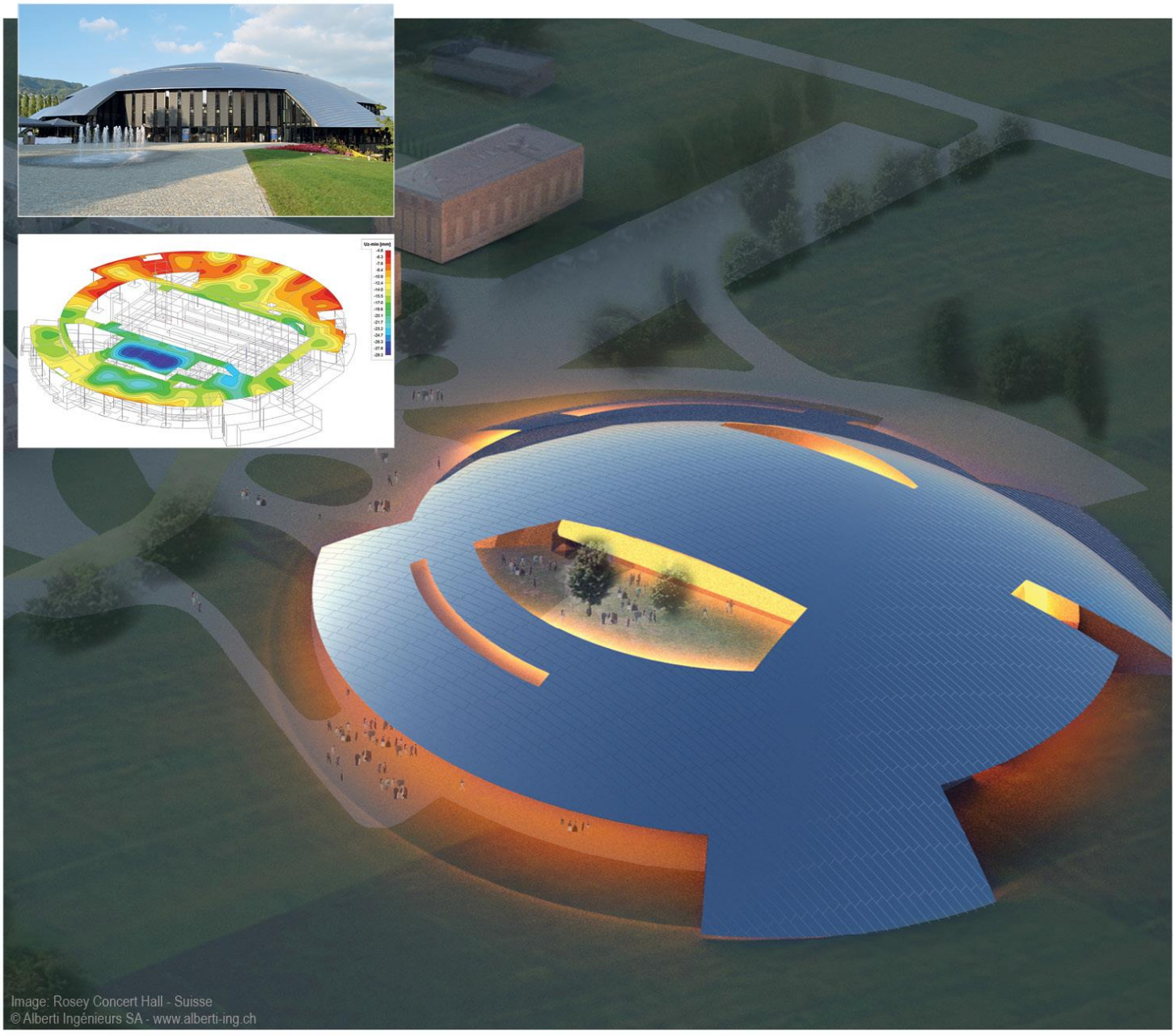
SCIAENGINEER



Tutorial

Linking SCIA Engineer & Autodesk Revit

Release: SCIA Engineer 15
Manual: Linking Autodesk Revit & SCIA Engineer
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Latest version is available on: http://nemetschek-SCIA.com/en/contact/offices

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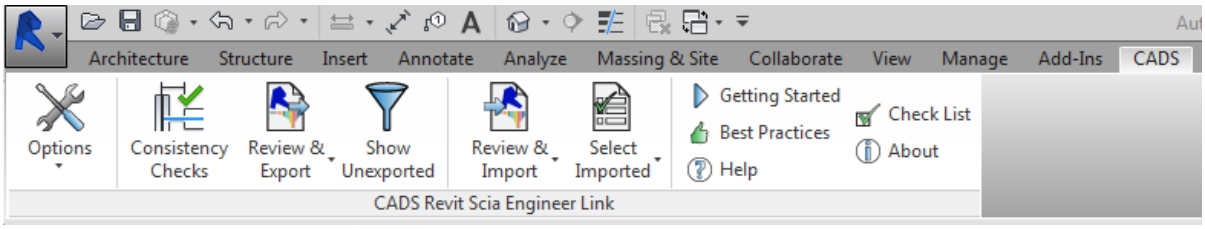
Export via CADS Revit SCIA Engineer Link

