



GEN22163

Access Free Web-Based Mapping Data

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Learning Objectives

- Locate free web-based map resources (web feature service and web map service)
- Learn how to create connections to web-based maps in AutoCAD Map and AutoCAD Civil 3D
- Learn how to add web-based map information as a data source in InfraWorks 360
- Learn how to configure web-based map data sources in InfraWorks 360

Description

Do you need to access additional map data for your projects? Come to this presentation and learn how to locate, use, and configure web-based map services in AutoCAD Map software, AutoCAD Civil 3D software, and InfraWorks 360 software! This session features AutoCAD Map 3D and InfraWorks 360.

Your AU Expert(s)

KaDe is a technical specialist for U.S. CAD, and provides training, network licensing services, technical support, and migration services. She has been using AutoCAD® since 1987 and has been a professional trainer since 1993. KaDe is an AutoCAD Certified Professional and an Autodesk Certified Instructor. She has been the recipient of the Autodesk Instructor Quality Award twice, and is a frequent presenter at Autodesk University. Her experience is widely varied and includes real-world application of AutoCAD in the AEC, mapping, civil, and manufacturing industries. She enjoys teaching, and her specialty is relating to the class participants and helping them to get the most out of the training course, whatever it may be.

James describes himself as 110% nerd at heart: I love any new technology, software or futurist view I can get my hands on. I love learning about new features or figuring out how to use something and I especially like it when I find a use for something that it wasn't originally intended for! Finding new workflows to increase efficiency is always my goal in whatever I do. Why do something the hard way or waste time just because that is the way we have always done it? I love traveling, meeting new people and just listening to their stories, issues or concerns, it really doesn't matter if it is personal or some big technical issue. The joy comes from trying to figure out a solution to that issue, or just letting someone let it out. Being helpful in anyway is a truly rewarding experience. As a presenter, teacher, instructor and mentor I am always trying to find better and more entertaining ways to communicate with people. We all learn and process information differently so I try to adapt on the fly if I can tell someone is just not getting it. If you can make it fun then you are more likely to remember something. Sometimes content isn't really all that exciting, so it is fun to put a spin on it, like when I was tasked to create an instructional video about using a plotter. I threw in a little Star Wars to spice it up <https://www.youtube.com/watch?v=VumIGDDYwzc>



Let's first talk about WMS and WFS. What is WMS? What is WFS?

WMS – A Web Map Service (WMS) is a standard protocol for serving georeferenced map images over the Internet. A map server generates these using data from a GIS database.

https://en.wikipedia.org/wiki/Web_Map_Service

WFS – A Web Feature Service (WFS) is an interface standard that provides an interface allowing requests for geographical features across the web using platform-independent calls. WFS contain geographical features and data, whereas the WMS returns only an image.

https://en.wikipedia.org/wiki/Web_Feature_Service

Since WMS and WFS were developed by the Open Geospatial Consortium they are industry standards that are accessible through many software engines, including AutoCAD Map 3D/AutoCAD Civil 3D and InfraWorks. Our goal today is to show you where you can find WMS and WFS data, how to use and configure it in AutoCAD Map 3D/AutoCAD Civil 3D and how to use and configure it in InfraWorks!

Locate Free Web-Based Map Resources (WMS and WFS)

So where can we find WMS and WFS servers? This is a good question but this question has way too many answers. There are numerous sources for this type of data on the Internet! In fact, so many that it is overwhelming. We'll start with a good post that I found on the Open Geospatial Consortium - <http://www.opengeospatial.org/blog/2034>. I recommend that you go and read the full post!

This posts lists the following resources (plus a few others):

- <https://www.data.gov/> - Data.gov is an easy to use site with an excellent search engine
- <http://gptogc.esri.com/geoportal/catalog/search/search.page> - Esri's Geoportal search engine
- http://www.geoportal.org/web/guest/geo_home_stp - GEOSS Portal
- http://www.skylab-mobilesystems.com/en/wms_serverlist.html - Skylab OGC WMS Server List

Each of these resources are a hub for identifying services and there are thousands of services listed on each site. So this should give you a good jumping off point!

Tips for using WFS and WMS Services

- Check the URL carefully – there are often small errors that paste in with a URL, like extra spaces in the middle of the path. Paste the URL into notepad and examine it for errors.
- Check to make sure the Data Connection dialog box is expanded to show all information.
- In AutoCAD Map (Civil 3D) you may need to change the version for either WFS or WMS services that you are trying to connect to. So if you get an error message when trying to connect, try switching the version. I've found resources online that suggest switching to 1.0.0 for WFS or 1.1.1 for WMS.

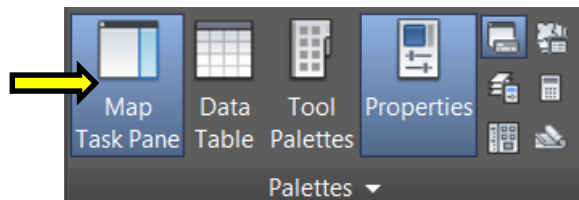


Create Connections to Web-Based Maps in AutoCAD Map or Civil 3D

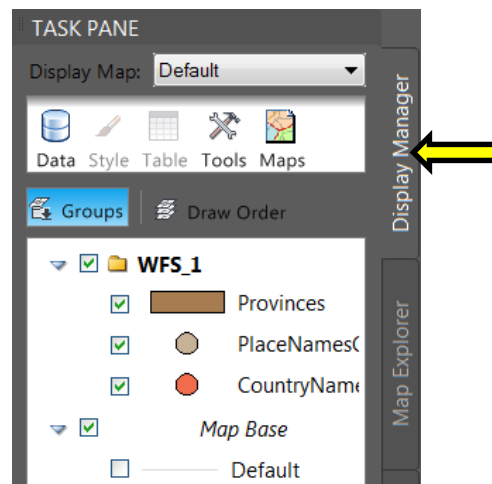
Creating connections to a web-based server is a simple process, especially if you've ever created a connection to any feature data source previously. But no worries, we'll walk you through it.

The tricky part is getting the settings correct and manipulating the dialog boxes!

1. Open the Map 3D Task Pane by going to the VIEW tab->PALETTES panel on the ribbon and then select MAP TASK PANE. You can also type MAPWSPACE at the command line and then type ON and hit enter. **If you are using Civil 3D you may want to switch to the Planning & Analysis workspace first, but this is only required if you want to use the ribbon.**



2. On the Task Pane click on the DISPLAY MANAGER tab. You will need to be in the Display Manager to fully manage any data you add to your drawing through this process.

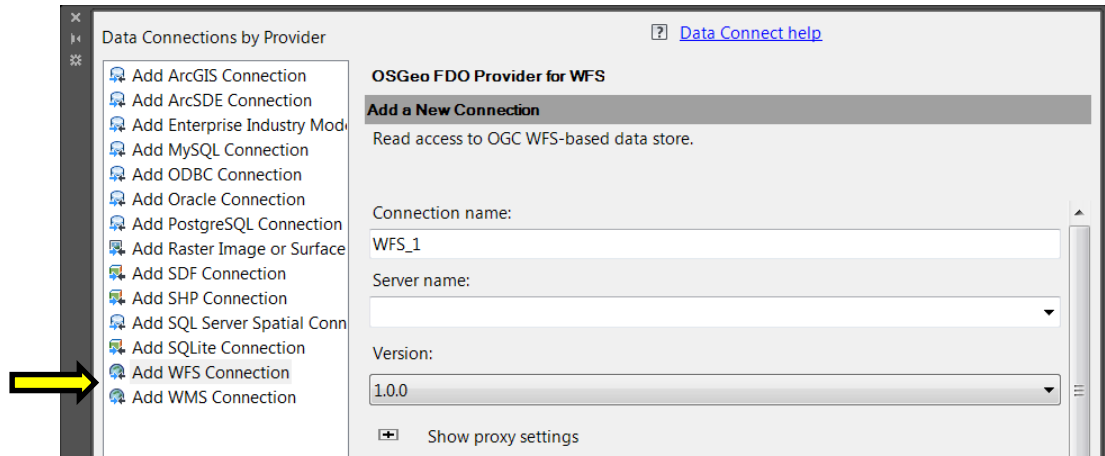


3. There are three ways to start the DATA CONNECT tool.
 - a. From the Display Manager you can click on the DATA tool, then click Connect to Data.
 - b. From the HOME tab under the DATA panel on the ribbon you can choose CONNECT.
 - c. Type MAPCONNECT and hit enter.

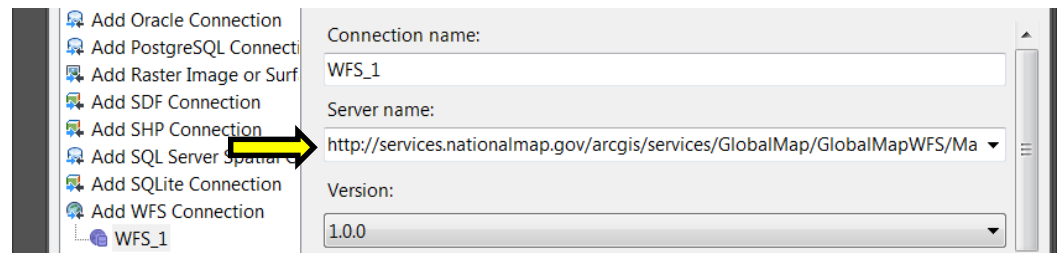




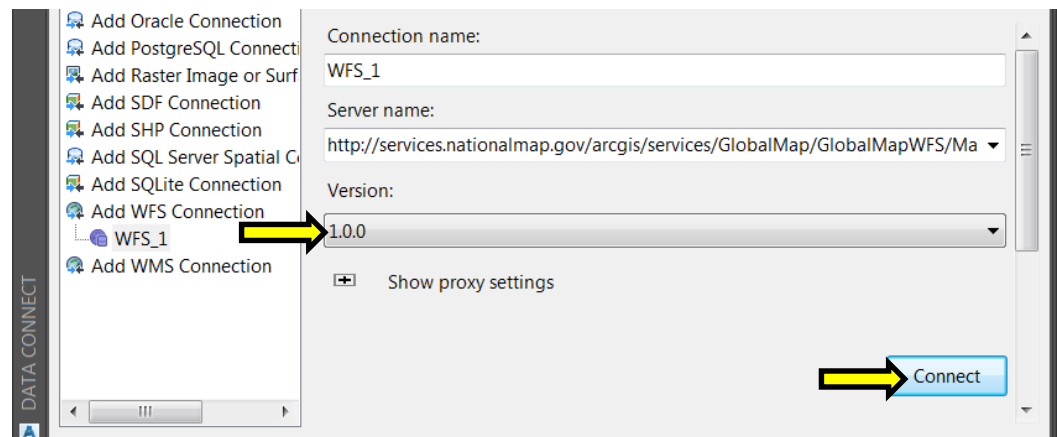
- When the data connections (map connect) dialog box opens, click on ADD WFS CONNECTION (or Add WMS Connection).



