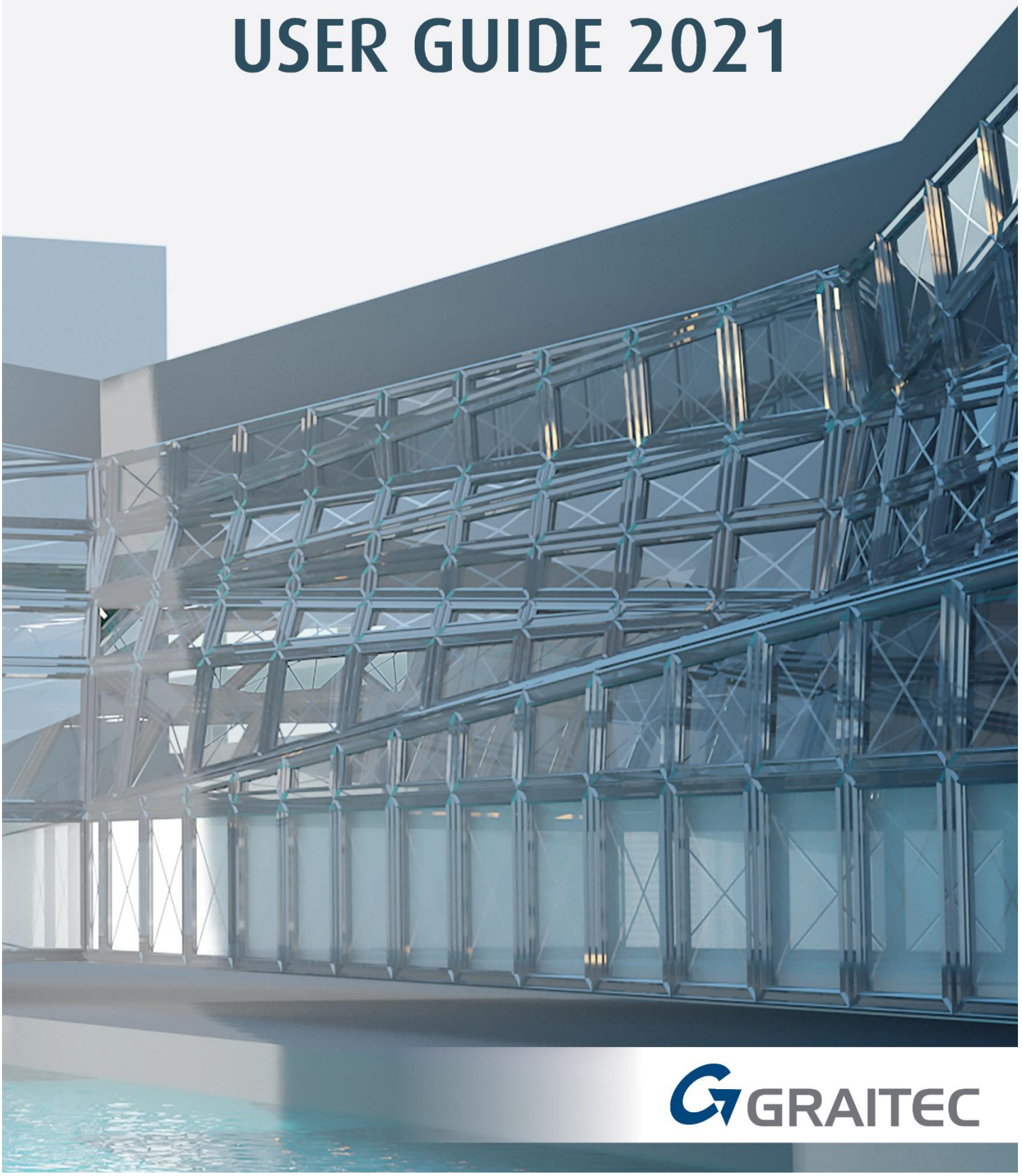
ADVANCE POWERPACK for Autodesk® Revit®

USER GUIDE 2021



GRAITEC

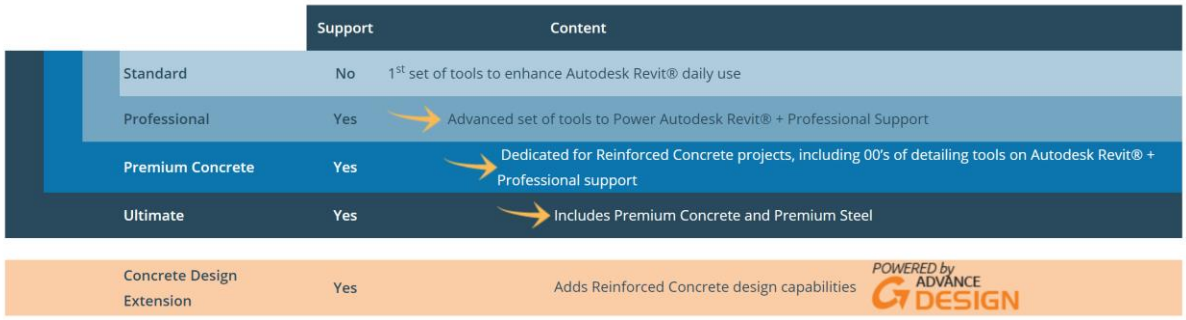
Contents

1 Introduction

Advance PowerPack is a set of add-ons for Autodesk Revit®, Autodesk Advance Steel®, Autodesk Inventor®, and Autodesk Vault® helping users to accelerate model creation, save clicks, better control their models, extend BIM workflows and of course comply with the latest Autodesk versions.

Advance PowerPack for AEC Collection is structured into 4 packages:

1. **Standard:** Productivity tools for enhancing Autodesk Revit daily use
2. **Professional:** An advanced set of tools maximising the effectiveness of Autodesk Revit or Advance Steel. The professional package also includes a dedicated Gold support contract
3. **Premium:** A dedicated version that is discipline specific. From Release 2021. 2 premium packages are available addressing either rebar detailers or steel detailers. The premium package also includes the dedicated Gold support contract
