel to perform the updates then save as a text file again when the updates have been completed complete.
 - If using Windows XP, the file is located in the following folder:
Revit Architecture 2012 and older:
C:\Program Files\Autodesk**Revit Architecture 2013 and newer:**
C:\Documents and Settings\ - If using Windows 7 or higher, the OmniClass Taxonomy file is located in the following folder:
Revit Architecture 2013 and newer:
C:\Users\ - Once the text file is updated, the user will need to open/edit all objects in their component library individually to make sure the classification is selected. Unfortunately, the objects will not automatically update simply because a new file has been placed in the folder.
- 2. Using the Classification Manager (Included with the 2013 Revit COBie Toolkit Only) tool**
 - This tool provides a “work around” to actually replacing the outdated OmniClassTaxonomy file. While it allows you to apply Omniclass Titles and Numbers to objects in bulk as opposed to individually, the updated title and number does not replace the numbers associated with the default attribute for this classification; it creates a separate attribute and places this information there.
 - If this method is used, the user will need to remember to select the appropriate OmniClass Title and Number for export to COBie since there will be two of each in the model.

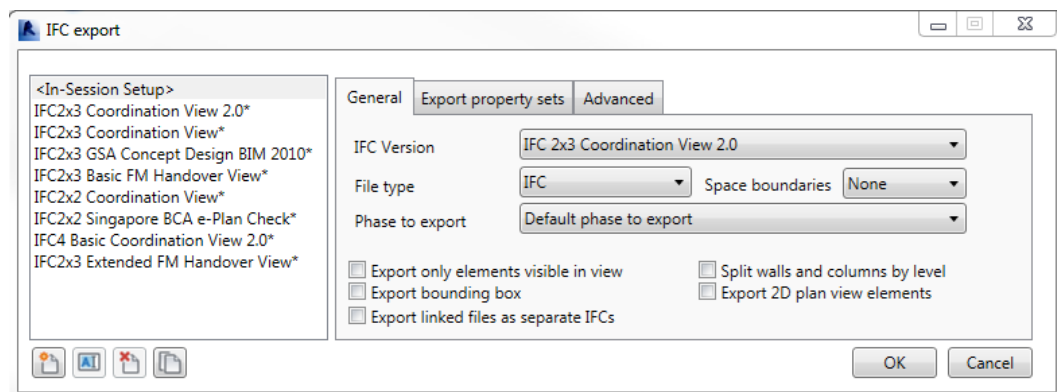
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Tips for Exporting to IFC from Revit

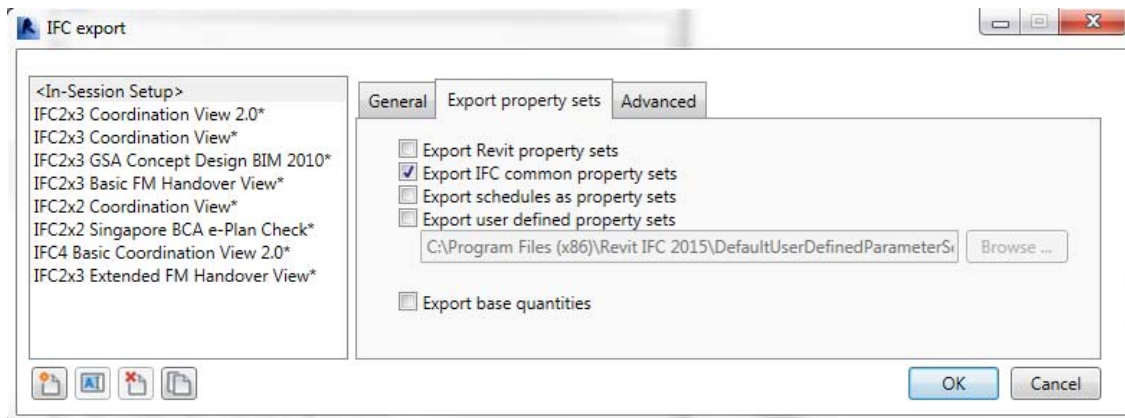
1. **Download and install the open source Revit IFC exporter (both the UI and exporter) for your release version of Revit from SourceForge.net.** (<http://sourceforge.net/projects/ifcexporter/>) The tool can also be downloaded from the Autodesk Exchange site as well. Unlike the Out of the Box (OOTB) exporter, this version allows the user to adjust several settings to improve the export output. Users have more control and can confirm exactly what gets exported to IFC. See the screen shots below for the IFC Exporter dialog & setup windows using the latest version of the IFC Exporter tool for Revit.