- Enter the Connection Name, basically a nickname for the connection, or leave it as the default.
- Copy and paste the URL for the map server you are trying to connect to, into the SERVER NAME box.
 - For example, this is the National Map Server -
<http://services.nationalmap.gov/arcgis/services/GlobalMap/GlobalMapWFS/MapServer/WFSServer?request=GetCapabilities&service=WFS&version=1.1.0>

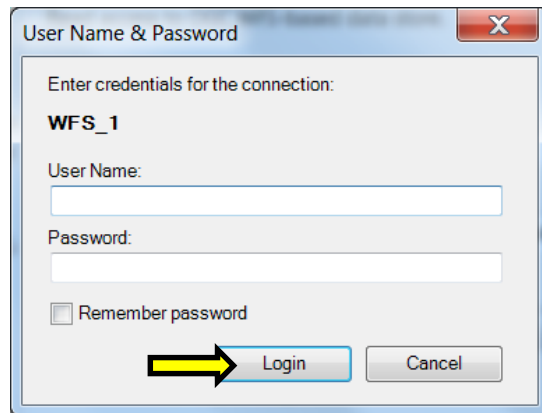


- Change the VERSION to 1.0.0 (I've found that most WFS services work consistently with this version number) then select CONNECT from the dialog box. If that doesn't work, switch the version and try reconnecting.

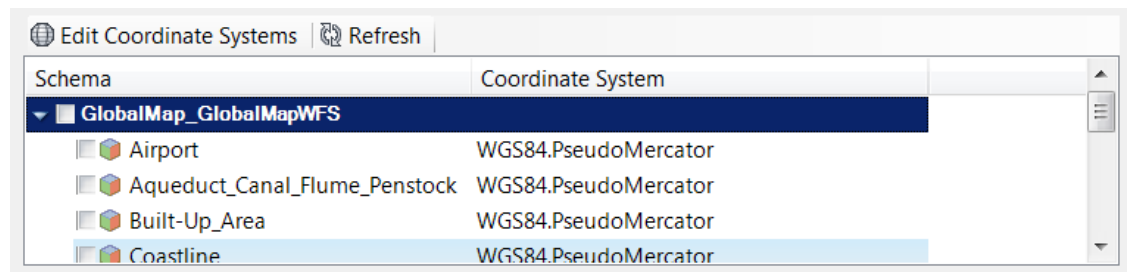




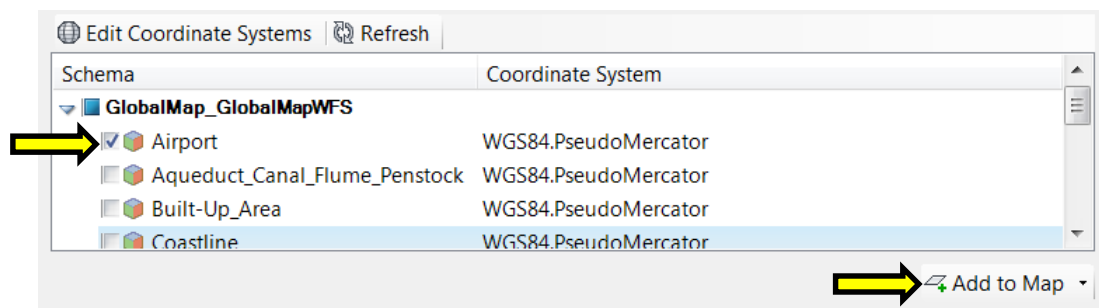
8. Ignore the prompts to enter a user name and password (unless you have been given a specific user name and password for a protected service). Click LOGIN to continue.



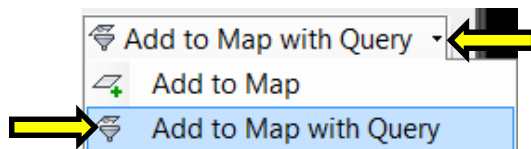
9. At this point, the list of items available on the server will show in the dialog box.



10. Place a check mark next to any items you want and then click on ADD TO MAP.

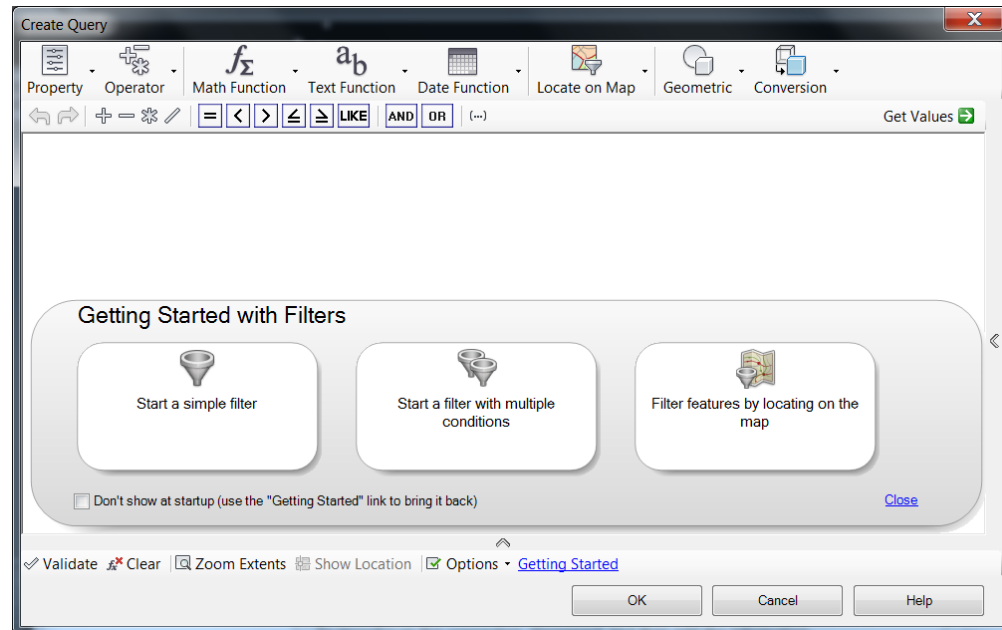


11. In some situations there may be a lot of data available and loading all of the data would take too long and will likely be more than what you need. In that situation you can click on the down arrow to the right of "Add to Map" and choose ADD TO MAP WITH QUERY as an alternative.

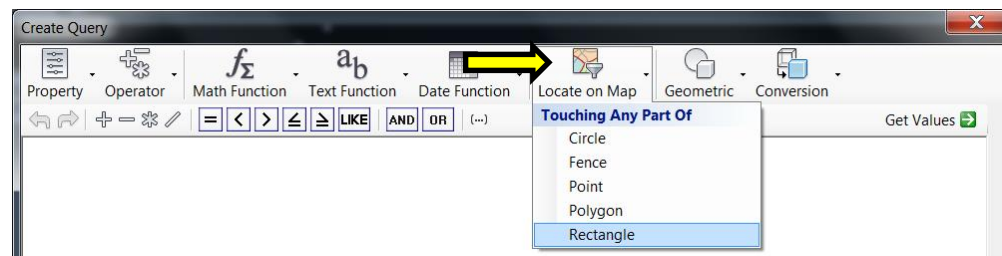




12. If you chose ADD TO MAP, your data layer will now appear in your Display Manager and on your drawing. You may need to perform a zoom extents to see everything.
13. If you chose ADD TO MAP WITH QUERY, you will see the AutoCAD Map CREATE QUERY dialog box.



14. Within this box you can create a filter that will identify specific criteria. A common option is to click on the LOCATE ON MAP tool and then use a selection window to specify a particular part of your drawing as a filter.



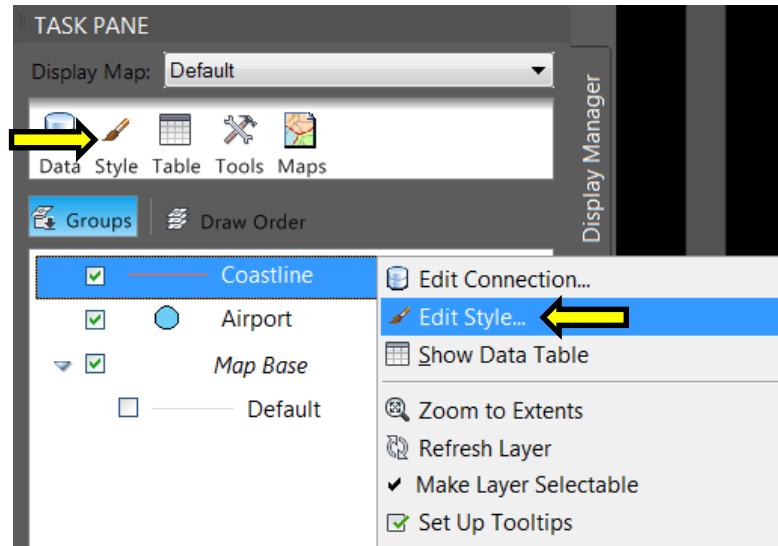
15. After creating your filter pick OK. The data will then be added to your drawing.
16. This process can be repeated for multiple elements by simply selecting the connection you created and selecting a new element to add to your drawing.