4. **Ultimate:** This package is dedicated to companies using all Autodesk solutions together, it includes all previous packages with tools running on Autodesk Revit and Autodesk Advance Steel as well.



Note: this document covers the functionality in Standard and Professional only. For more detail around what tools sits in which version please go to: Revit PowerPack Tools Matrix which will outline each tool and in what version they are available.

1.1 System Requirements

Revit PowerPack requires Revit to be installed on the PC. PowerPack will support Standalone and Network versions of Revit. They may also for part of a suite such as Building Design Suite Premium (BDSP). Listed below are the variants of Revit that are currently supported.

Supported Revit Versions

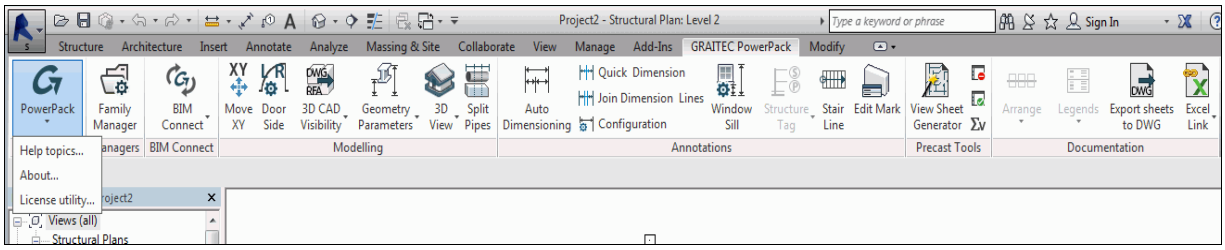
- Revit 2020 / 2021
- Revit – AEC Collections 2020 / 2021

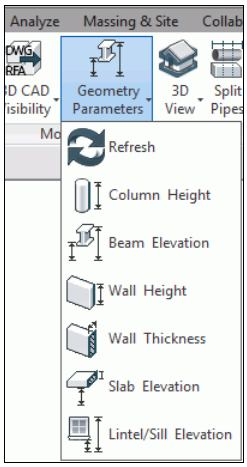
***Note**:* *Revit LT is not supported.*