Open Revit-SCIA Transfer.rvt from folder

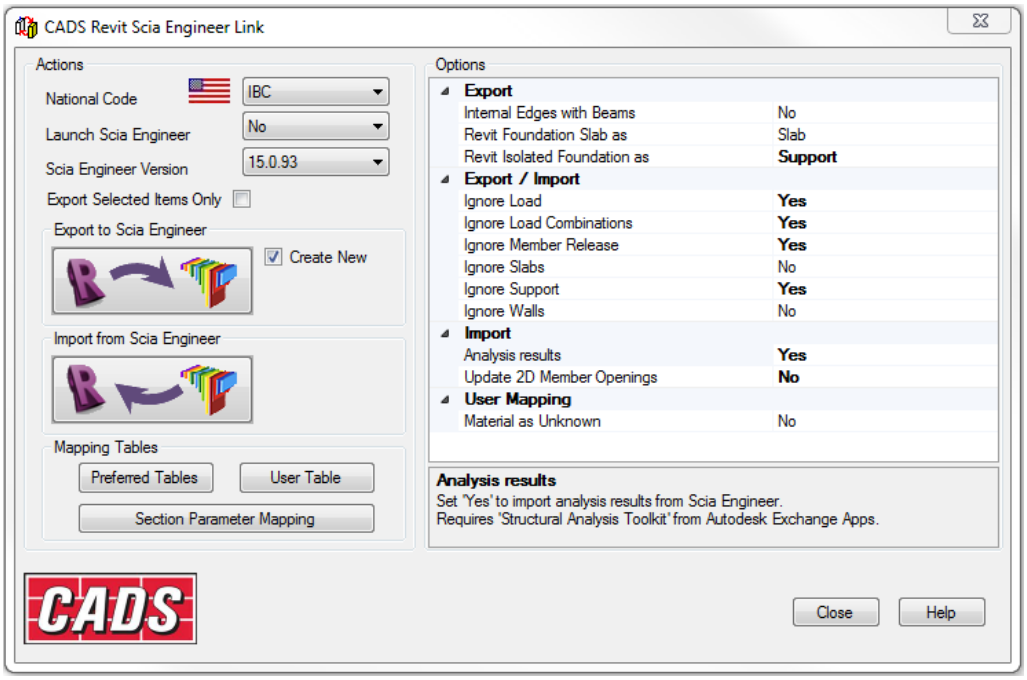
Link Location & Setup

1. Open the CADS Revit SCIA Engineer link by selecting the CADS tab from the list of panels.



2. Select the Options button  to open the options dialogue box.

3. Verify that the following actions are setup:
    a. National Code = IBC
    b. Launch SCIA Engineer = No
    c. SCIA Engineer Version = Browse depending on install version
    d. Export Selected Items Only = Checked
4. Once the actions are setup, it is possible to make modifications to the Options as well.

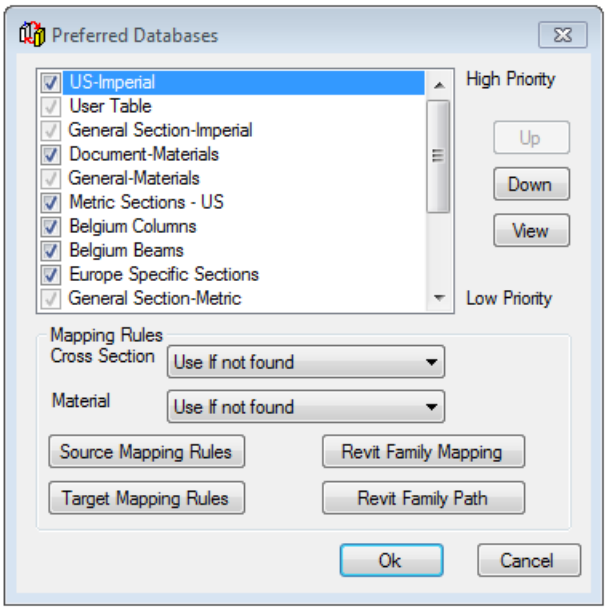


Mapping Tables

The transfer of data between Autodesk Revit and SCIA Engineer is dependent on Mapping Tables. These mapping tables are used to link the Revit Section Name & Family Name to the corresponding SCIA Engineer Section and Catalog name.

1. To access the mapping tables, select the Preferred Tables button in the Option dialogue box of the CADS Revit SCIA Engineer link.