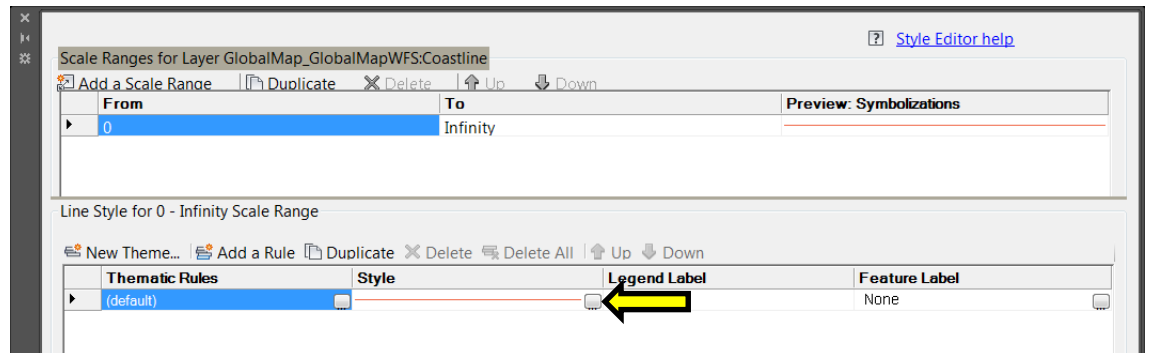
As items are added to your display manager, they are automatically given a style (color, symbol, linewidth, etc...), but you can change that style easily.

Here is the workflow to manipulate the style of your display manager layers.

1. In the Map Task Pane, go to the Display Manager tab.
2. Select the feature layer you would like to edit. Then choose STYLE from the icons at the top or you can right-click and choose EDIT STYLE.

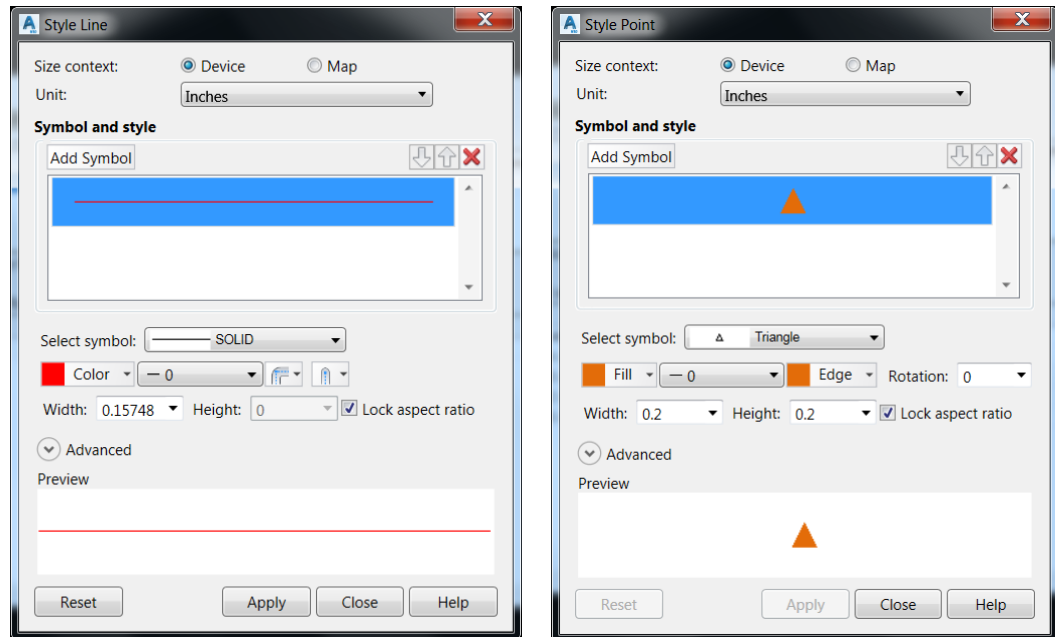


3. The Style Editor is now open and you can use it to change the look of the data. Click on the ellipses button to edit the line or point style. See the button designated by the yellow arrow below.

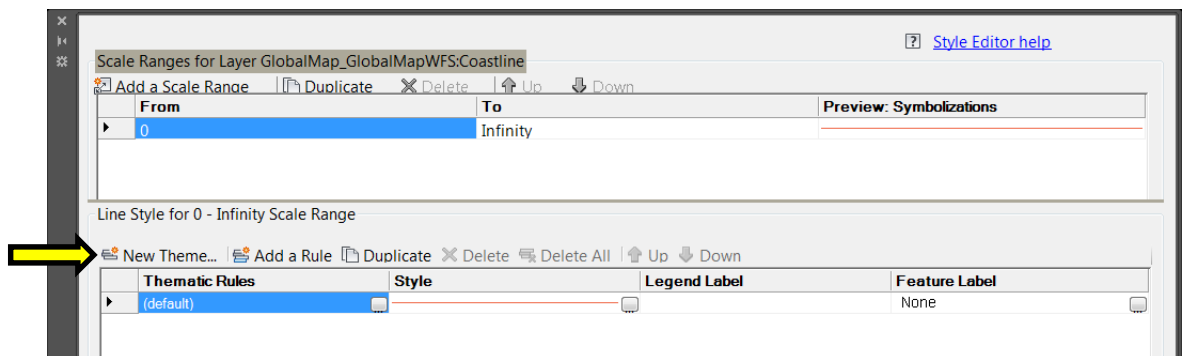




- After you click the ellipses button to edit the line or point style you will see the following dialog box(es). You can edit the symbol, color, fill color, linewidth, width, height, etc... Settings will be dependent on the type of feature layer that you selected. Make any changes you want and then pick APPLY and then CLOSE when you are ready.

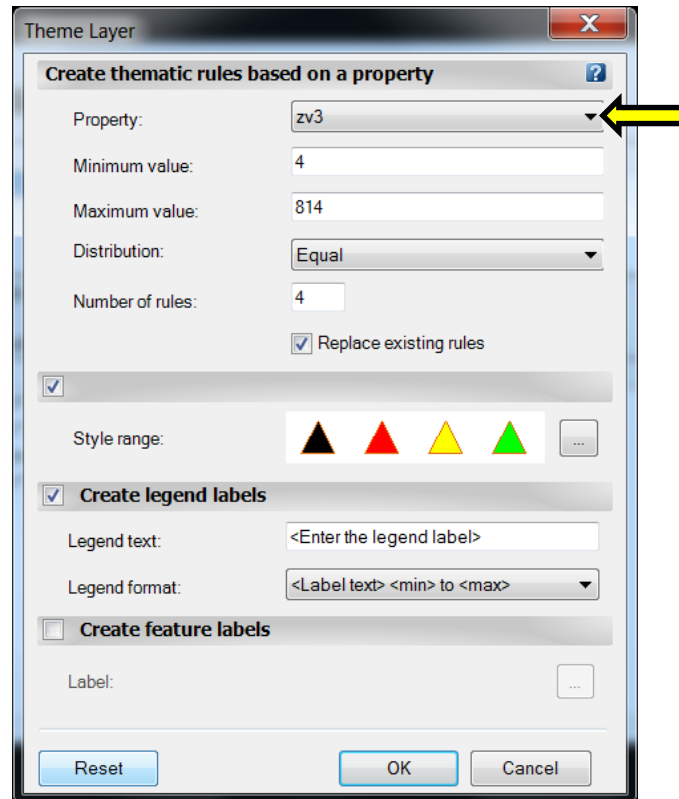


- You can also apply a theme by clicking on the NEW THEME button.

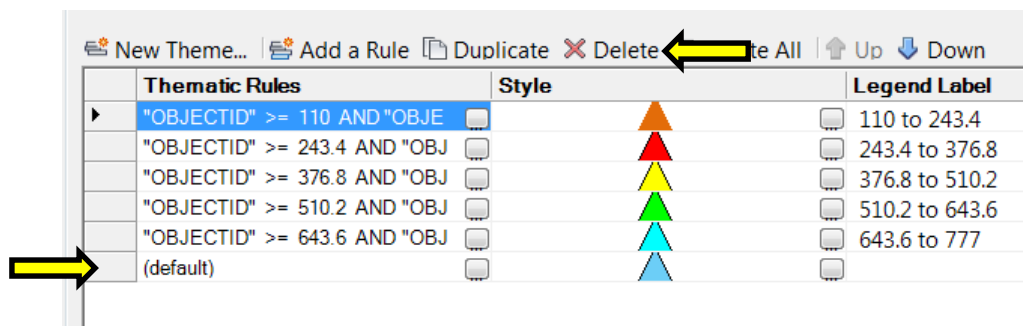







- The dialog box for creating a theme allows you to select what property (data) you'd like the theme to be based off. Once the property is selected you can set how you want the theme to distribute the values and choose a color style range. You can also setup labels for a potential legend for the theme as well as feature labels. When you're ready to run the theme just pick OK.




- When you create a theme you can end up with an extra row that you may need to remove which is generally the original default value for the line or point. To remove that row just select the square at the beginning of the row and then choose the DELETE button (red X) from the tools above.