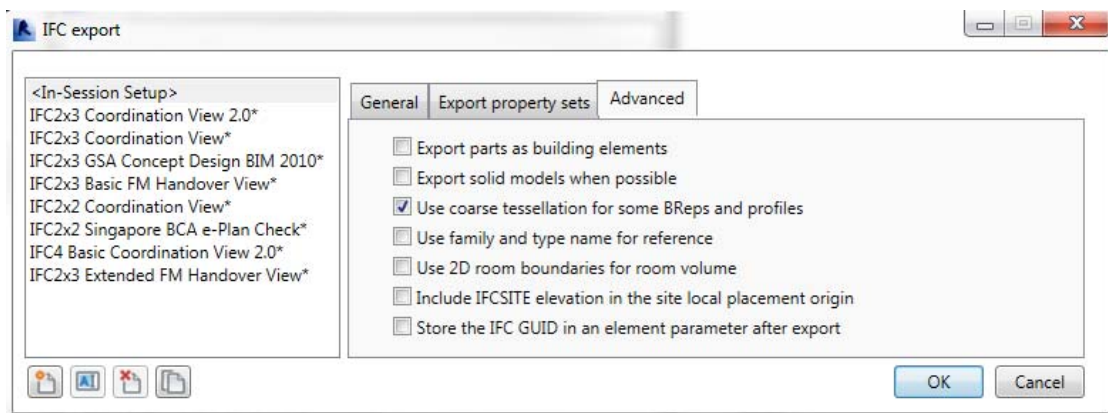
Revit IFC Exporter Dialog Window



Revit IFC Exporter Settings Dialog – General Tab




Revit IFC Exporter Settings Dialog – Export property sets Tab



Revit IFC Exporter Settings Dialog – Advanced Tab

2. To create custom IFC export settings, do the following:

Click the  icon. Next, confirm the following:

- IFC Version: IFC 2x3 Coordination View
- File Type: IFC or Zipped IFC
- Space Boundaries: 2nd Level
- Phase to Export: Should reflect the Phase of the project you wish to export

Next, check the following boxes:

General Tab:

- Split walls and columns by level
- Export 2D plan view elements

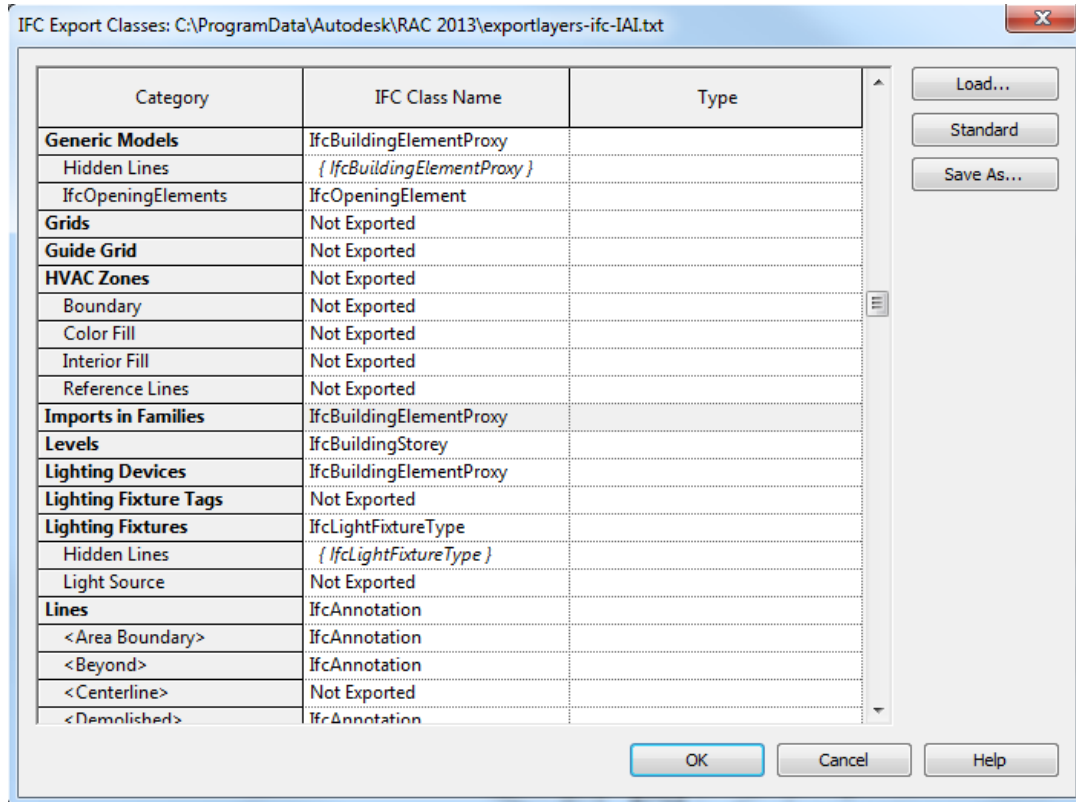
Export Property Sets Tab:

- Export Revit property sets
- Export IFC Common property sets

Advanced Tab:

- Include IFCSITE elevation in the site local placement origin
- Use coarse tessellation for some BReps

3. These settings have been tested numerous times and have resulted in IFC models being exported from Revit that contain the additional attributes added to objects.
4. **If necessary, modify the IFC Export Classes text file via the Revit → Export→Options→IFC Options dialog to change what items get exported to IFC.** Below is a screenshot of the dialog box.