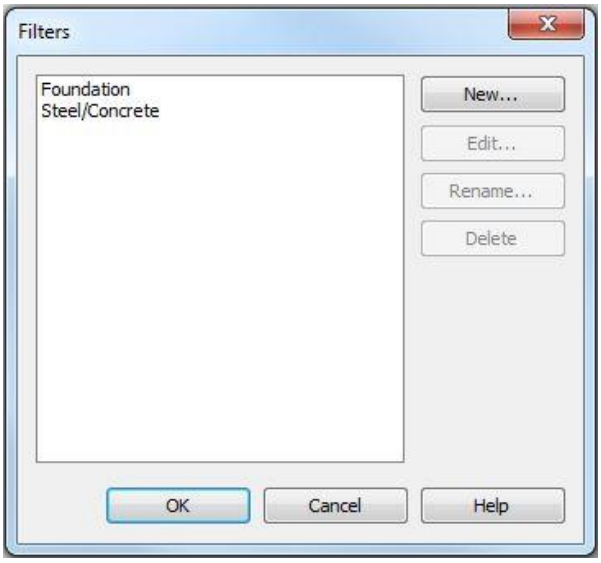
2. In the Preferred Database, it is possible to arrange the pre-installed databases in order of desired priority. In addition, it is also possible to change the mapping rules and add user Revit family paths to the database. For this exercise, set the databases as shown below.



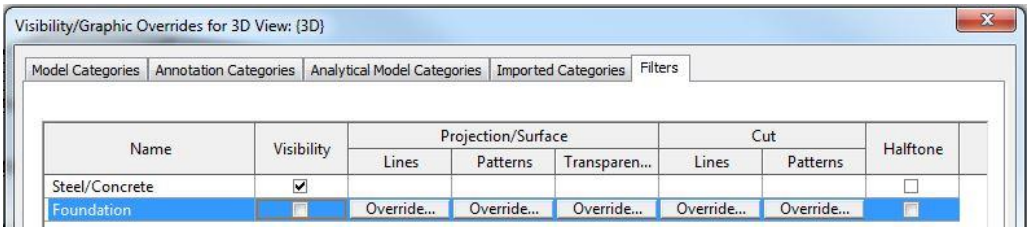
3. The User Table is a listing of items that were either added by the user before running an exchange, or added by the user during the exchange process. The user table will be discussed in more detail later.

Model Visibility and Filters

This model already includes two separate Revit filters. These filters are set up to break apart the model into elements that will be transferred using the link and those that will be transferred using the IFC exchange.

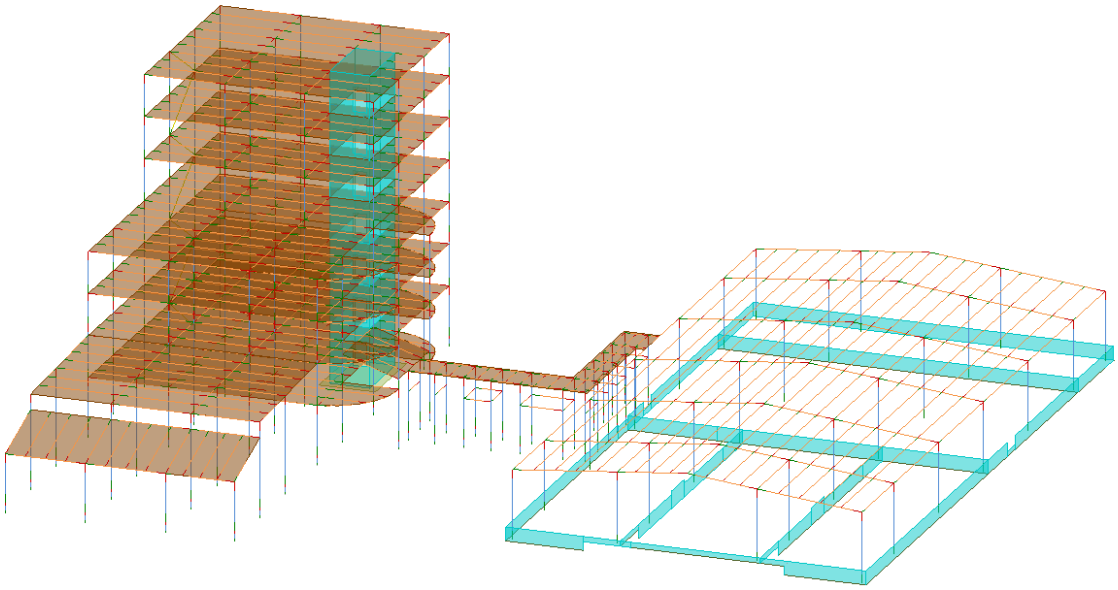


To enable or disable the filters in order to view only a portion of the model, use the Visibility/ Graphics button and navigate to the Filters tab. For the link transfer, disable the visibility of the Foundation filter.



