StruSoft
Structural Design Software

StruSoft StruXML Revit Add-In

New Features Guide | version 1.1.007

StruSoft AB
Fridhemsvägen 22
SE-217 74, Malmö, Sweden
www.strusoft.com

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Disclaimer

The StruSoft StruXML Revit Add-In is a tool that enables a link between Revit and FEM-Design. However, the user must understand the assumptions and restrictions that are described in this document.

Considerable time and effort have gone into development and testing of the StruSoft StruXML Revit Add-In. We have done our best to ensure the reliability of the software and the accuracy of this document. However, the user must accept that no warranty is given by the developers or distributors concerning accuracy of this software or information found in this document.

Anyone that has doubts concerning the accuracy of the StruSoft StruXML Revit Add-In, or has suggestions regarding development of the StruSoft StruXML Add-In, is welcome to contact us at: iwona.budny@strusoft.com.

For support, please use: support.femdesign@strusoft.com. When sending support question, please remember to always attach an original Revit / FEM-Design model, struxml file, and in case of Import to Revit – a Revit rvt file, as well us explain which version of FEM-Design and StruSoft StruXML Revit Add-In have been used.

Current link versions

For FEM-Design 15.01	- StruSoft StruXML Revit 2016 Add-In 1.1.007 - StruSoft StruXML Revit 2017 Add-In 1.1.007
Up to FEM-Design 14	- StruSoft StruXML Revit 2016 Add-In 1.1.004

Compatibility

- Revit/Revit Structure: version 2016 and 2017

Download

- FEM-Design Download Center
- StruSoft Installer

Tutorials and Tips and tricks

- FEM-Design – Revit Integration
- StruSoft blog
- StruSoft Official YouTube channel
- Discussion forum

New features

This document describes the new features introduced in the StruSoft StruXML Revit Add-In 1.1.007, as well as lists the recognized issues that once can encounter when using Export StruXML tool.

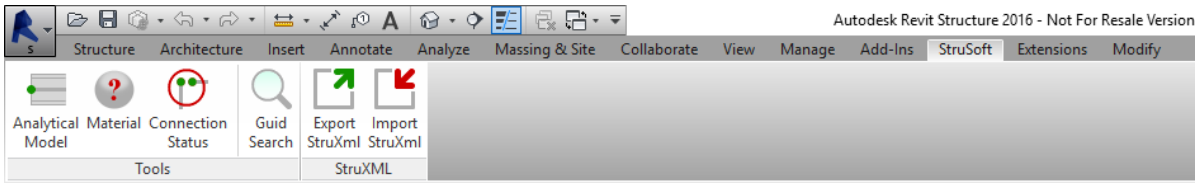
The list of all new features:

- New design of StruSoft tab.
- Tools:
  - Analytical model check,
  - Structural material check,
  - Connection status view.
- Export unmapped sections.

New Features Guide video is available here.

StruSoft tab

StruSoft FEM-Design panel is no longer placed in the Analyze tab. Instead, after completion of the installation process, a new StruSoft tab will appear as shown in figure below.



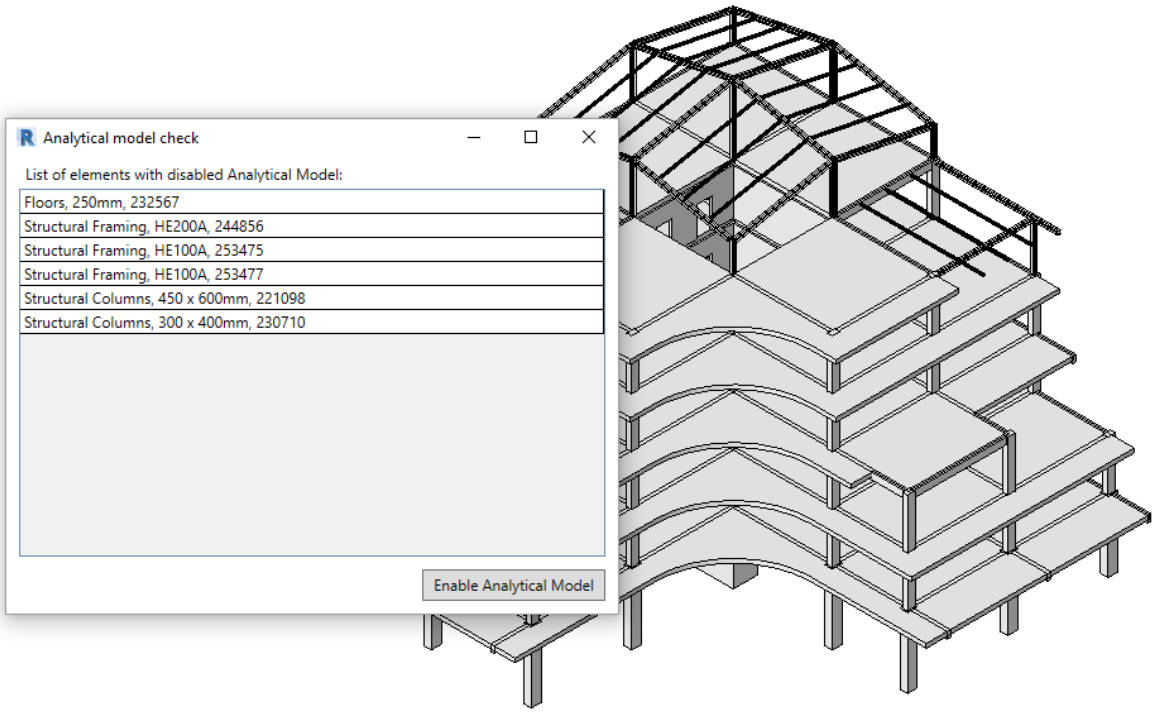
Tools

Three new tools are now available in the StruSoft tab, in the Tools panel. The tools are helpful in preparation of the Revit model before the export, and are sort of “shortcut” for actions that can be done manually in Revit.