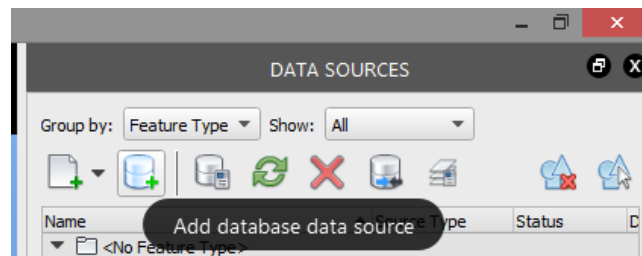


Add Web-Based Map Information as a Data Source in InfraWorks 360 and Configuring the Source

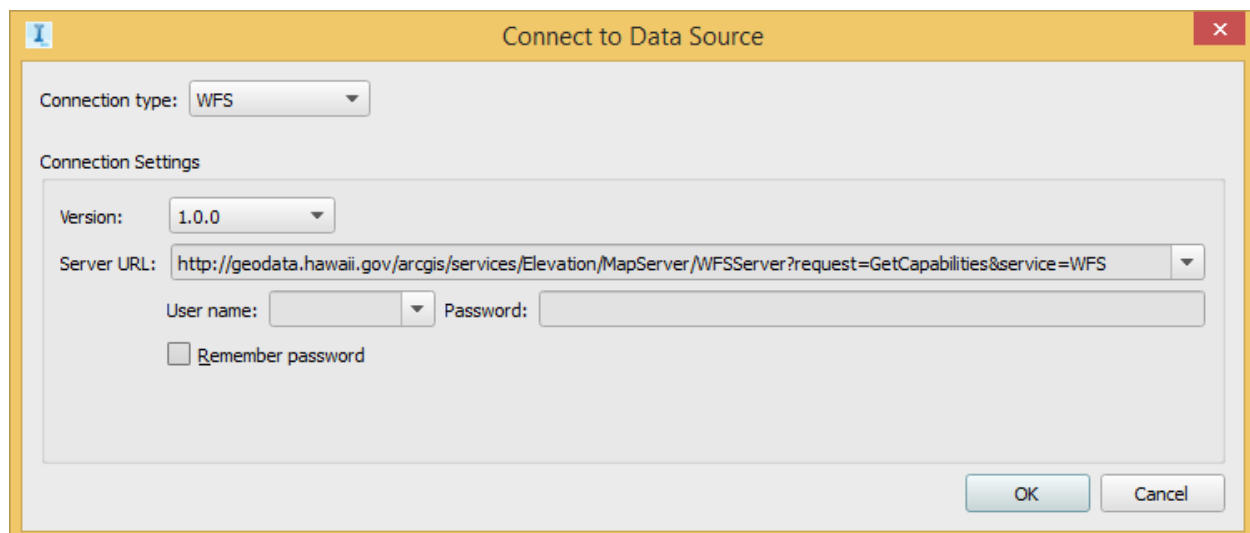
1. Press the , then press the  **Create & Manage Your Data**, then press the .



2. The Data Sources Panel should open on the right side of your screen. Press the .

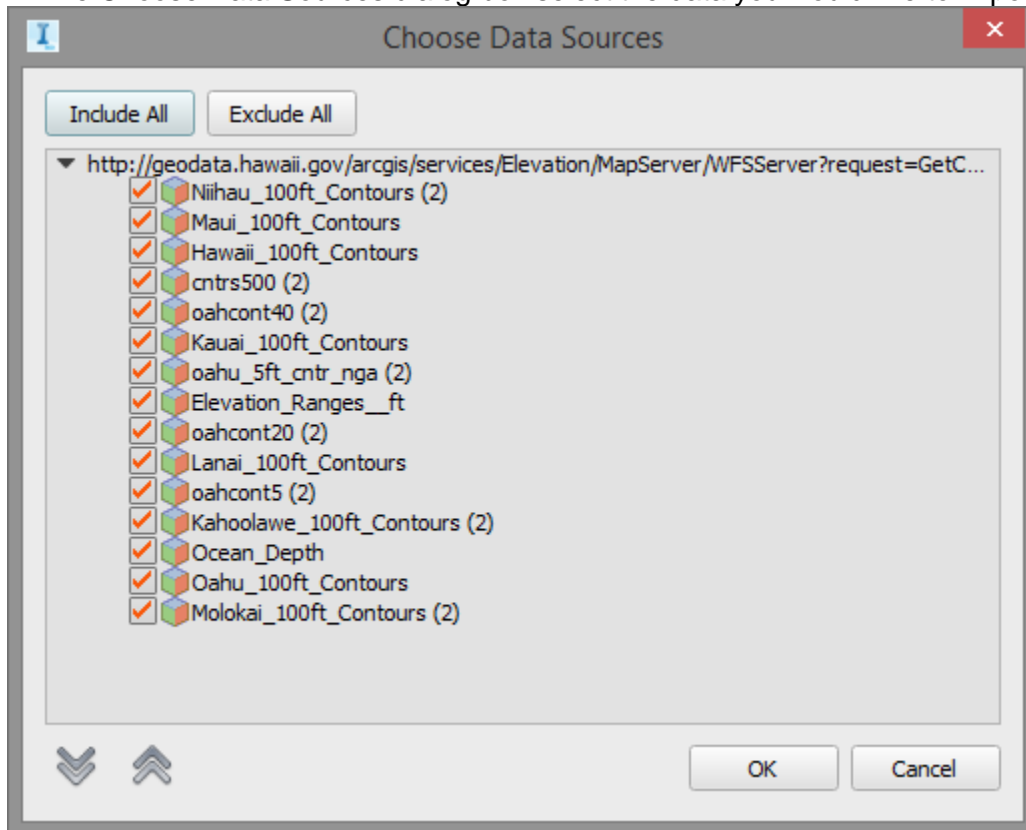


3. In the Connect to Data Source dialog box, under Connection Type switch to "WFS". In the Server URL paste a WFS URL. Tip: most free ones do not require a user name or password so just PRESS OK.
<http://geodata.hawaii.gov/arcgis/services/Elevation/MapServer/WFSServer?request=GetCapabilities&service=WFS>

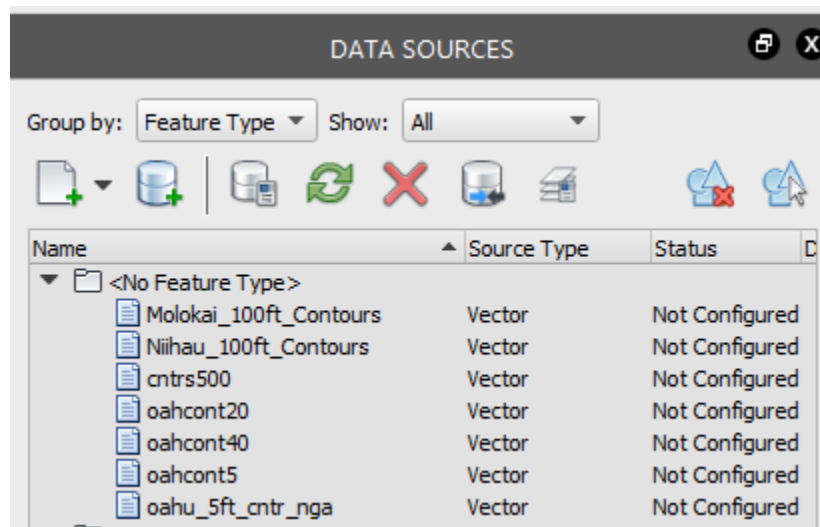




4. In The Choose Data Sources dialog box select the data you would like to import.



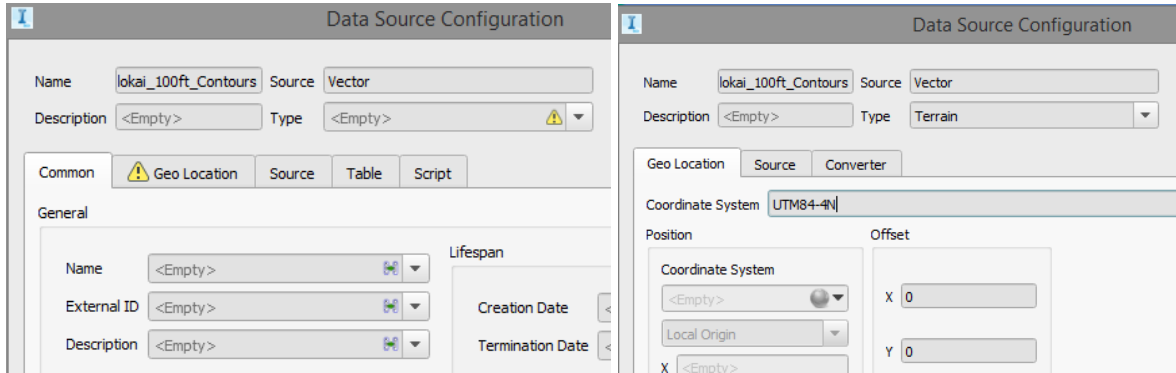
5. By default, your data will be located in the Data Source List under <No Feature Type>. Double Click on the data you would like to configure.