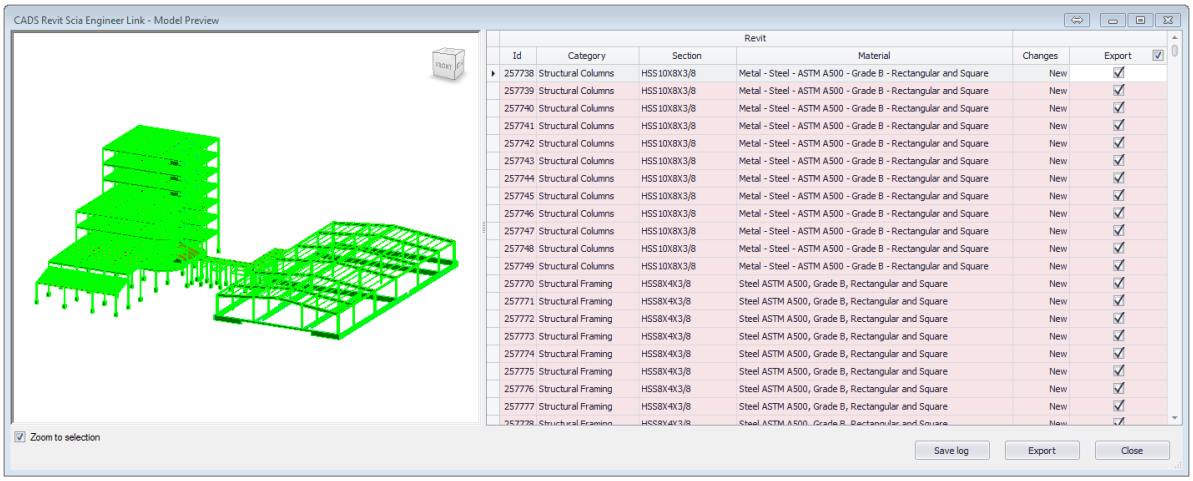
Export to SCIA Engineer (CADS link)

1. When the visibility is properly set, highlight all the items and select the Review & Export button in the CADS Revit SCIA Engineer Link.



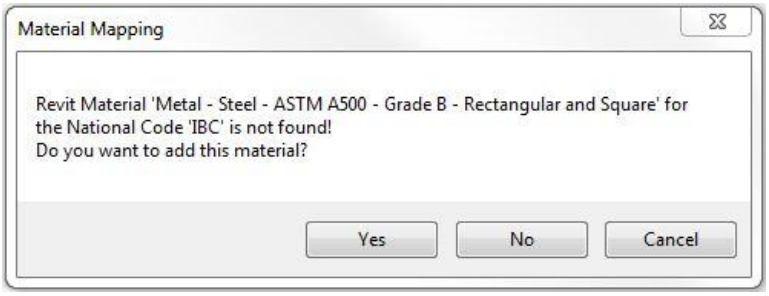
Note: *The transfer between Autodesk Revit and SCIA Engineer is based on a properly constructed analytical model in Revit Structures. All of the information that will be transferred between the two software's in gathered from the analytical model in Revit. If no analytical model is set up, then no information will be exchanged. For more information on the analytical model in Autodesk Revit, as well as Analytical Model tools, refer to Best Practice PDF found in the link as well as other Autodesk documentation.*

2. After selecting export, the export model preview will appear. It is in this interface that specific items can be selected/deselected for export

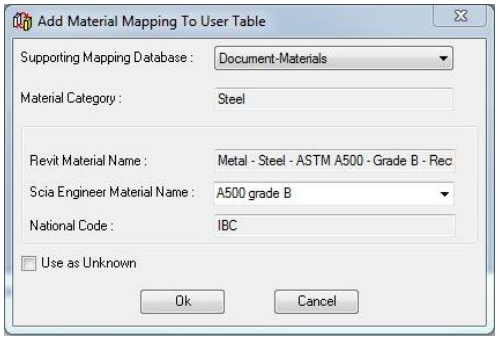


3. After selecting export, the link will prompt the user to save an .r2s (Revit2SCIA) file. Select any location and name and click OK.

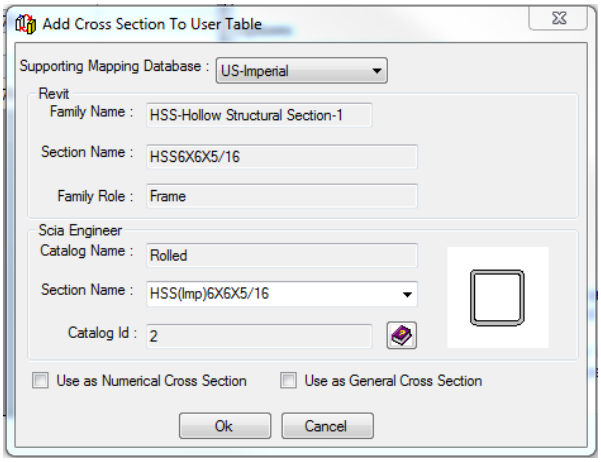
4. First, the link will read the entire Revit model and separate the items to be exchanged into categories. Once the read portion is complete, the model will begin to be exported. During the export process, if the link identifies a Material or Cross Section that is not found in the standard mapping tables then the following dialogue box will appear.