It is important to understand that the tools do not bring any new functionality to Revit, but only use the existing Revit functions.

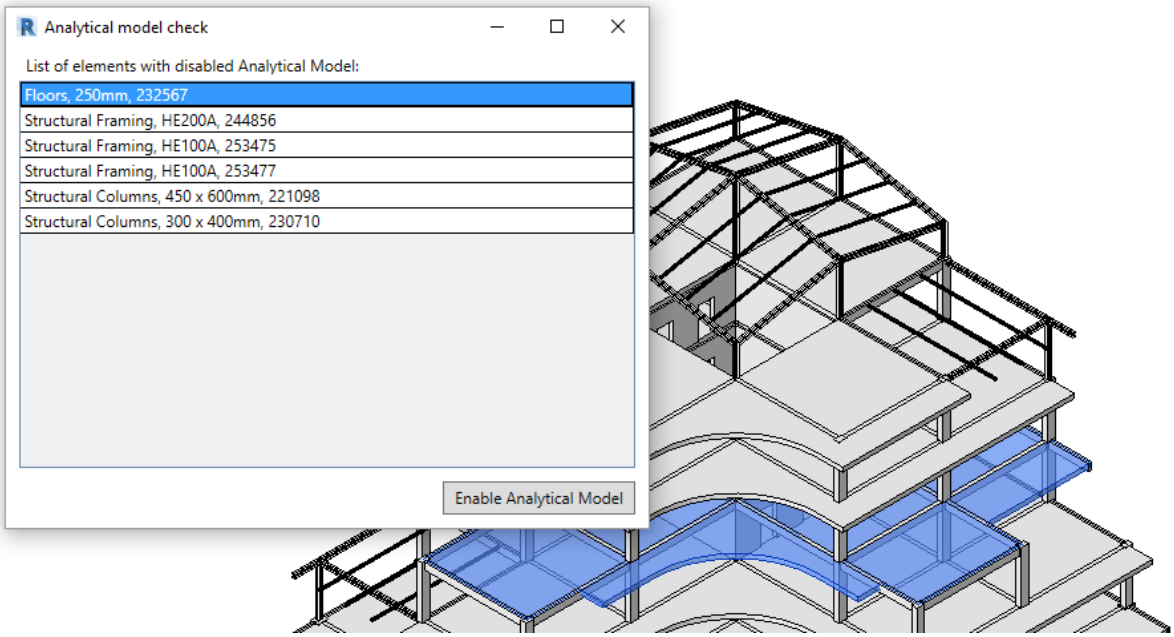
1. Analytical Model

Click on *Analytical Model* tool in order to check if all structural objects in your model have analytical model enabled. *Analytical model check* dialog will appear with a list of all objects without analytical model, as shown in figure below (if all objects in your model have analytical model enabled, the list will be empty).

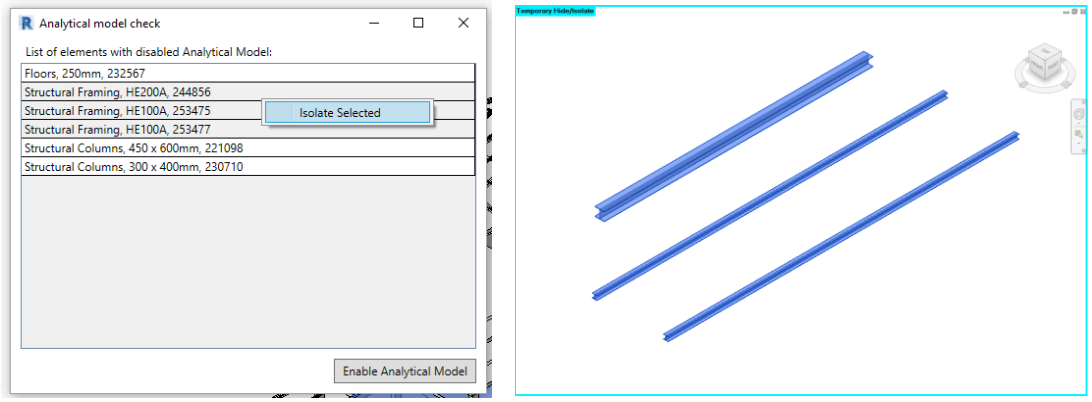


This tool gives you the following options:

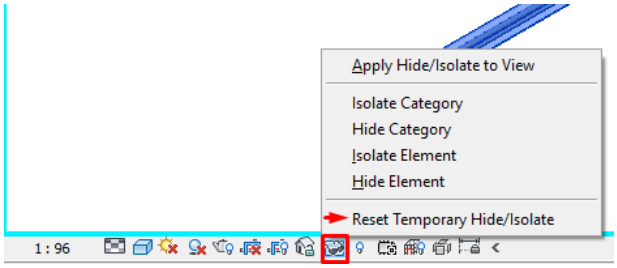
- Double click on one element to highlight it in the model.