IFC Export Classes Dialog Window

5. **Once the IFC files have been exported**, they can be opened and viewed in any number of free IFC model viewing tools such as Tekla BIMsight or Solibri Model Viewer.
6. **Additional information regarding the tool can be found on the Revit IFC Exporter Wiki page.**
<http://sourceforge.net/p/ifcexporter/wiki/Home/>

Note: The latest version of the Revit IFC Exporter for Revit 2014 allows for exporting to model to the IFC release 4 (IFC4) format, which is the most current official IFC version. When using Revit 2014 products, be sure *not* to choose this option since support for this schema is not available in many IFC viewing software platforms yet. (As of 04.01.2014)

Pre-configured IFC Settings File

To load and use a preconfigured IFC settings file, take the following steps:

1. Navigate to Export, then scroll down to Options and choose IFC Options
2. Click the Load button, then navigate to the IFC setting text file.
3. Click the appropriate text file, and then click Open.

Creates exchange files and sets options.

- Family Types**
Exports family types from the current family to a text (.txt) file.
- NWC**
Saves the scene as a Navisworks NWC file.
- gbXML**
Saves the project as a gbXML file.
- Mass Model gbXML**
Saves the conceptual energy model as a gbXML file.
- IFC**
Saves an IFC file.
- ODBC Database**
Saves model data to an ODBC database.
- Images and Animations**
Saves animations or image files.
- Reports**
Saves a schedule or Room/Area report.
- Options**
Sets export options for CAD and IFC.

Options Exit Revit

Options Dialog window

IFC Export Classes: H:\TN OSA\18 Tips Tricks & Tools\exportlayers-ifc-TNOSA_BIMr.bt

Category	IFC Class Name	Type
Text Notes	IfcAnnotation	
Title Blocks	Not Exported	
Medium Lines	Not Exported	
Thin Lines	Not Exported	
Wide Lines	Not Exported	
Topography	IfcBuildingElementProxy	
Boundary Point	IfcBuildingElementProxy	
Hidden Lines	{ IfcBuildingElementProxy }	
Interior Point	IfcBuildingElementProxy	
Primary Contours	IfcBuildingElementProxy	
Secondary Contours	IfcBuildingElementProxy	
Triangulation Edges	IfcBuildingElementProxy	
View Titles	Not Exported	
Wall Tags	Not Exported	
Walls	IfcWall	
Common Edges	{ IfcWall }	
Curtain Wall Grids	IfcWall	
Cut Pattern	{ IfcWall }	
Finish 1 [4]	{ IfcWall }	
Finish 2 [5]	{ IfcWall }	
Hidden Lines	{ IfcWall }	
Membrane Layer	{ IfcWall }	

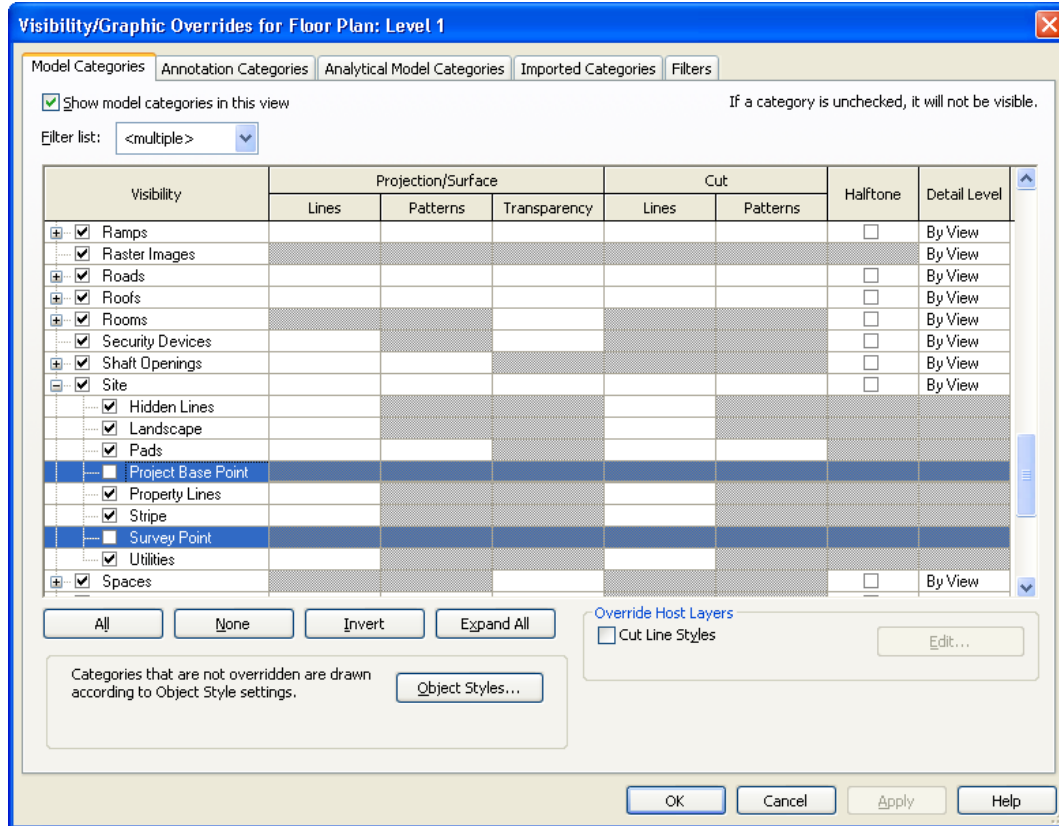
Load... Standard Save As... OK Cancel Help