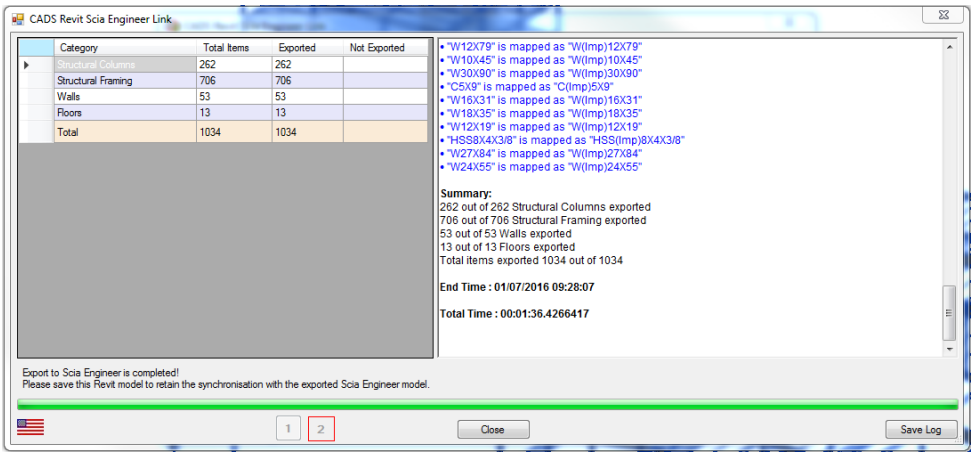
5. Selecting Yes will open the following dialogue box and will allow the user to add the mapping information for the specified Revit material. Set the mapping as shown below and click OK.



6. Complete a similar process for the mapping of the cross section, 3” STD PIPE in the Revit Family, HSS – Round Structural Tubing setting the mapping as shown below. Both the material and the cross section mapping will be saved in the User Mapping Table. Once a material/cross section is mapped by the user, the link will utilize the new mapping for subsequent transfers.

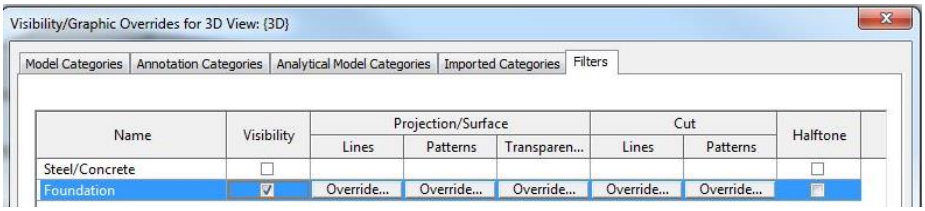


7. When the link has finished the exchange, a list of the mapped cross sections and materials is shown. Also, shown is the total number of items exported. It is also possible to save a log of the exchange to a Word file.

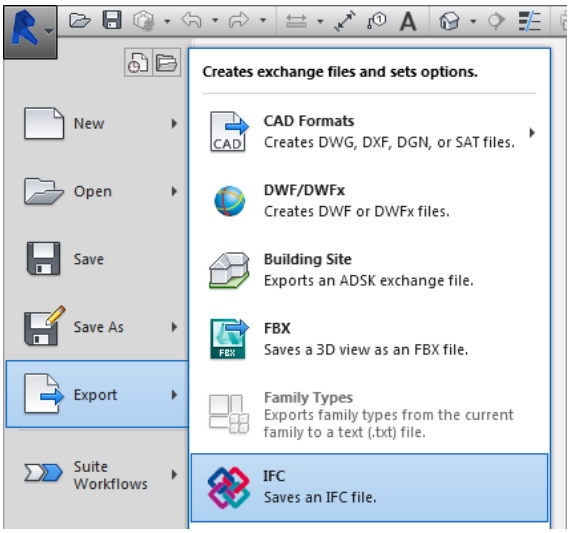


Export via IFC (Industry Foundation Class)

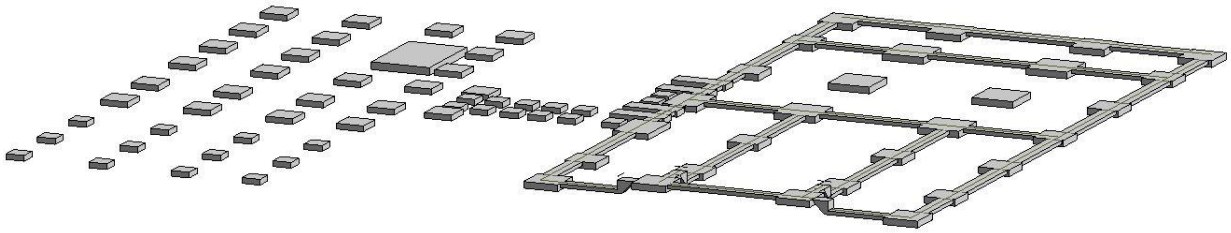
1. The remaining items in the model (Foundations) will be transferred using the IFC file format. In order to properly exchange the foundation information, change the Filter in View > Visibility/Graphics so the Foundation filter is checked on.