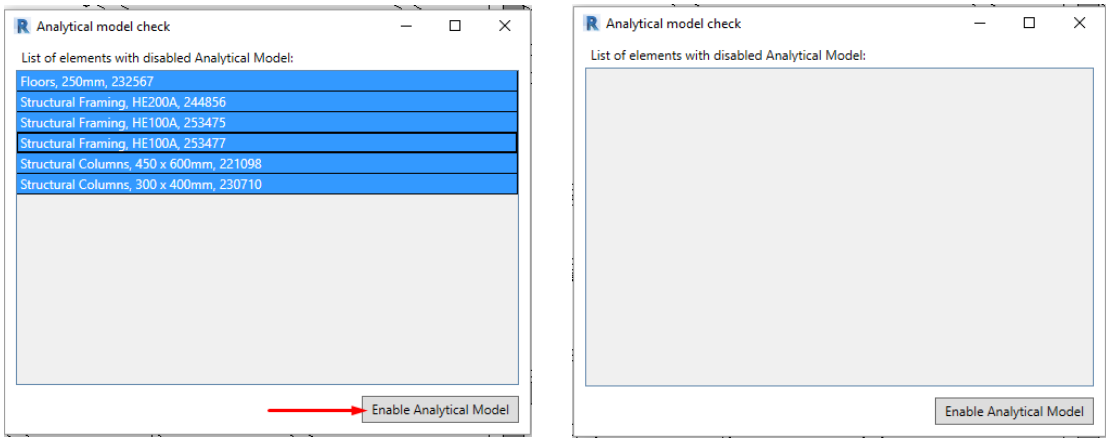
- Select one or more elements (with Ctrl button) and right click, chose *Isolate selected* to isolate them in a view.



Close the *Analytical model check* dialog in order to modify the objects in the *Temporary Hide/Isolate* view. To close the view click on *Reset Temporary Hide/Isolate.*



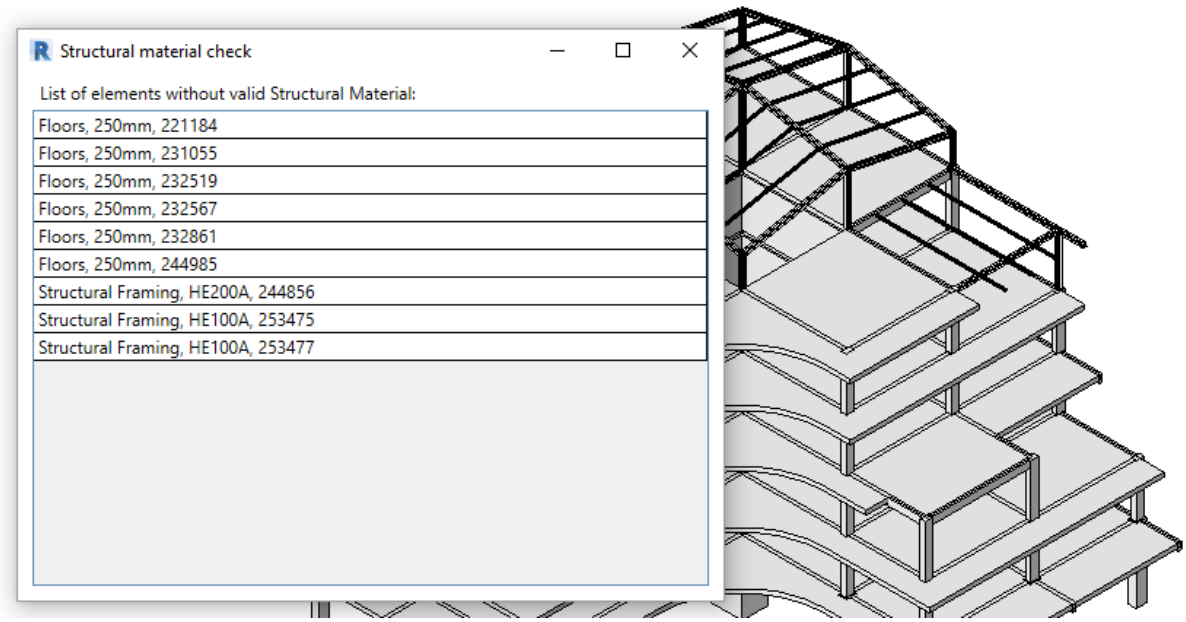
- Select one, more elements (with Ctrl button), or all elements (Ctrl + A) and press *Enable Analytical Model* in order to enable the analytical model in the selected objects. If the analytical model is enabled in all elements, the dialog becomes empty.



In case of larger number of elements without the analytical model, it is recommended to enable it partially to a smaller number of objects at a time, rather than enabling it all at once. It requires smaller regeneration of the Revit model and will speed the process up.

2. Material

Click on *Material* tool in order to check if all structural objects in your model have valid structural material. *Structural material check* dialog will appear with a list of all objects without valid structural material, as shown in figure below (if all structural objects in your model have valid structural material, the list will be empty).



This tool gives you the following options (partially similar to *Analytical Model* tool):

- Double click on one element to highlight it in the model.
- Select one, more elements (with Ctrl button), or all elements (Ctrl + A) and right click, chose *Isolate selected* to isolate them in a view. Close the *Structural material check* dialog in order to modify the objects (e.g. add the structural material) in the *Temporary Hide/Isolate* view. To close the view click on *Reset Temporary Hide/Isolate.*