Previous versions of Revit are not supported. Hardware requirements are as per Revit/AEC Collection. Please refer to the Autodesk Hardware Requirements webpage: http://knowledge.autodesk.com/support/revit-products/troubleshooting/caas/sfdcarticles/sfdcarticles/System-requirements-for-Autodesk-Revit-products.html

2 Graitec PowerPack Ribbon

Once successfully installed, the Graitec PowerPack Ribbon will appear next to Add-Ins. This will be the location for all PowerPack tools. Panels can be moved to make navigation easier





Some of the panels will have dropdown arrows, which will expand to access additional commands

2.1 Ribbon Customisation

Graitec PowerPack Ribbon presents the user with a large variety of new powerful functionalities for better control and automation while working in Revit.

Due to the great number of developments provided in each version a tool for managing and organising the workflow helps to manage this better.

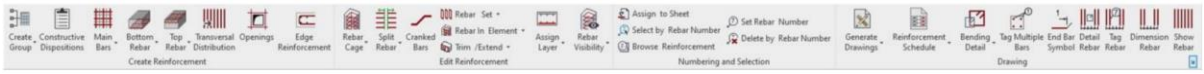
Using the Ribbon Customisation command, customers can decide on and select the commands they would like to be available in the PowerPack

To make it easier to find commands typical for different Graitec PowerPack for Revit 2021 package configurations, changes have been made to the distribution of commands available on the PowerPack Ribbons. There are 3 Ribbons that are available, these are:

- PowerPack
- PowerPack Detailing
- PowerPack Design

On the **PowerPack** ribbon, users can find all commands available so far on the Graitec PowerPack Ribbon with new options including the Ribbon Manager:

On the **PowerPack Detailing** ribbon, users can find commands to quickly create 3D rebar cages, commands to facilitate the work with the reinforcement and commands to simplify the creation of drawing documentation.

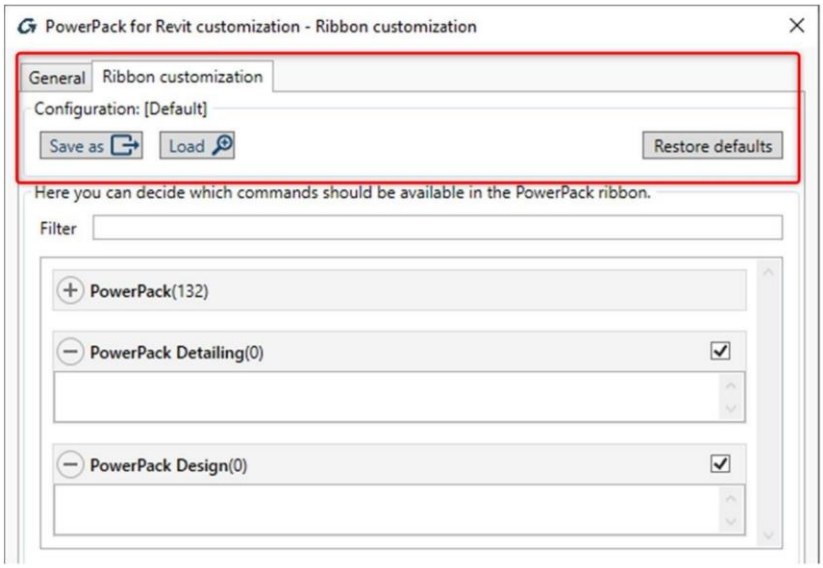


On the **PowerPack Design** ribbon, users can find commands for designing rebar cages according to international design codes, including commands: for managing project, for assigning calculation settings, for running analysis, for checking results and for preparing documentation.

Note: *These ribbons are current to 2021 version only. If you need information on previous versions, please contact Graitec and we will provide you with older guides.*

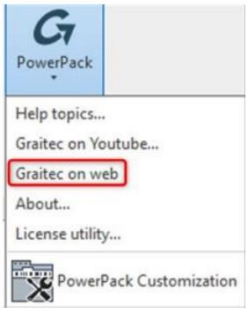
2.2 Saving and Loading Ribbon Configurations

Graitec Ribbon Customisation tool allow Revit user to show/hide features in the Revit Ribbon. This configuration can now be saved in a *.xml file. Thus, it could be possible to load it, on another computer for example to standardize the Ribbon configuration by making visible only the favourites tools wanted by a user.