IFC Export Settings Dialog window

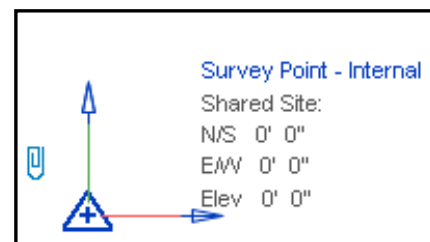
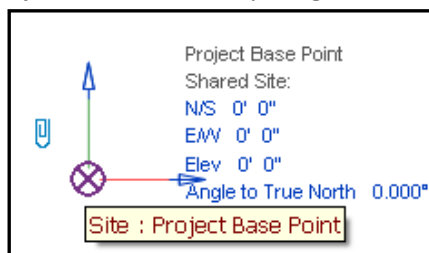
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Geo-referencing in Revit

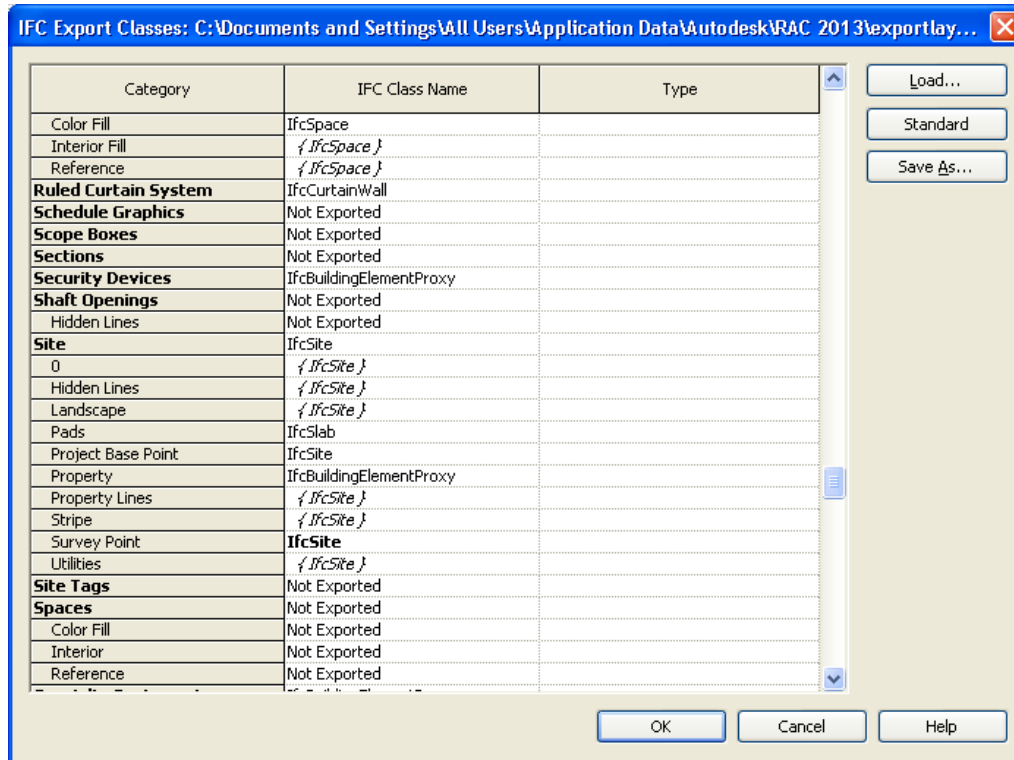
1. **Make sure the Project Base Point and the Survey Point are visible.** These settings can be adjusted from the Visibility/Graphic Overrides menu.



2. Once both are visible, the Project Base point is the Circular object, and the Survey Point is the Triangular object.
3. **Determine the location of your project based on the TN State Plan Coordinate system.** Enter values for the following:
 - a. Project Base Point and Survey Point: **N/S**
 - b. Project Base Point and Survey Point: **E/W**
 - c. Project Base Point and Survey Point: **Elev**
 - d. Project Base Point Only: **Angle to True North**



4. **Change the IFC Export Options to allow Project Base Point and Survey Point information to be exported.**
Change “Not Exported” to “IfcSite” for both.