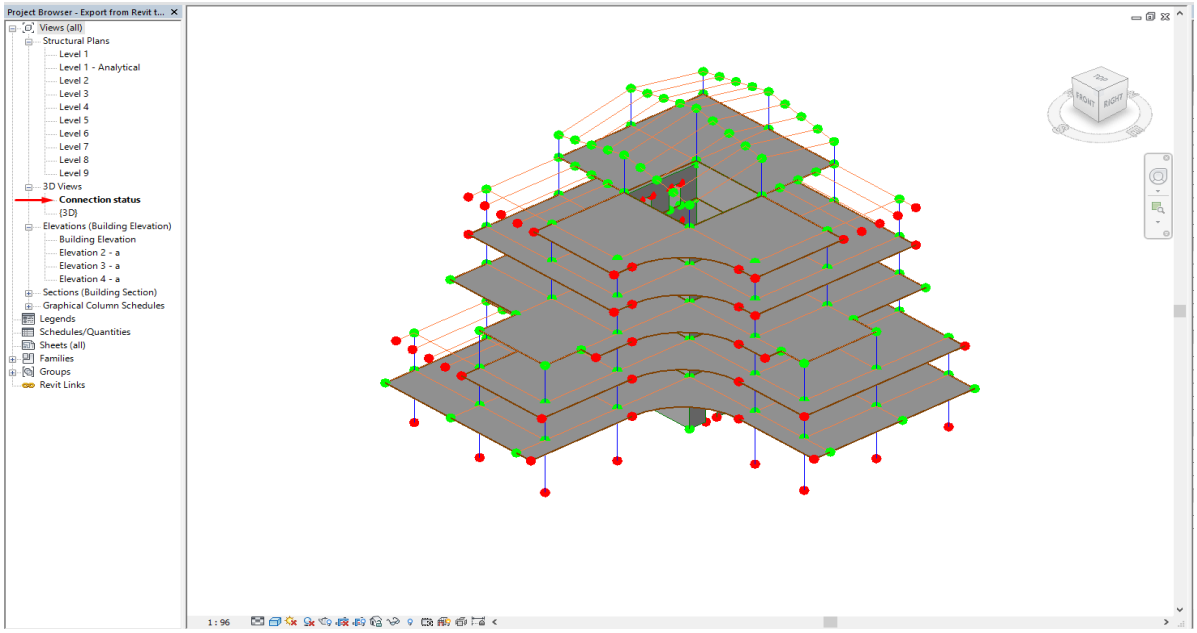
3. Connection status

Click on *Connection Status* tool in order to create a view called *Connection Status* that will display the analytical model including analytical nodes that are filtered by their connection status (green node – connected, red node – unconnected).

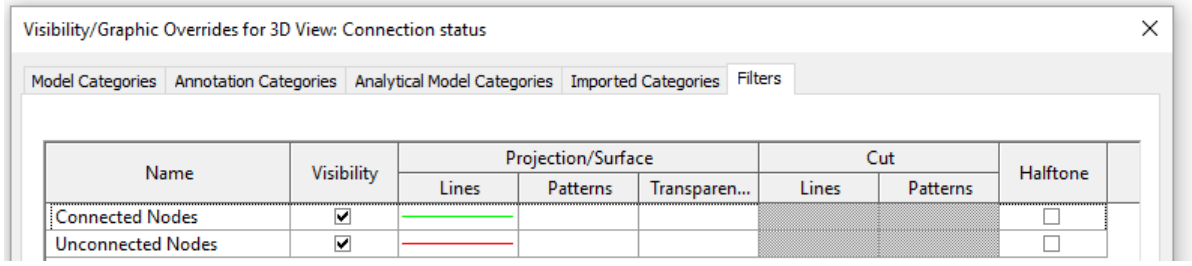
The view is created as a copy of the current view, so if the displayed view is a 3D model view, a new 3D view of Connection Status will be created. Respectively, if a current view is Structural Plan, then a new structural plan showing the connection status will be created.

If a current view has some view template applied, it may influence creation of the Connection Status view. **It is therefore, recommended to open a default 3D to create a Connection Status view.**

The view shows all available analytical objects (excluding the analytical links, boundary conditions and loads).



Two filters are applied to that view in order to distinguish between the connected and unconnected nodes.