2. Once only the foundation elements are shown, select all the elements and navigate to Revit button > Export > IFC file.



3. Select a location, file name and make sure that you are exporting only the “Current View” so that only the elements that are selected are exported.



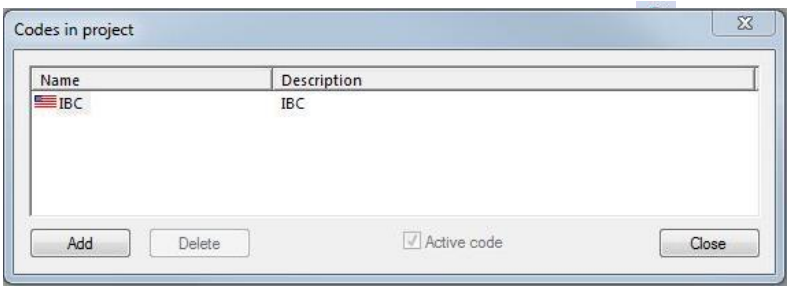
4. When the export is complete, Autodesk Revit can be closed.

Import into SCIA Engineer

Now that the .r2s file and the IFC file have been exported from Revit Structures, the user can import both and combine them into one file in SCIA Engineer.

Import .r2s file

1. To import the .r2s file, navigate to File > Import > Revit file while in SCIA Engineer.
2. Navigate to the location for the saved .r2s file and open it.
3. Once the file is opened, the user has the option to select the code used for the SCIA Engineer file. Make sure that the code used in Revit Structures matched the code used in SCIA Engineer. If a new code needs to be added, select the Add button to change the code.

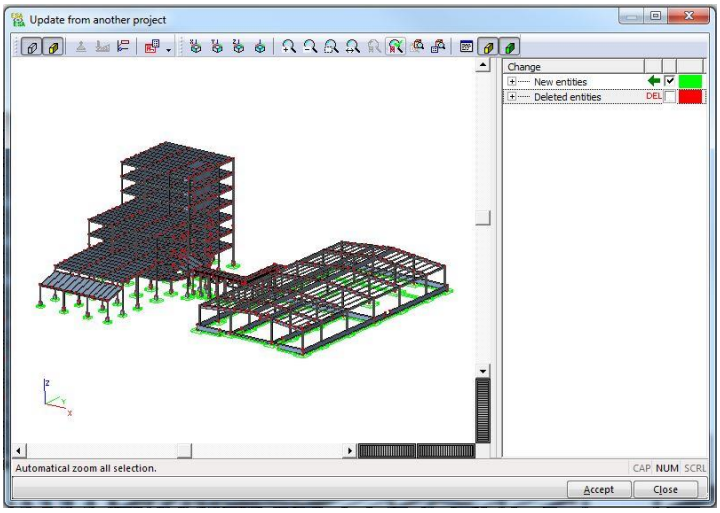


4. Select Close and the file will be imported. Use the Zoom All button  to show the entire model.

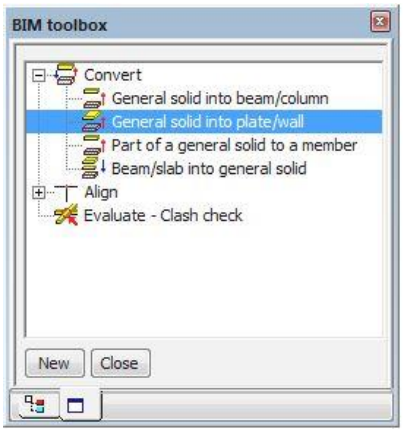
Import IFC file

1. To import the IFC file into the same SCIA Engineer file, navigate to File > Update > IFC2x3 and select the saved IFC export from Revit Structures.
2. When the IFC Import Options dialogue appears, modify the setting for the import of the geometry as follows and click OK.