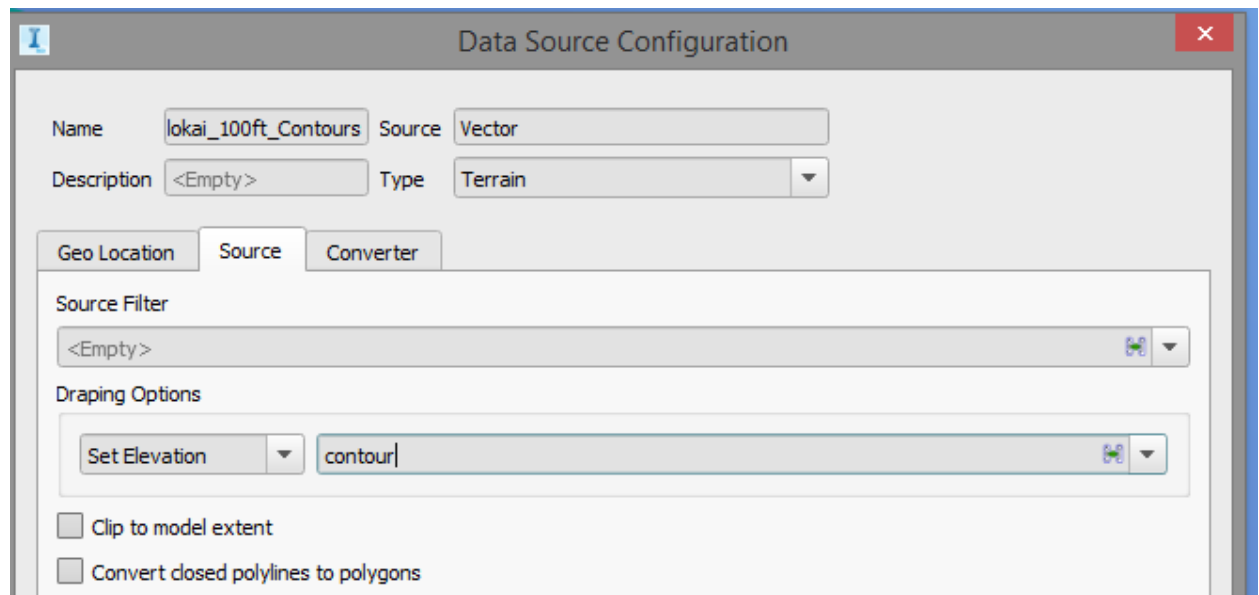



6. In the Data Source Configuration dialog box change the Type to the appropriate data type. For a complete description of Data Types scroll down to Additional tips on this page: <https://knowledge.autodesk.com/support/infraworks-360/learn-explore/caas/CloudHelp/cloudhelp/ENU/InfraWorks-UserHelp/files/GUID-BC352F0B-C1BA-423E-97A5-E71D1D0337D2-htm.html>

You also need to address the Geo Location tab and set the appropriate project coordinates.






7. When importing Terrain, you must configure the Source Tab. Under Dragging Options change to Set Elevation and in the field parameter select the down arrow  and find the data field that would give you elevation data like contours.

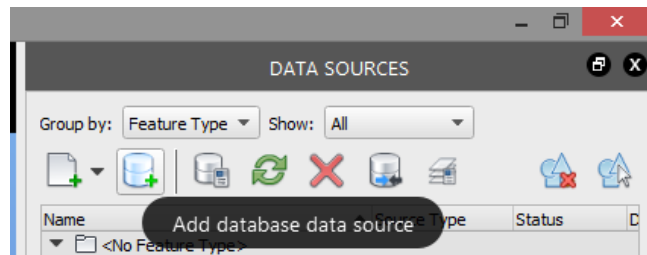


8. Press the Close and Refresh. Then go to Starbucks  and get a coffee while it processes your data.

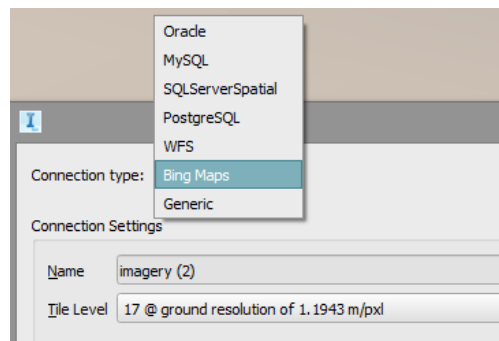




Adding Imagery to your Map Data Sources in InfraWorks 360

1. Press the , then press the  **Create & Manage Your Data**, then press the .
2. The Data Sources Panel should open on the right side of your screen. Press the .



3. In the Connect to Data Source dialog box, under Connection Type switch to "Bing Maps". Under Tile Level select the resolution you desire. Tip the higher the resolution the longer it will take to download. Level 8 will download in minutes, level 17 will take hours.



4. PRESS OK when ready. Then go to Starbucks   and get a coffee while it processes your data.



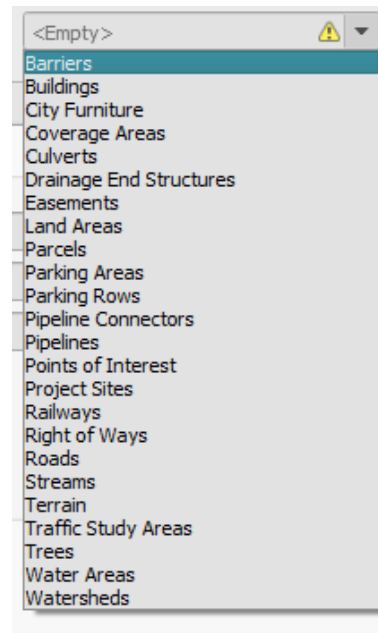
Import other SHP files:

Once have download your SHP files and know what coordinates they are in you are ready to go. First you should know what type of data you are importing:

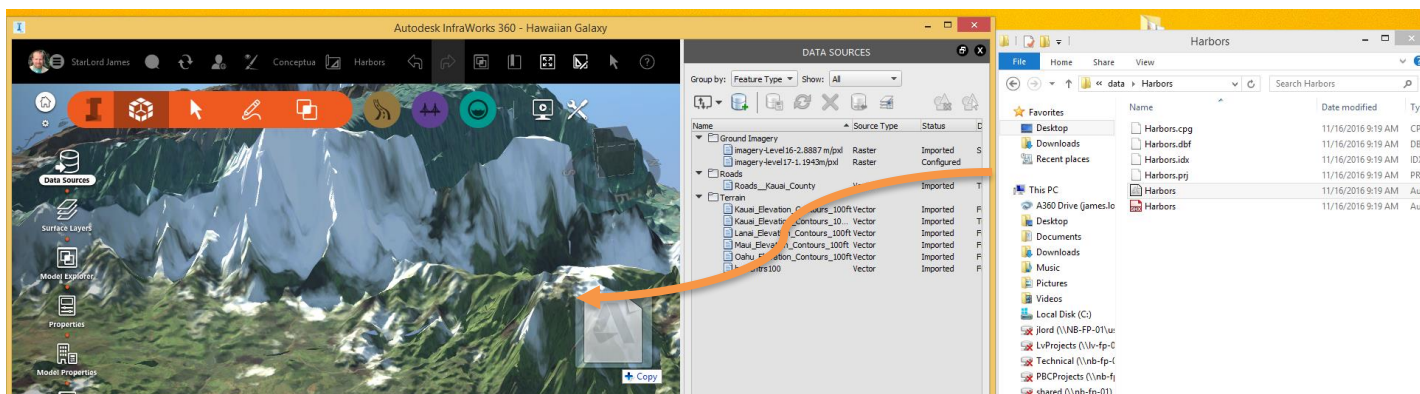
Additional tips

Follow the links below for configuration information about specific data source types.

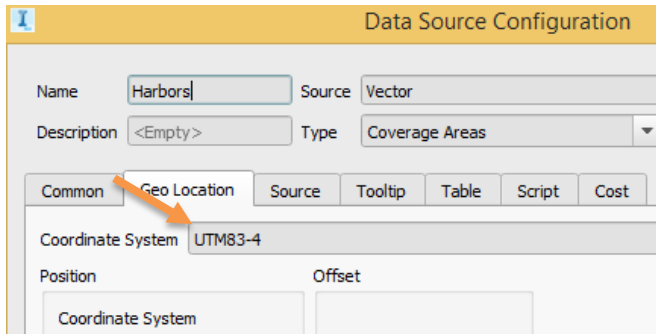
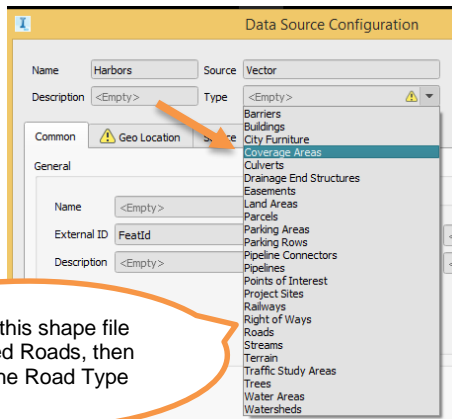
- [Terrain](#)
- [Point clouds](#)
- [Coverage areas](#)
- [Bodies of water](#)
- [Buildings](#)
- [Roads](#)
- [Railways](#)
- [Trees](#)
- [City Furniture and Barriers](#)
- [Pipelines](#)
- [Pipeline Connectors](#)
- [DWG Line Data](#)
- [Autodesk IMX data \(from Civil 3D, etc.\)](#)
- [3D Models](#)
- [City GML](#)
- [Revit](#)
- [AutoCAD Utility Design](#)