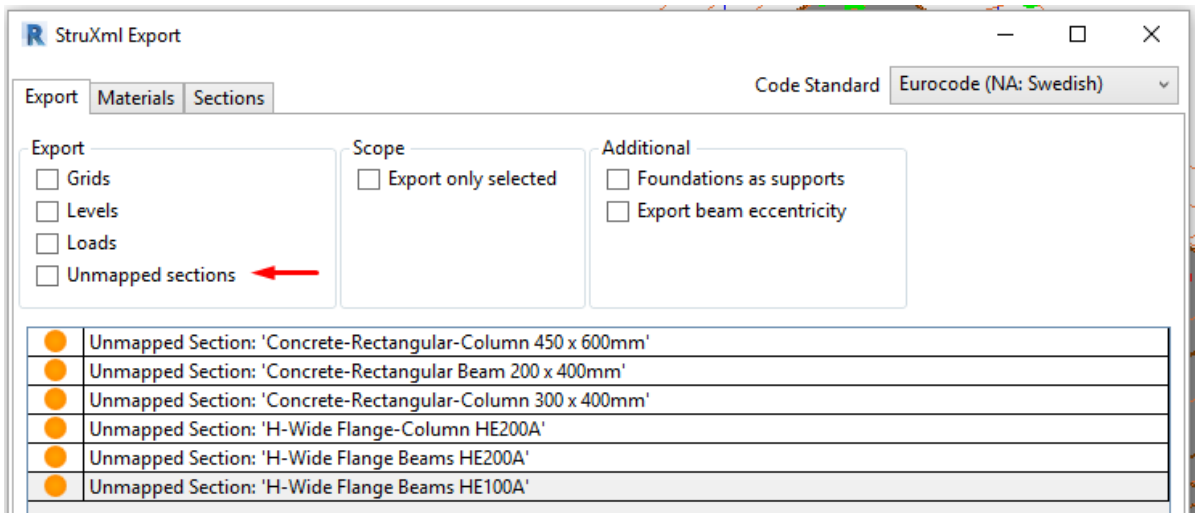


Export unmapped sections

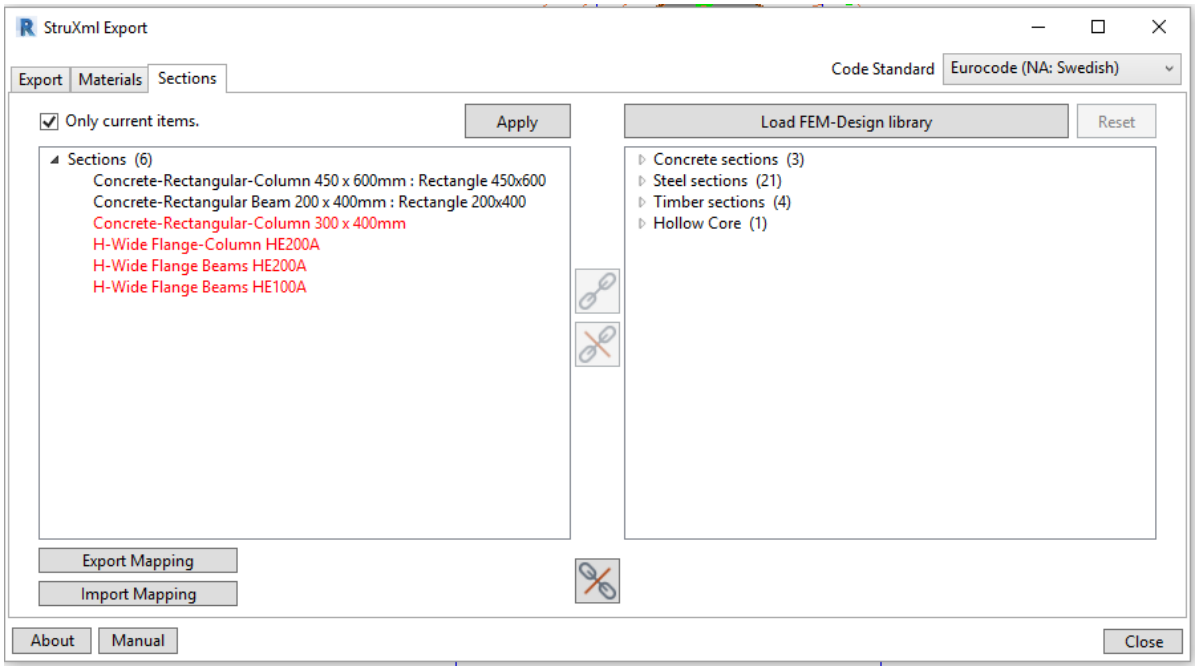
A new option has been introduced in the StruXML Export that allows for exporting unmapped section.

In previous versions of the StruXml StruSoft Add-In, both all the materials and sections had to be mapped to corresponding objects from FEM-Design library, otherwise elements with unmapped material or section were not exported.

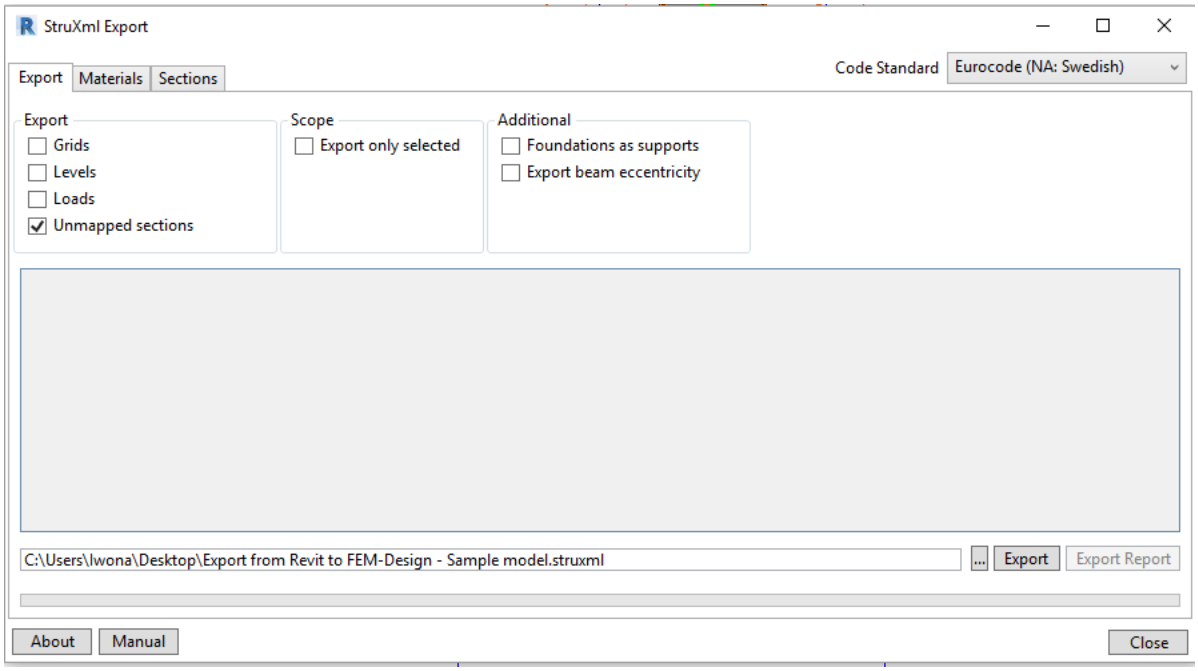
From now on, it is possible not to map the sections (the materials still have to be mapped) and let the StruXML StruSoft Add-In create them automatically in FEM-Design.