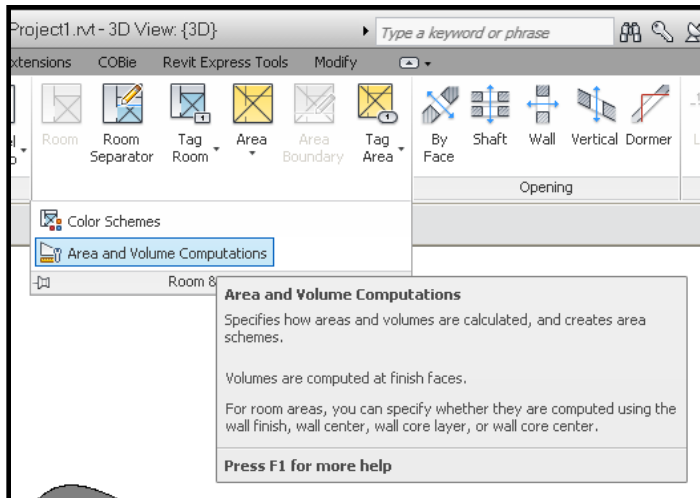
Note: The objects are only visible in Revit; they are not visible in the exported IFC model; however, the data is accessible in the IFC file. When the IFC file is opened in Tekla BIMsight,

- N/S = Origin.X
 - E/W = Origin.Y
 - Elev = Origin.Z
5. In order to have a 3D object represent the coordinates of the project, create a custom generic model family object in Revit and add the following attributes:
- GeoRef_AngleToTrueNorth
 - GeoRef_NS
 - GeoRef_EW
 - GeoRef_Elev
6. Locate the object in the same place as the Project Base Point Object in Revit and add the same values entered for the Project Base Point and Survey point.
7. When the file is exported to IFC, the object will be visible and the attributes/values can be viewed as well by selecting the object and viewing its properties.

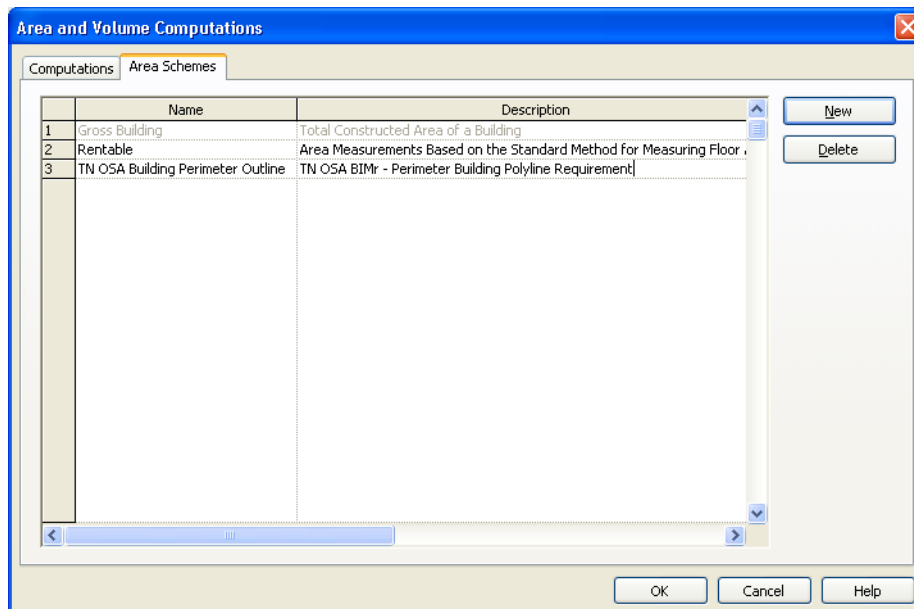
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Steps for creating a building polyline in Revit that can be viewed in both a 2D DWG file and a 3D IFC model file

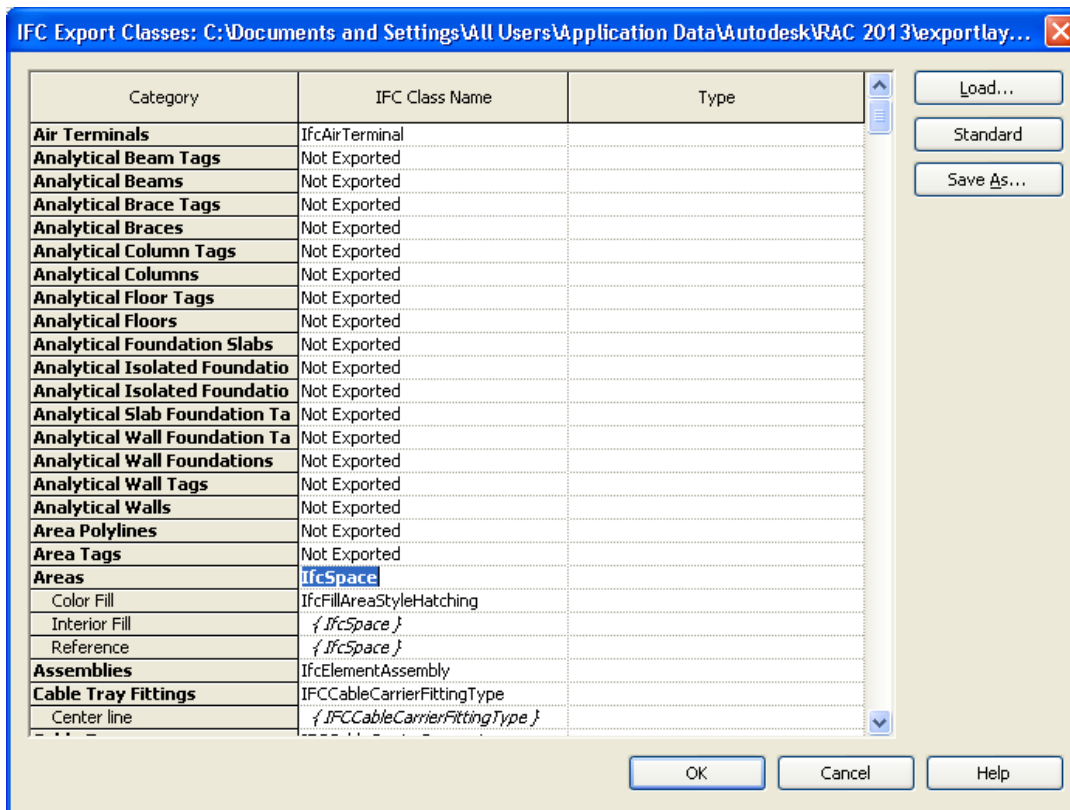
1. **Create an area plan.** If area plans are used for other purposes on your projects, it is best to create an “Area Scheme” for this requirement. The area scheme could be named “TN OSA Building Perimeter Outline”.
2. To create an area scheme, highlight the Architecture tab in Revit, then expand the Room & Areas drop down box, and then select Area and Volume Computations.