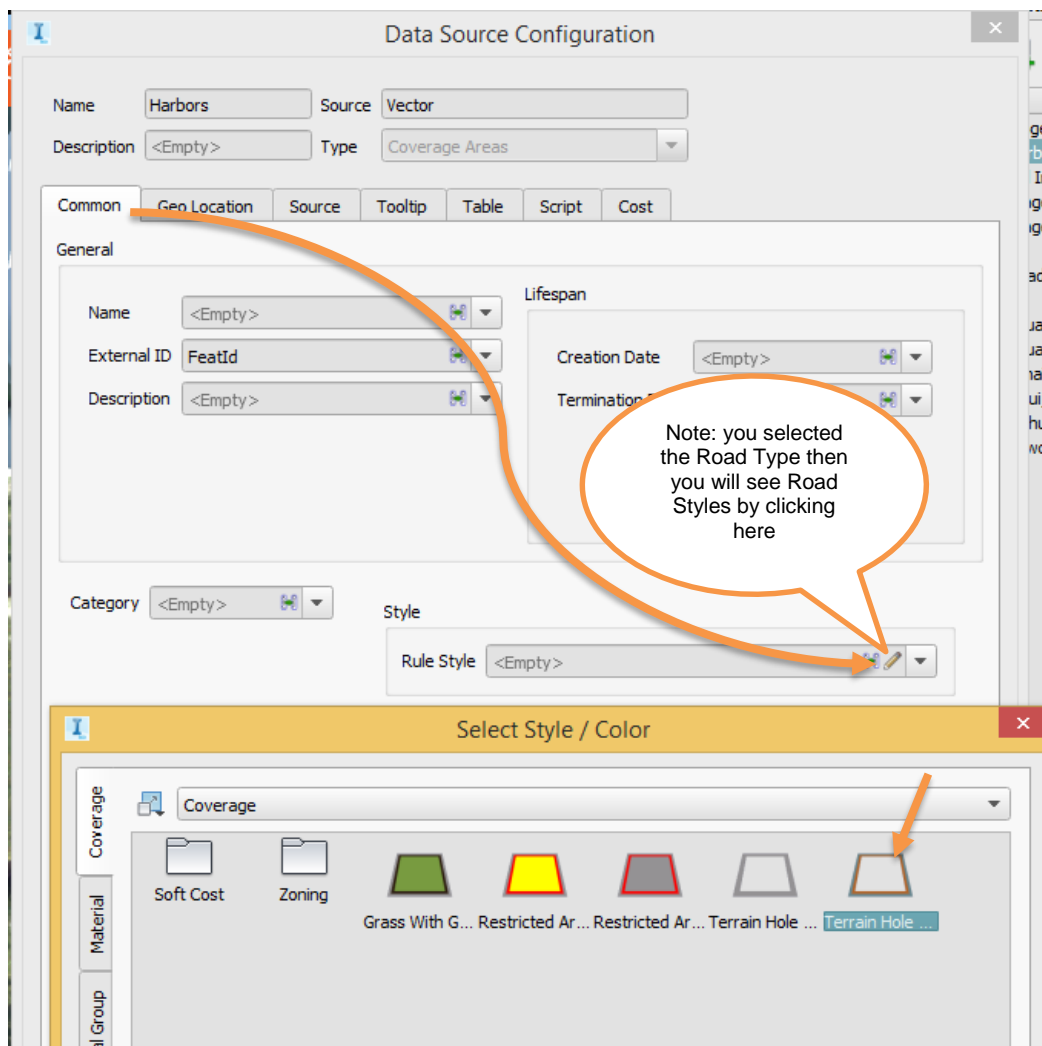
1. Open the model you would like to add the SHP file to. Then just drag the SHP file from Windows Explorer and drop in the model.



2. One the Data Configuration dialog box under Type, tell Infracworks what your data is. In this case it is an outline of the harbors so I will select either parcel or coverage area.



3. Click on the Common tab and under Style, pick the styles you want your coverages to be displayed at.

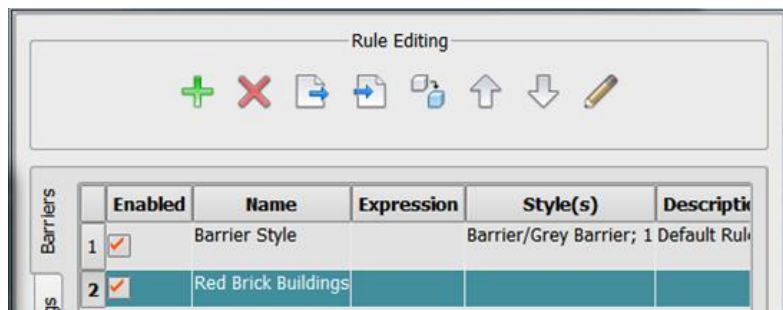




4. The press OK and Close and Refresh.

TIP for assigning multiple styles to say different types of vegetation or different road styles based on classes. Use this to define style rules:

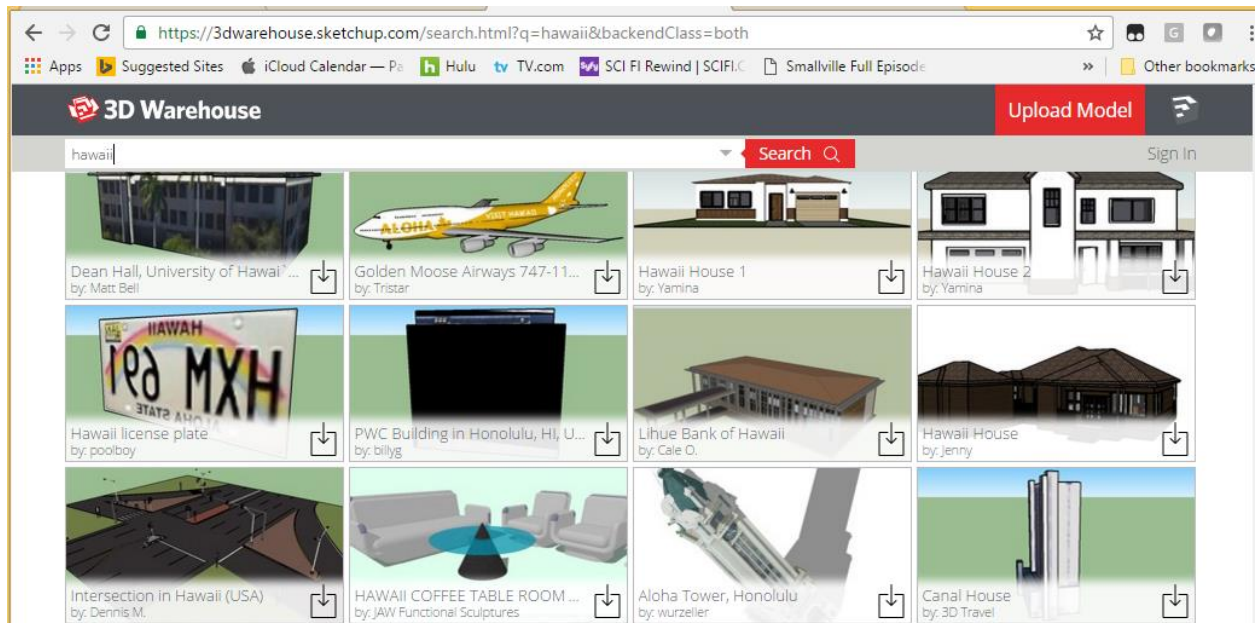
<https://knowledge.autodesk.com/support/infraworks-360/learn-explore/caas/CloudHelp/cloudhelp/2015/ENU/InfraWorks-UserHelp/files/GUID-4279B93A-99B6-4DF3-87B7-A10F64C4688B-htm.html>



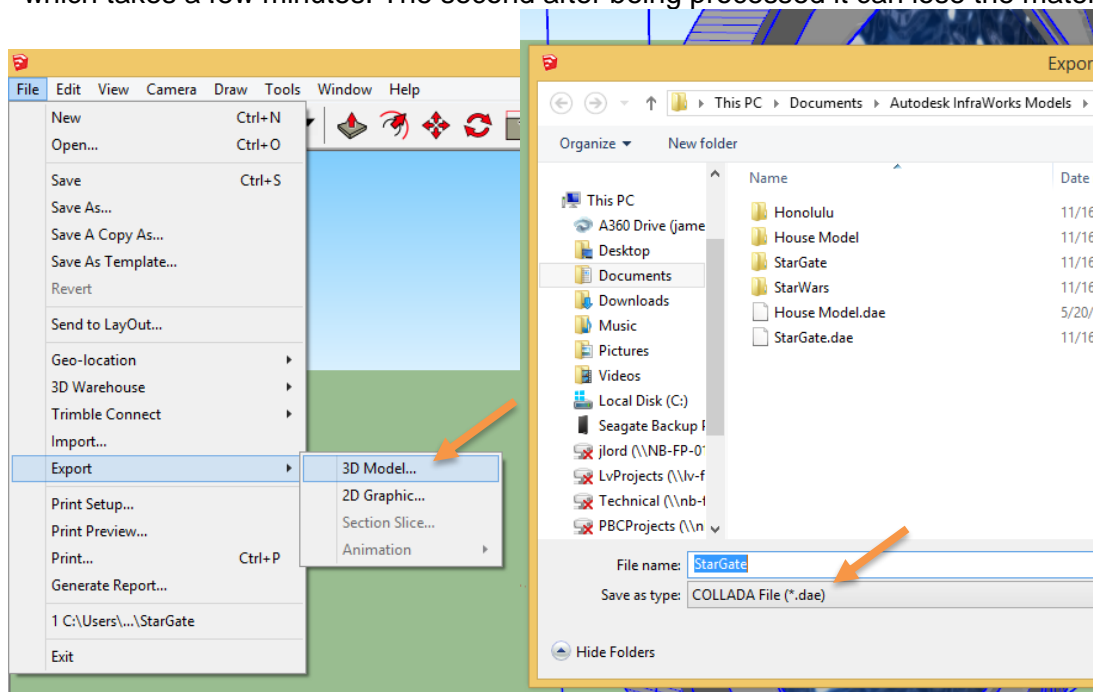


Adding Sketchup Models to your InfraWorks 360 model





1. Download you model from the Trimble Warehouse: <https://3dwarehouse.sketchup.com/>

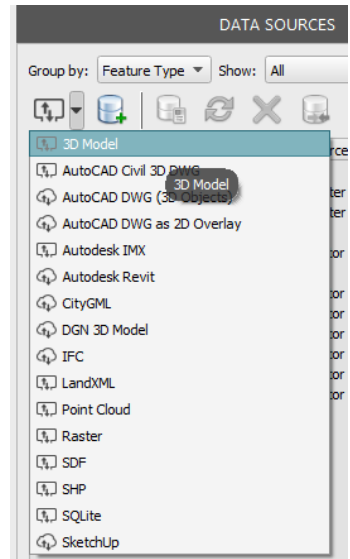


2. Open that model in Sketchup and Export it to a DAE file. (We will call this baptizing. One of the reasons is AIW360 makes you submit your SKP file into the cloud to be processed which takes a few minutes. The second after being processed it can lose the materials.)