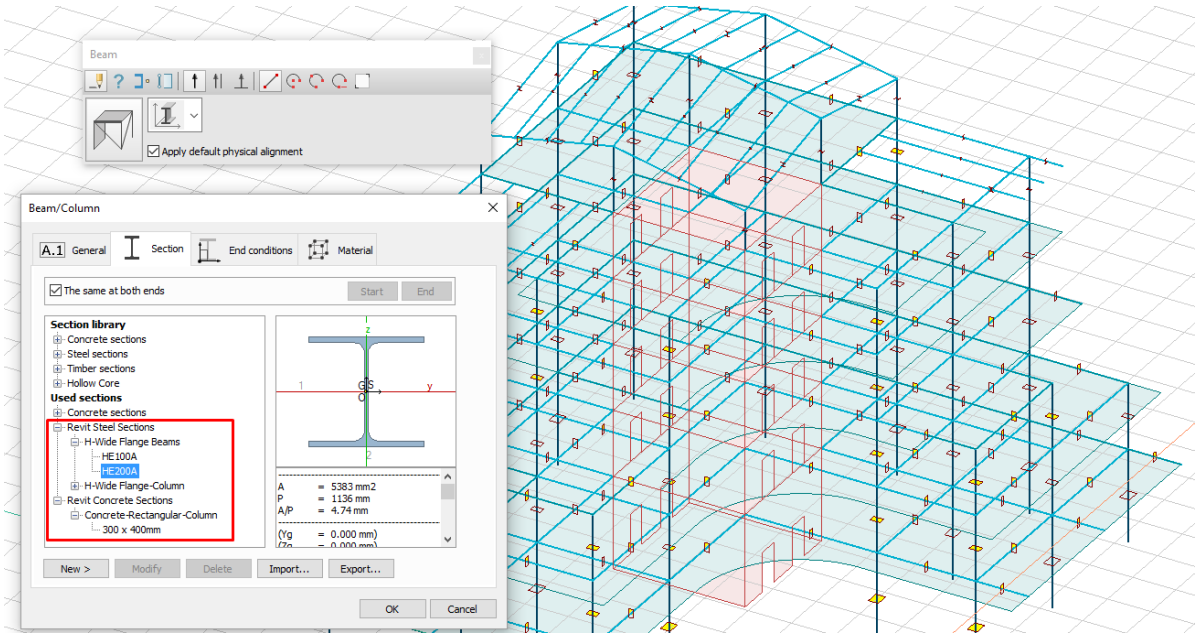
It is possible not to map any section, or map only some sections, and let the Add-In create the rest, as shown in the example below.



In the Export tab, simply chose to Export unmapped sections (when this option is chosen, the list of warnings about unmapped sections will disappear).

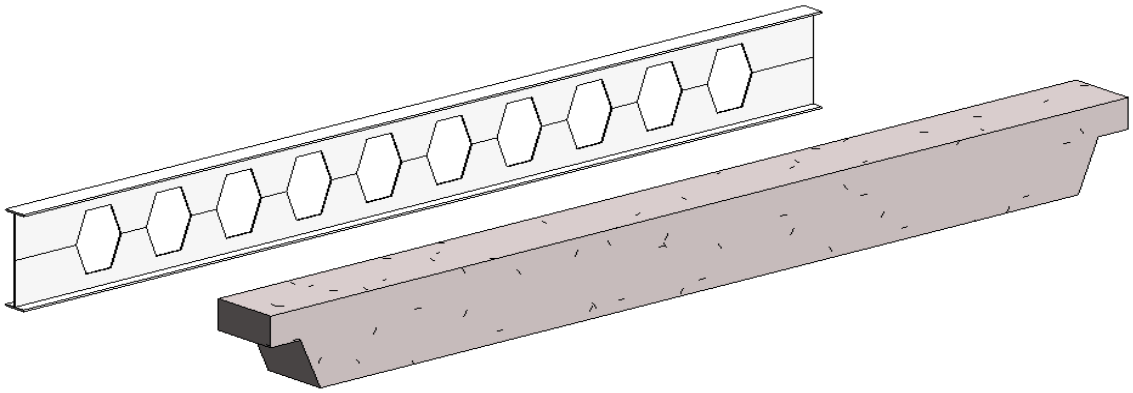


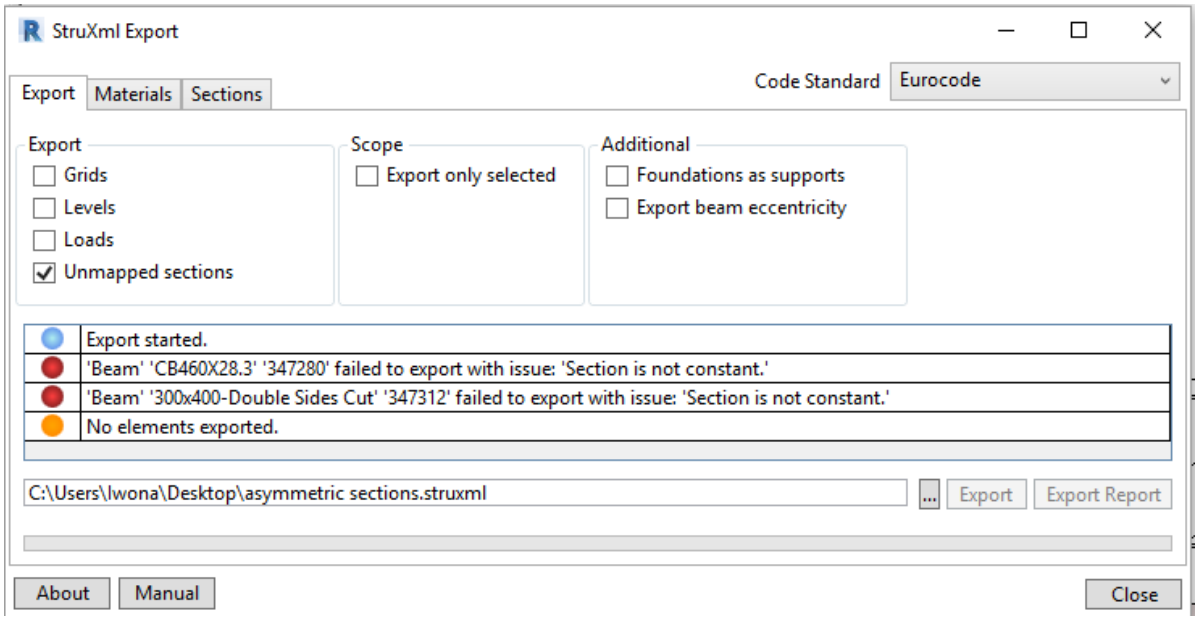
In FEM-Design, the unmapped Revit sections are listed under Used sections, and are named as the sections in Revit.