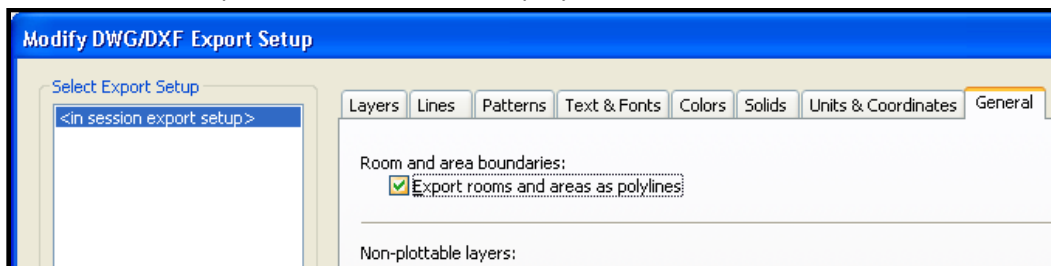
3. Press the Area Schemes tab, then press “New” to create new scheme.



4. Create new area plan of the lowest level using newly created scheme.
5. Use **Area Boundary Lines** to trace the perimeter of the building.
6. Place an **Area** object within the boundary.
7. **Tag** the Area to name it.
8. **Update IFC Export Settings in Revit so that Areas get exported to IFC.** Change the IFC Class Name from “Not Exported” to “IfcSpace”.



- Update DWG Export Settings so that Room and area boundaries get exported as Polylines. From the General tab, check the “Export Rooms and areas as polylines” box.



- Export the model or view
 - To IFC format
 - To DWG format
- When the IFC model is opened in an IFC viewer, the perimeter outline will show up as a space. When the DWG file is opened in a CAD software program, the perimeter outline will show up as a polylines.

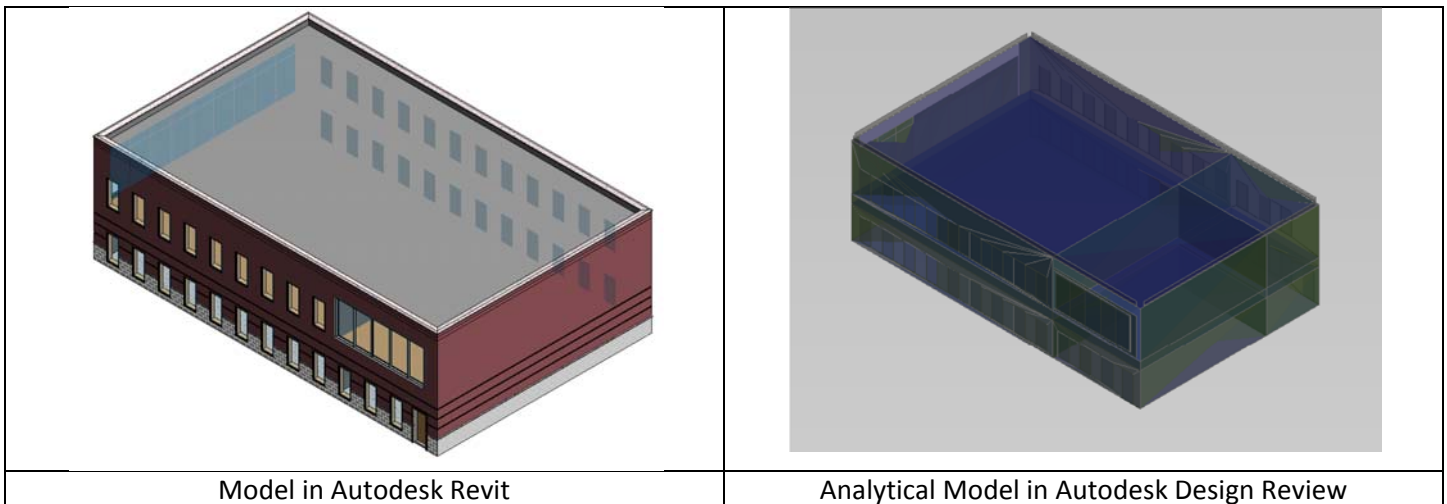
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Creating an Energy Model in Revit 2014

The latest version of Revit now allows users to perform energy analysis within Revit directly on actual BIMs in addition to massing BIMs. However, it is still important that the model be constructed with minimal detail.