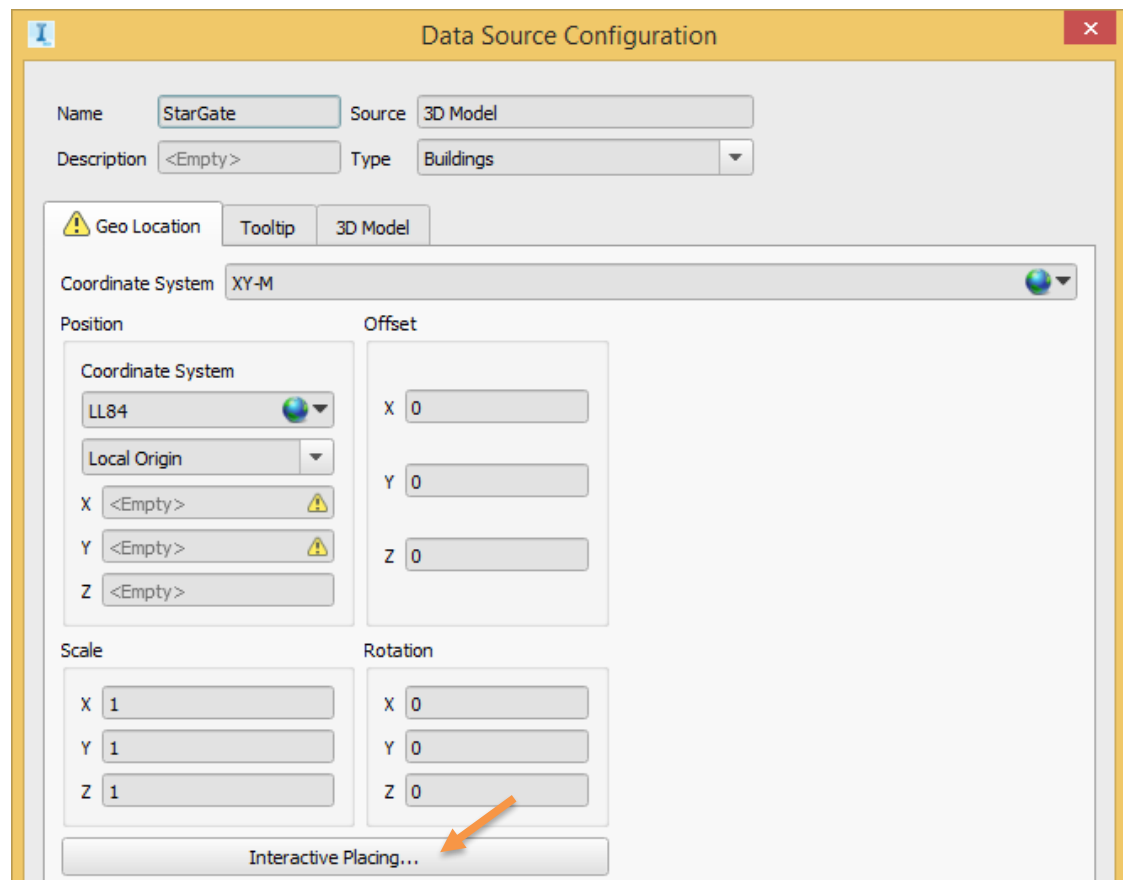




- Press the , then press the  **Create & Manage Your Data**, then press the  Data Sources button.
- The Data Sources Panel should open on the right side of your screen. Press the  Add File Data Source button.
- Select "3D Model" from the list.
- Double Click on Stargate Model and it will open the Data Configurations dialog box.

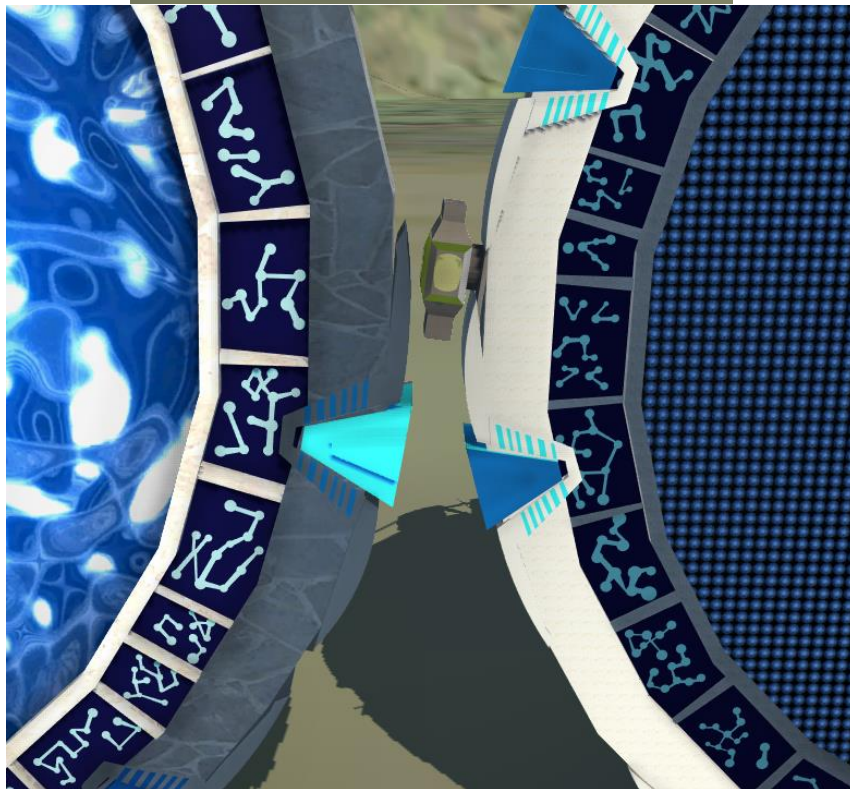
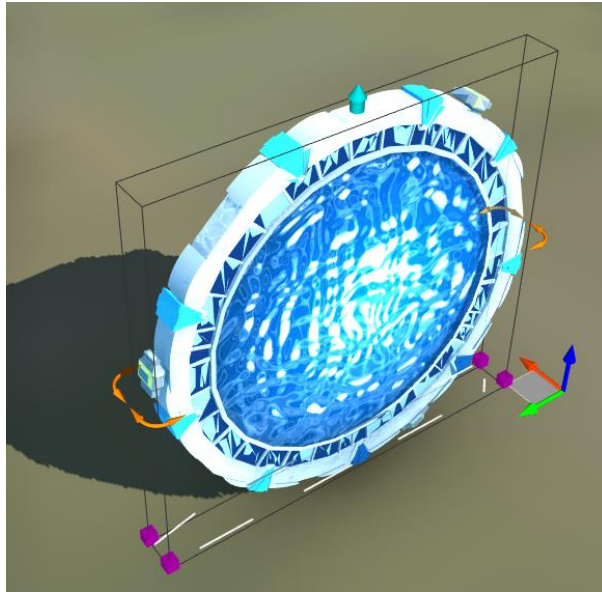


- Under Type, select Buildings, ignore changing any coordinates, unless you have them. Just press the Interactive Placing button and place on the model in the location you want.





8. Play with the various grips to see which ones will rotate, scale, and move your object.

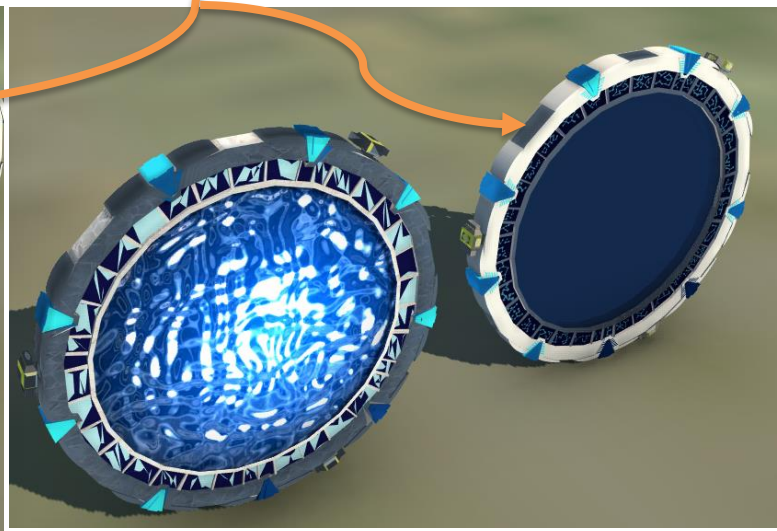
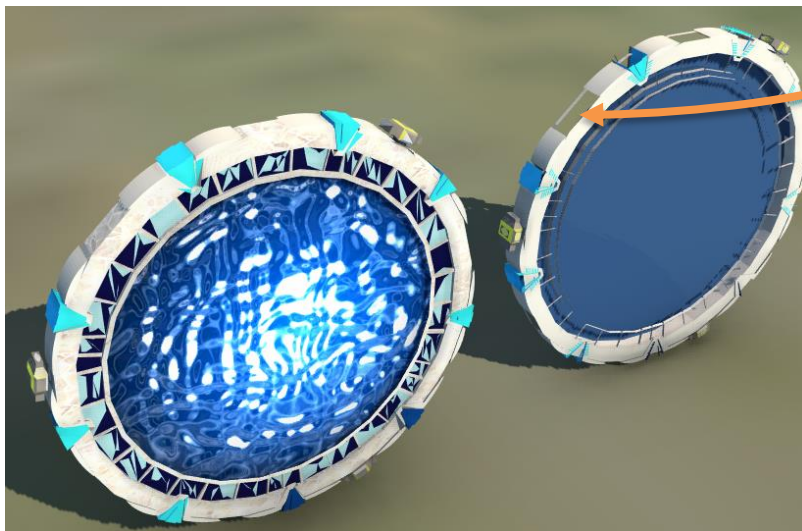
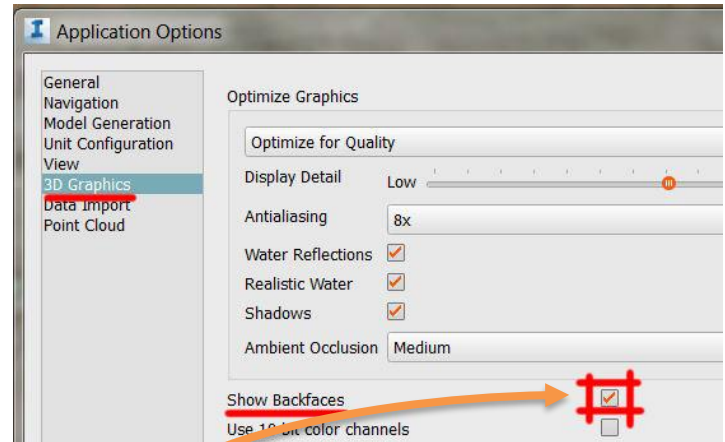