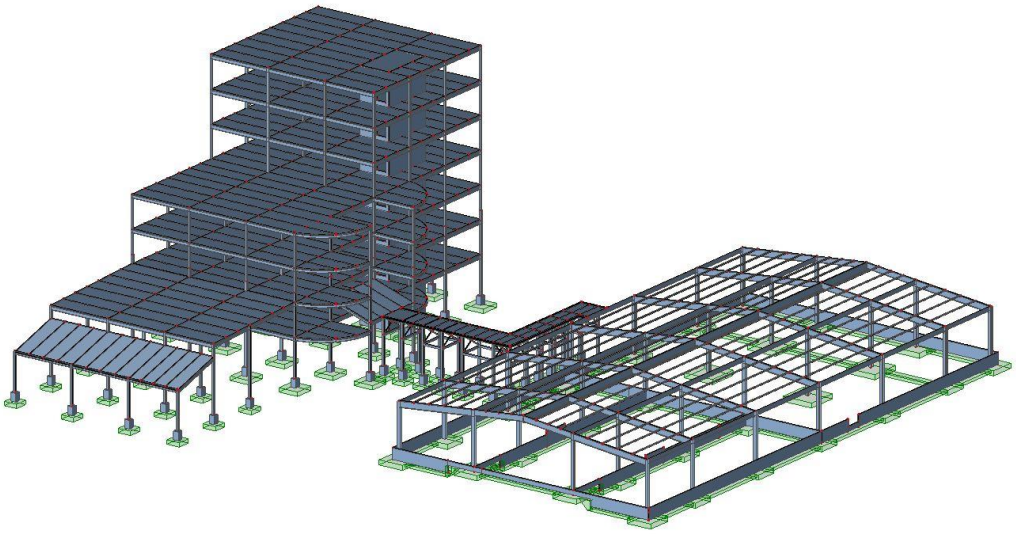
3. The IFC file will be imported and the Update dialogue window will open. From the update window, the new entities are identified in Green, while the existing entities are identified in Red. It is now possible to select the entities that should remain in the update. Uncheck the box for Deleted Entities and click Accept. Once the changes have been accepted, the dialogue can be closed.



4. The model is now updated and aligned with the foundation elements inserted as General Solid geometry. This geometry can now be dealt with in a variety of different ways. It is first possible to convert the foundation elements into plate elements using the BIM toolbox and the Convert General Solid into Plate/Wall command.



5. If conversion isn't desired, the entities can remain as general solid or reference geometry and support conditions (nodal, line, surface, etc.) can be added.
6. The final model in SCIA Engineer after the transfer from Autodesk Revit is shown below.



Import changes & results to Autodesk Revit

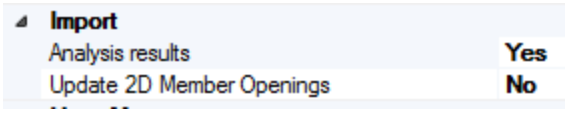
Now that the project has been loaded, analyzed and designed the modified geometry and results can be sent back to Autodesk Revit for documentation and coordination.

Import .r2s file into Autodesk Revit

1. Open SCIA Engineer file, SCIA-Revit Transfer_Results. This file already has loading and results.
2. Navigate to File > Export > Revit file to create new .r2s file.
3. In order to import analysis results, users must install the Structural Analysis Toolkit 2015 that is available for Autodesk Revit. The toolkit can be downloaded for free from the following link:

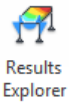
   https://apps.exchange.autodesk.com/RVT/en/Detail/Index?id=appstore.exchange.autodesk.com%3Astructuralanalysistoolkit2015_windows64%3Aen
4. Open Autodesk Revit and start a new project.
5. With a new project open, access the CADS tab and select Review and Import 

in order to import the file that was exported from SCIA Engineer. Make sure that the link options are set up to accept new analysis results.

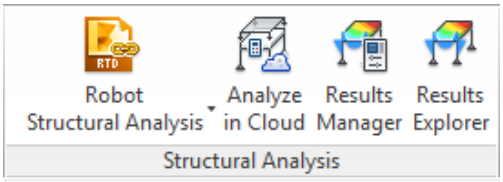


6. Once the file has been imported, select the 3D Analytical Model View.

Access Structural Analysis results in Revit

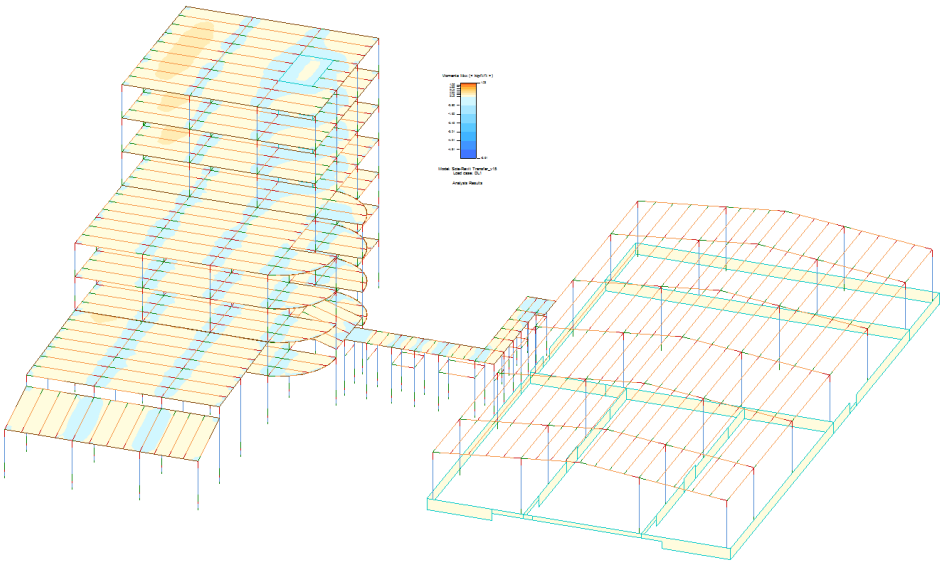
1. Next, the Structural Analysis functionality can be accessed from the Analyze tab.
2. Select the button for Results Explorer 