In previous Revit releases, detailed energy analysis on the BIM could only be accomplished by exporting the model to GBXML format and analyzing in Green Building Studio. Early energy analysis within Revit could only be accomplished by performing the analysis on a simple massing model. This type of workflow required users to create a mass model first, then after completing the energy analysis, create a BIM from the mass by using facing of the mass as a reference. This workflow was sufficient, however not all building forms require a mass model to explore the form and the mass was simply generated for the purpose of performing the energy analysis. For example, a simple rectangular building does not require the designer to start with a mass to analyze the form.

When the energy analysis is run on the BIM, users can view the automatically created analytical model by opening it in Autodesk Design Review. This allows for spot checking the model for major gaps or voids.



To view the analytical model, do the following:

1. From within Revit, make sure the **Analyze** tab is highlighted then click the **Results & Compare** icon located in the Energy Analysis section of the window.
2. Select the analyzed model you wish to view from the selection tree on the left hand side of the dialog window.
3. Next click the **Open** icon at the top of the menu bar in the Results and Compare dialog window. Choose **Design Review** from the drop down menu.
4. The analytical model will open in design review. Explore the model using the navigation tools. Use the selection arrow tool to select objects and review information related to their analytical properties.

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Using Tekla BIMsight

- 1. The latest version allows for sharing models amongst project teams over a network or cloud collaboration site, however some information placed in the model will not be allowed with using the sharing method as opposed to distributing the .TBP file.**
 - Items available in a shared model file:
 - Models
 - Notes
 - Items **NOT** available in a shared model file:
 - Saved Views
 - Conflict Rules
 - Documents
- 2. Assigning colors in Tekla BIMsight**
 - When changing the default colors of models, individual objects, systems, etc., understand that the colors will revert back to the default color when updated versions of a particular model are reloaded in Tekla BIMsight.
- 3. Tekla BIMsight now has support for 2D grids**

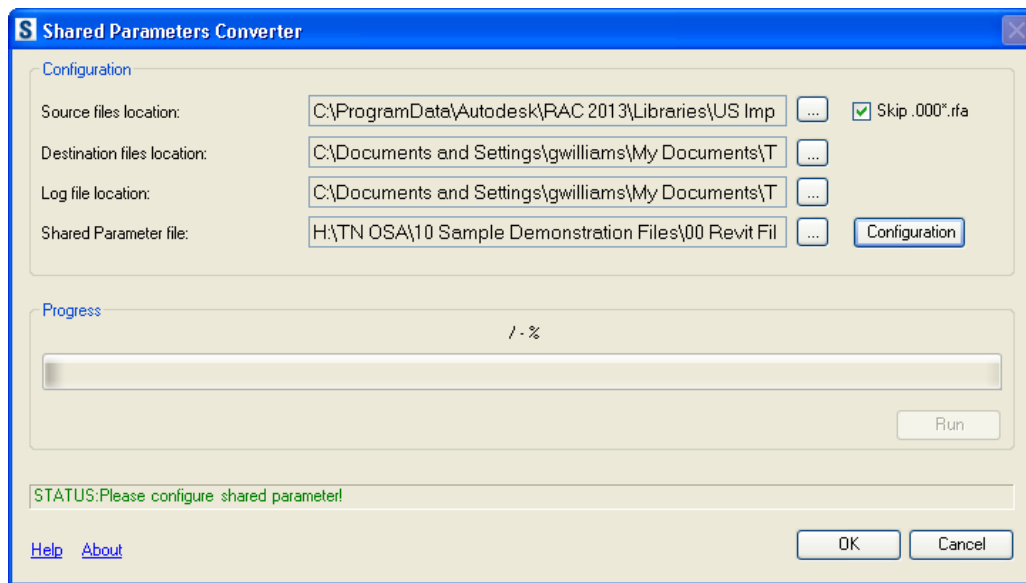
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Using the Autodesk Revit Extension “Shared Parameters Converter”

1. **The Shared Parameters Converter** is a tool that provides a convenient way to update Out Of the Box Revit families with attributes contained in a shared parameters file.
2. Currently it is only offered as an extension available only to subscription customers.