Gate on left was exported from Sketchup as a DAE.
The Gate on the right was a direct import of the SKP file in Infraworks



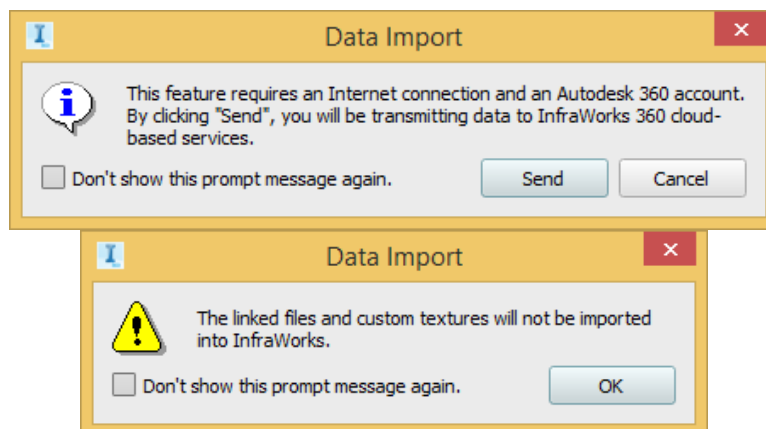
ADVANCED TIP: Components of the Model Missing?

Settings and Utilities> Application Options> 3D Graphics> Select Show Backfaces



DAE Model Left, SKP Infraworks direct import Right
Before Backfaces are turned on With Backfaces turned on

Errors you see when importing a SKP directly into Infraworks





Cleanup your Revit Model before bringing it into InfraWorks 360 model

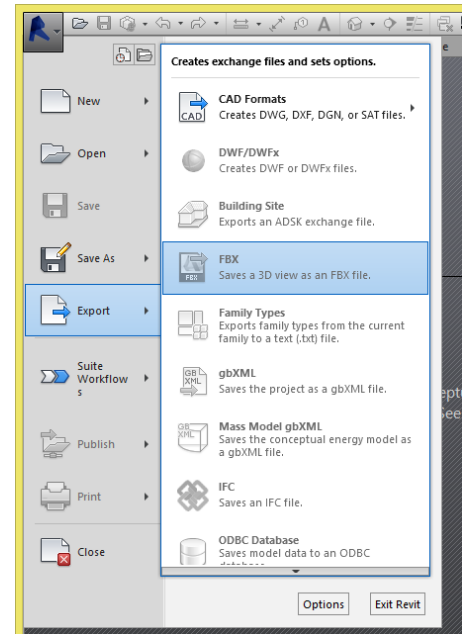
If you have a Revit file using Shared Coordinates, then that is great and we can correctly place it in the real world automatically. If not, like this example I will show you how to get it close for visual clarity.



Imported RVT File



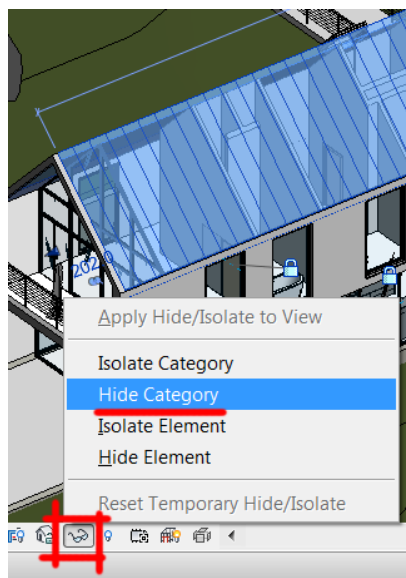
Imported IFC File



Imported FBX File (**Best method, it will update if you make changes in Revit and re-export**)





From Revit: Reduce the Model before Exporting to InfraWorks 360:

1. Select an Element in the Revit Model you want to **keep** [Wall, Glazing, Roof, etc.] Use the Temporary Hide/Isolate [sunglasses icon]> Hide Category command to hide all similar elements.
2. Repeat Hide Category until all Elements you want to keep in your model are hidden.

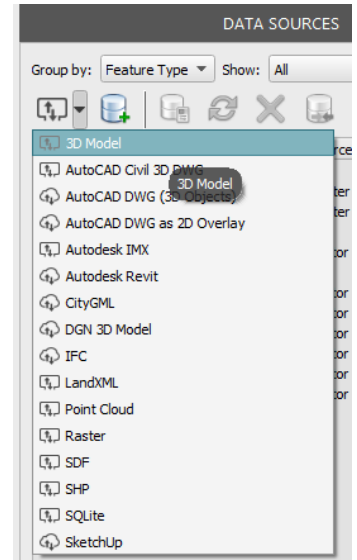




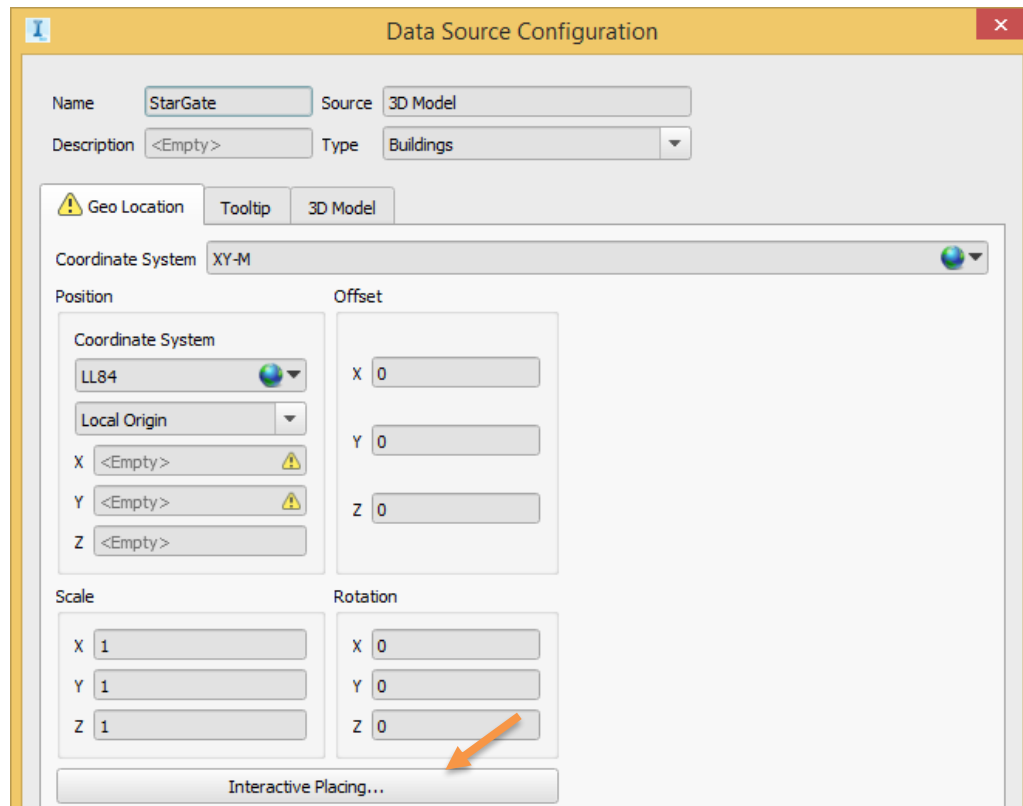
Import your Revit Model (FBX is the best format) into InfraWorks 360 model

1. Press the , then press the  **Create & Manage Your Data**, then press the  Data Sources button.
2. The Data Sources Panel should open on the right side of your screen. Press the  Add File Data Source button.
3. Select "3D Model" from the list. Then browse to the FBX file you created from Revit,
4. Double Click on your FBX/Revit Model and it will open the Data Configurations dialog box.

Name	Source Type	Status
<No Feature Type>		
StarGate	3D Model	Not Configured
Ground Imagery		
imagery-Level16-2.8887 m/pxl	Raster	Imported



5. Under Type, select Buildings, ignore changing any coordinates, unless you have them then use them. If you have no coordinates just press the Interactive Placing button and place on the model in the location, you want.



6. Play with the various grips to see which ones will rotate, scale, and move your object.



Great Infracworks Resources:

InfraWorks Magic: Style Rules using Object Data 101 (Part 1, 2 & 3)

<http://blog.advancedsolutions.com/2014/06/05/infracworks-magic-object-data-101-part-1>

<http://blog.advancedsolutions.com/2014/07/01/infracworks-magic-themes-using-object-data-101-part-2>

<http://blog.advancedsolutions.com/2014/07/07/infracworks-magic-style-rules-using-object-data-101-part-3>

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