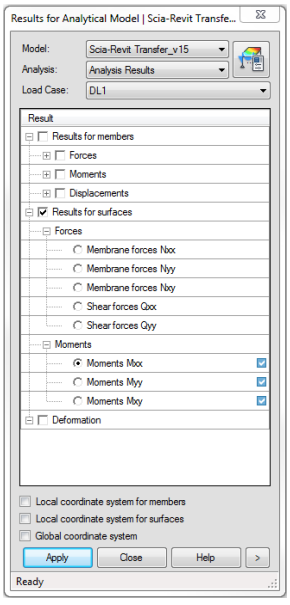
import the analysis results from SCIA Engineer to Revit.

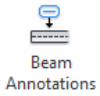


to

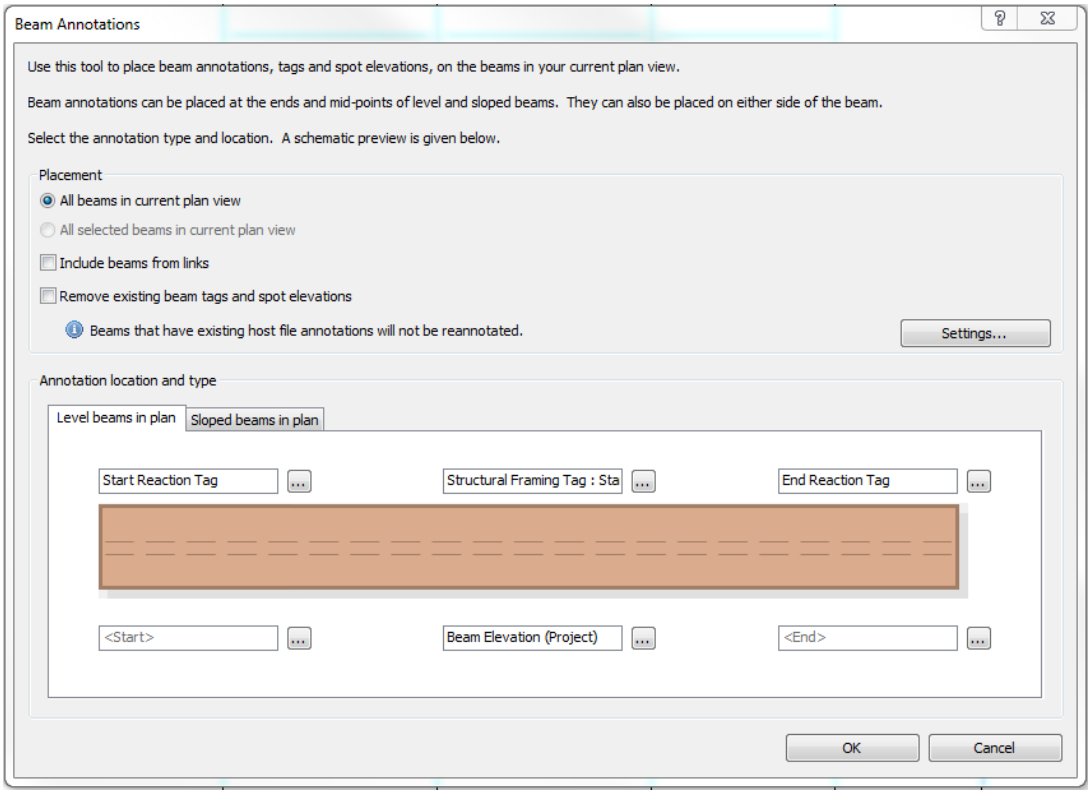
3. With the results imported, open up the 3D View > Analytical Model, select a load case and result type and then click Apply.
4. The structural analysis toolkit will now show the forces, moments or deformations on the 3D model.





5. It is also possible to export internal forces on beams as reaction “tags” to be used to document the beam end reactions.
6. Navigate to the View tab and add Structural Plan View for Level 7.
7. Navigate to the Annotate tab and select the button for Beam Annotations 

8. In the Beam Annotations dialog add the Structural Framing Tags for the Start & End Reaction Tags



9. Clicking OK will add the Beam End Reactions to the beams in the plan view.
10. The maximum beam reactions that are shown on the plane view of the structure coincide with the maximum shear value (Vz) at either end from all of the available combinations. For additional information on analysis results and beam reactions, refer to the CADS Revit Link Help guide installed in Revit.