Steps:

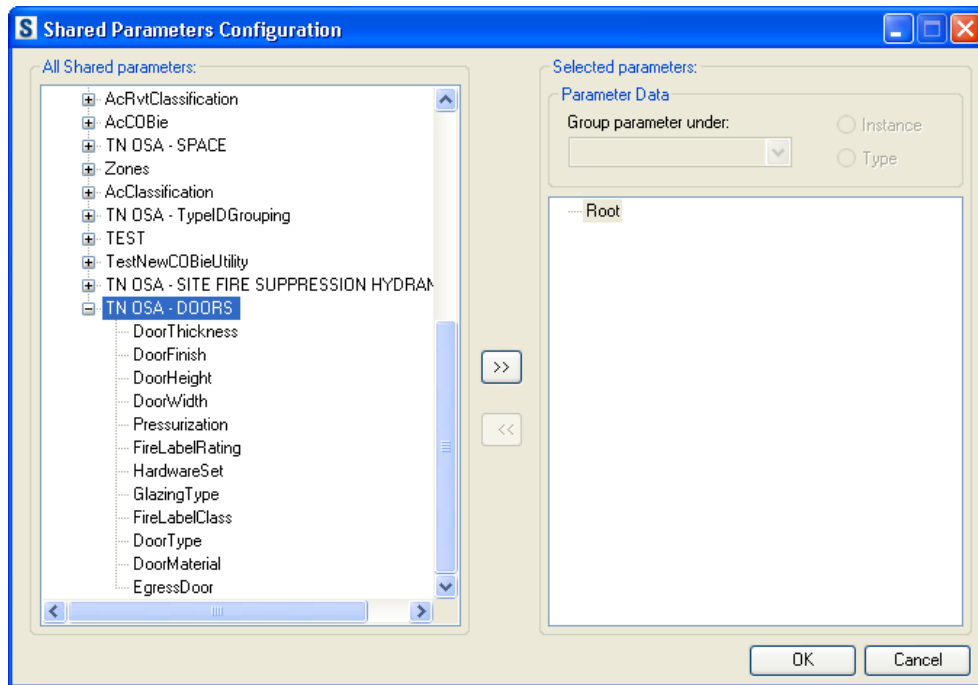
1. **Choose the source files location.** This is the folder where the revit family objects are currently located. Be sure to uncheck the box next to “Skip.000*.rfa”. **Tip: Choose one group of family objects at a time. e.g. Doors, Windows, etc.**



2. **Choose the destination files location.** The extension tool does not overwrite the original family elements, it simply makes a copy of them and applies the shared parameters to the copies and places them in your selected folder.
3. **Set the Log file location.** If there are any issues with the conversion, this file will document the error.

(See next page)

4. **Choose the Shared parameter file.** This is your file that contains the parameter you want applied to the objects.
Note: It is important that the shared parameters be created with the correct “Type of Parameter” assigned e.g. text, integer, number, etc. This ensures that values will have the correct unit associated with them.
- a. **After choosing the shared parameter file, press the Configuration button.** From this dialog window, choose the parameters you wish to have added to the objects in the folder you selected by highlighting either the group or individual parameters within a group and pressing the arrow in the center between the **All Shared Parameters** category and the **Selected Parameters** category. In addition, you can also choose how each parameter should be applied, either as an **Instance** or **Type**. NOTE: This can only be changed individually for each parameter. Users cannot change this globally for a group.



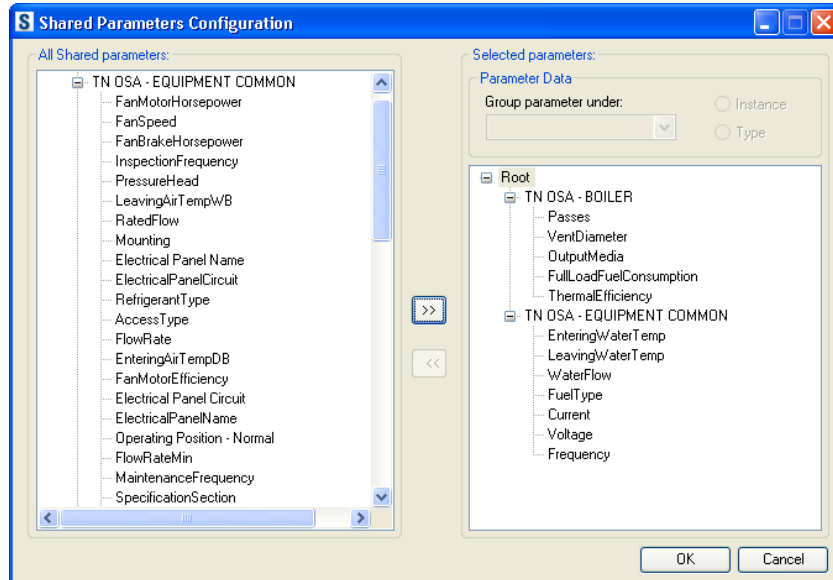
5. **Once finished press OK.** The extension will now perform the conversion.

Benefits:

1. Saves time adding attributes to groups of objects since an entire folder can be selected.
2. Allows user to select a specific folder to apply attributes. Unlike adding shared parameters at the project level in Revit, the user has control over which attributes get associated with what elements instead of attributes being applied at the family category level.

Known Issues:

1. If the shared parameter file contains an attribute already associated with the existing object, e.g. voltage, the converter will produce an error and will not complete the shared parameter update. If this occurs, modify your shared parameter file by removing parameters that already exist with family objects. This requires either reviewing the family objects ahead of time or reviewing the log error report generated by the extension tool.



Tips, Tricks, and Tools

Adding Attributes to Model Objects in ArchiCAD

1. **The IFC structure is fully integrated into ArchiCAD so adding custom IFC attributes to objects in a model is native to this application.**
 - To create/edit/select IFC property sets, navigate to