Keep in mind that if you choose to export unmapped sections, new sections will be created in FEM-Design, even though similar sections exist in FEM-Design library. If you want your Revit object to have the original FEM-Design sections, use the regular mapping procedure.

In case of an attempt of export unmapped sections that do not have a constant section (examples shown below) the Add-In will send a warning that such section cannot be exported (since it cannot originally exist in FEM-Design).





Limitation and recognized issues

Structural material given to adjacent object

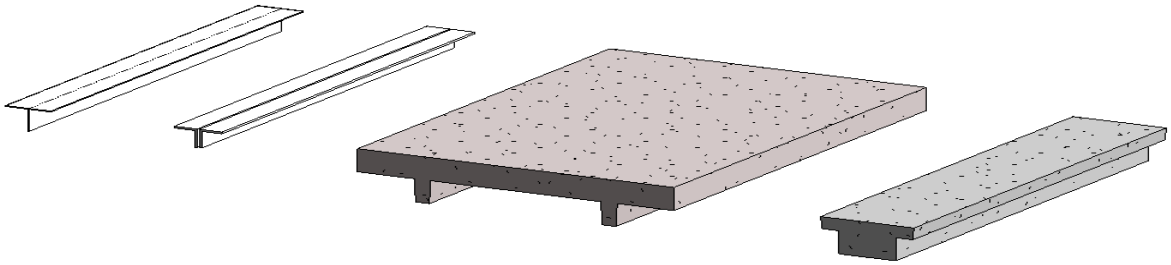
If a single linear object (beam, columns) does not have a valid structural material (is set to <By Category>), it cannot be exported due to lack of material. Also the Structural material search tool will recognize it as object without a valid material.

But, in some situations when this linear object is connected (in a certain way) to another object e.g. floor that has a valid structural material, Revit will by default apply this material to our linear object. This is however, not clear from the user interface – our object's material will still be set to <By Category>. In such case, the linear object will not be recognized as one without a material and will be exported with the material given by the adjacent object.

It is not known to us what the exact situations are and when the adjacent object's material will be given by Revit to a connected object without a material.

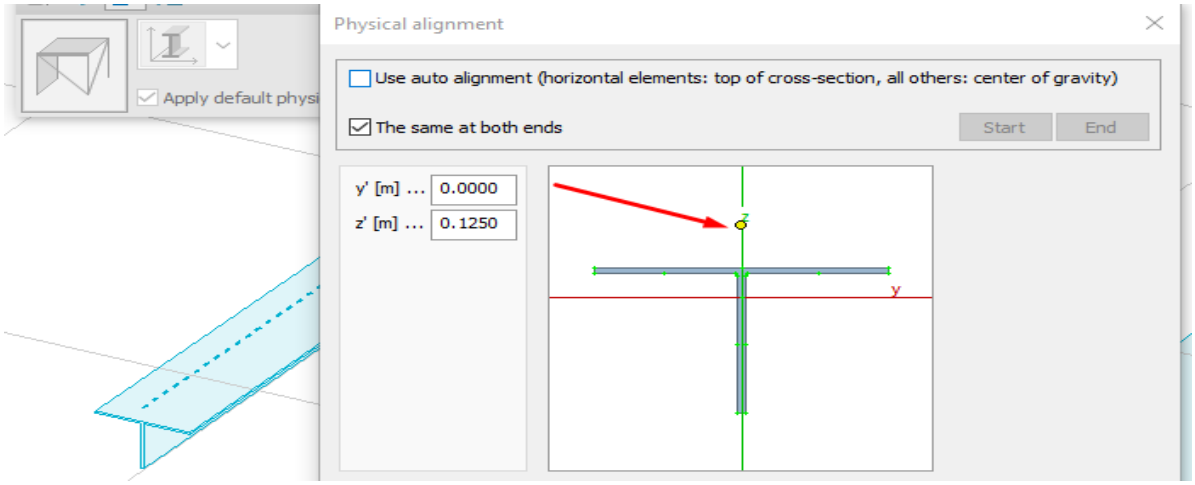
Eccentricity issues in export of (some) mono-symmetric beam profiles

Some of mono-symmetric sections families in Revit (examples shown below) often have a reference line defined in the middle of section height, which is not a center of gravity of that section.



When such section is exported to FEM-Design with the option to export beams eccentricity, the center of the gravity is applied correctly, but the eccentricity settings (how a physical section is located in relation to the beam's analytical model) is not read correctly due to the difference between Revit and FEM-Design's approach.

Example of such is shown in figure below. The physical eccentricity should be set to top, but instead is placed outside it the section.

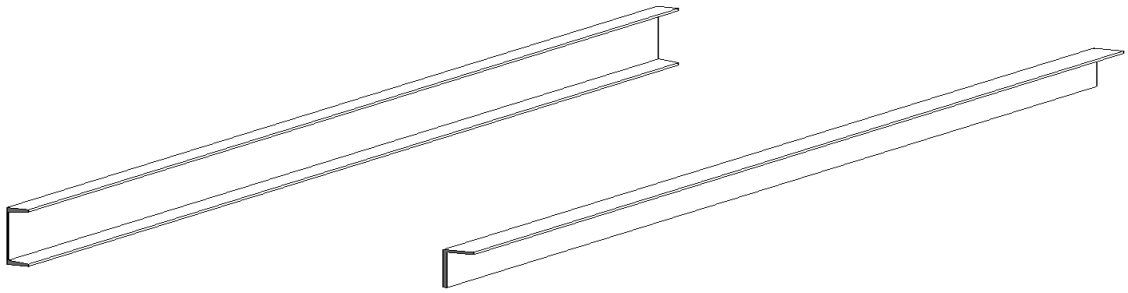


The solution is to:

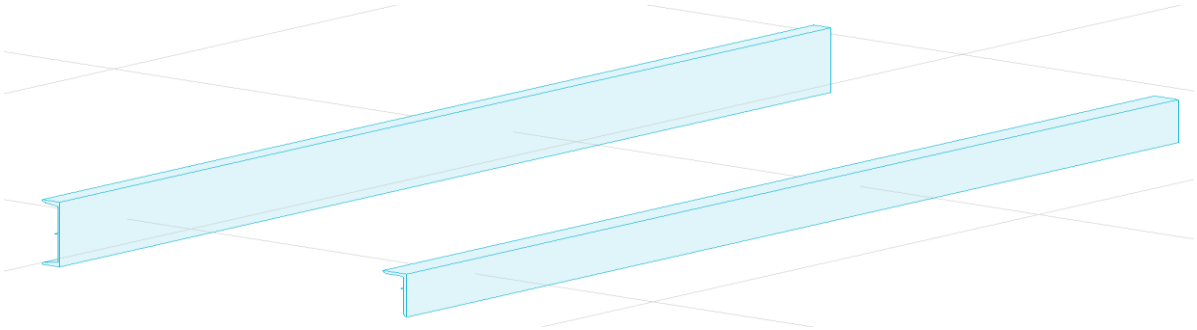
- adjust the physical eccentricity manually in FEM-Design,
- or do not export beam's eccentricity - in such case the physical eccentricity in FEM-Design will be applied to center of gravity of a section). This is the default option in export settings.

Mirrored section in export of asymmetric and (some) mono-symmetric beam profiles

Example of asymmetric and mono-symmetric beam profiles in Revit:

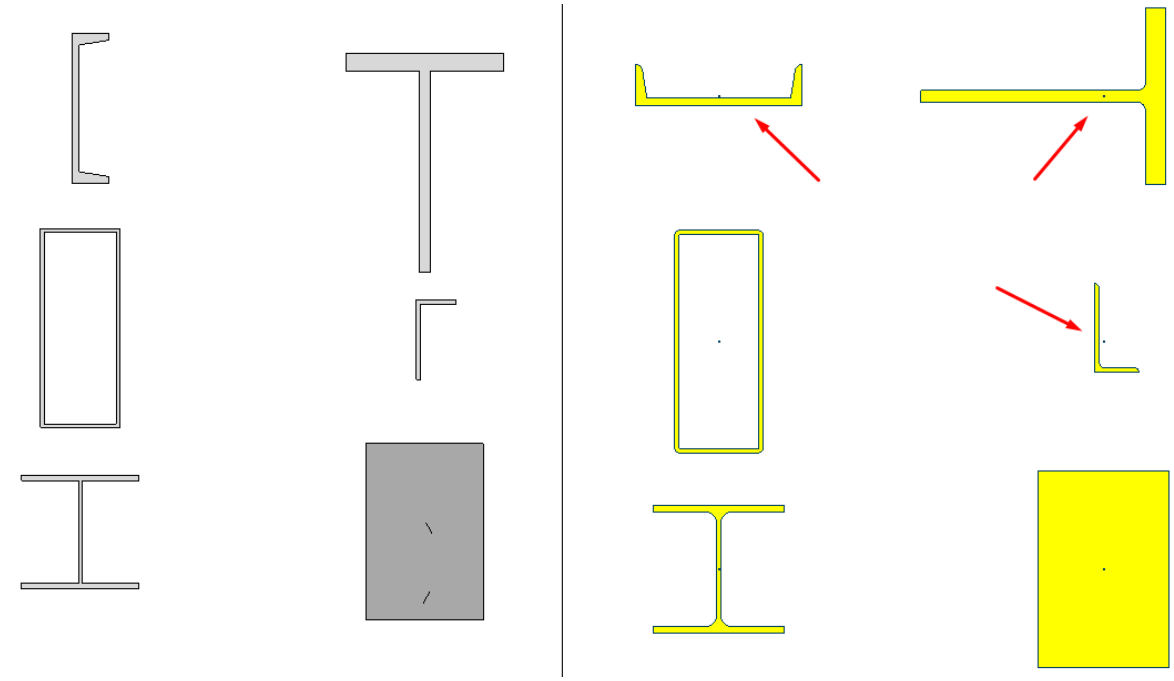


This is how these sections will looks like after importing them to FEM-Design: the sections are mirrored.



Rotation problem in export of asymmetric and (some) mono-symmetric column profiles

Example of different column profiles in Revit and the result of exporting unmapped sections to FEM-Design. As visible, the asymmetric and mono-symmetric profiles are not exported with the correct rotation.



At the moment we are not able to solve any of the issue, but we will do our best to provide some solution in one of the coming Add-In releases.