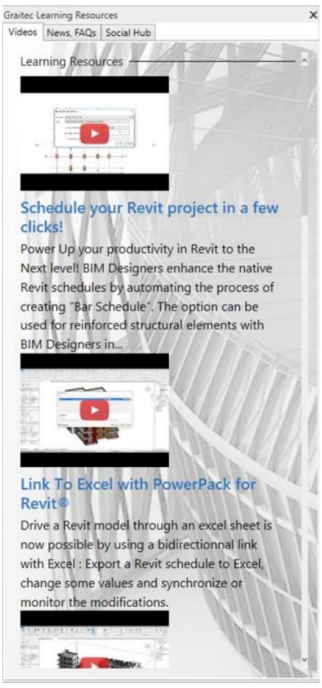


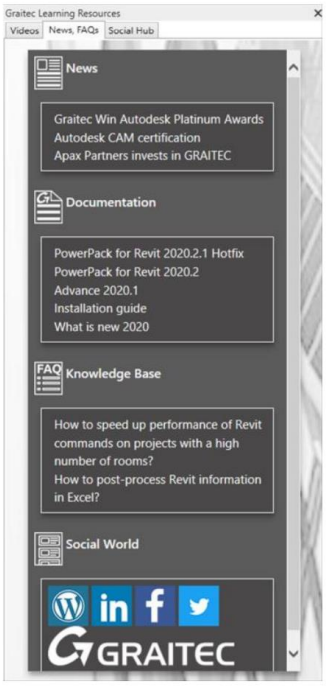
2.3 Graitec Learning from start page

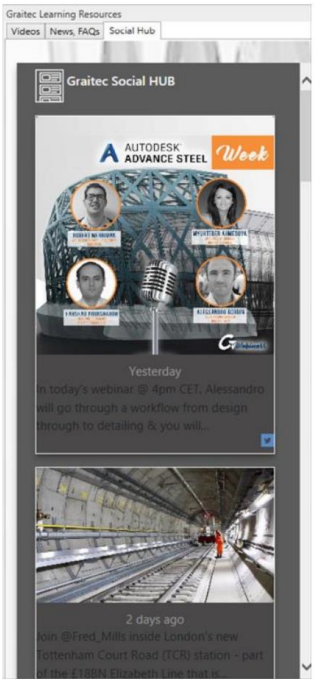
This version proposes a dedicated panel to quickly access Videos, News, FAQs and Social Hub. This panel can be found in the general dialog box for the option.



The panel is composed of three different tabs giving access directly to web content and web information.

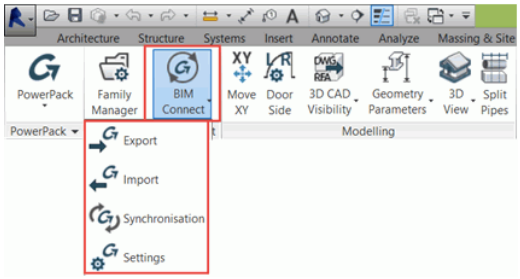






3 BIM Connect Tools

The BIM Connect is included in PowerPack 2016 and onwards for Revit. This tools will allow the user to connect to Graitec Advanced Design, allowing the workflow between products to be much more fluid. This will include family recognition and the ability to bi-directionally synchronsise the design to the model.

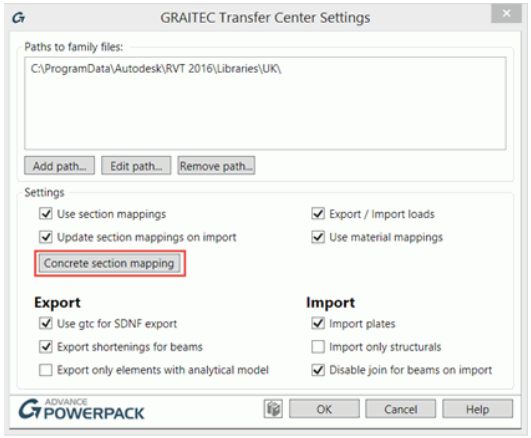


The Ribbon has a section called BIM Connect, inside this button there is the ability to undertake the following:

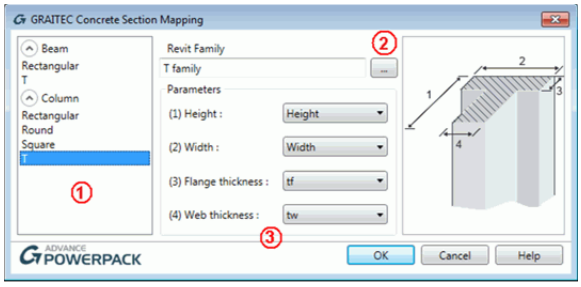
- Export
- Import
- Synchronise
- Edit Settings

3.1 Concrete Section Mapping

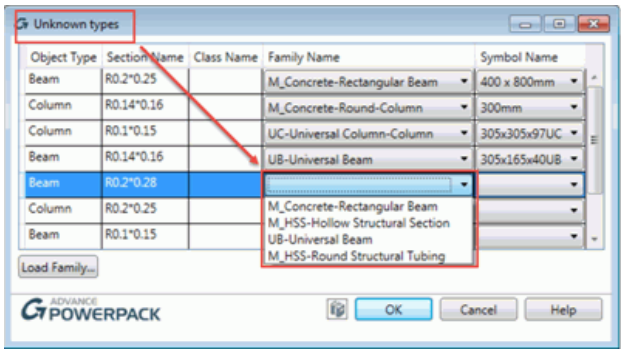
The Concrete Section Mapping option is available under **Settings**



Once **Concrete Section Mapping** is selected, the user is presented with a new dialog box

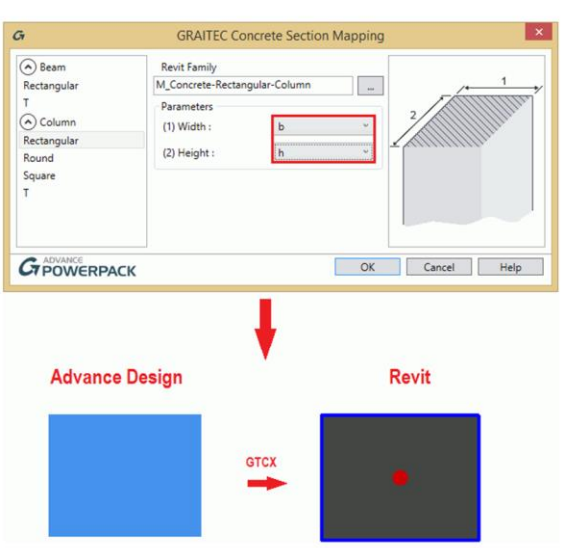


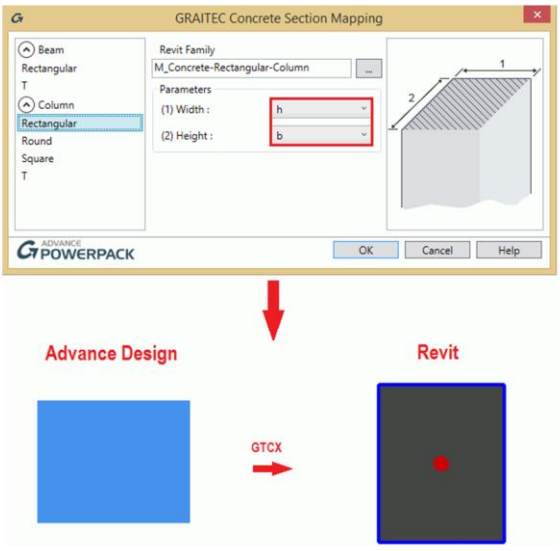
The user will have the ability to select the parametric section type, and map this with a Revit family type. This will then allow the user to match the parameters between the two families.



Note: The mapping of concrete sections must be done before importing the model. If a model is imported prior to mapping, then the user will be presented with an error 'Unknown Type'

If the information is incorrectly mapped, the import will also be incorrect.

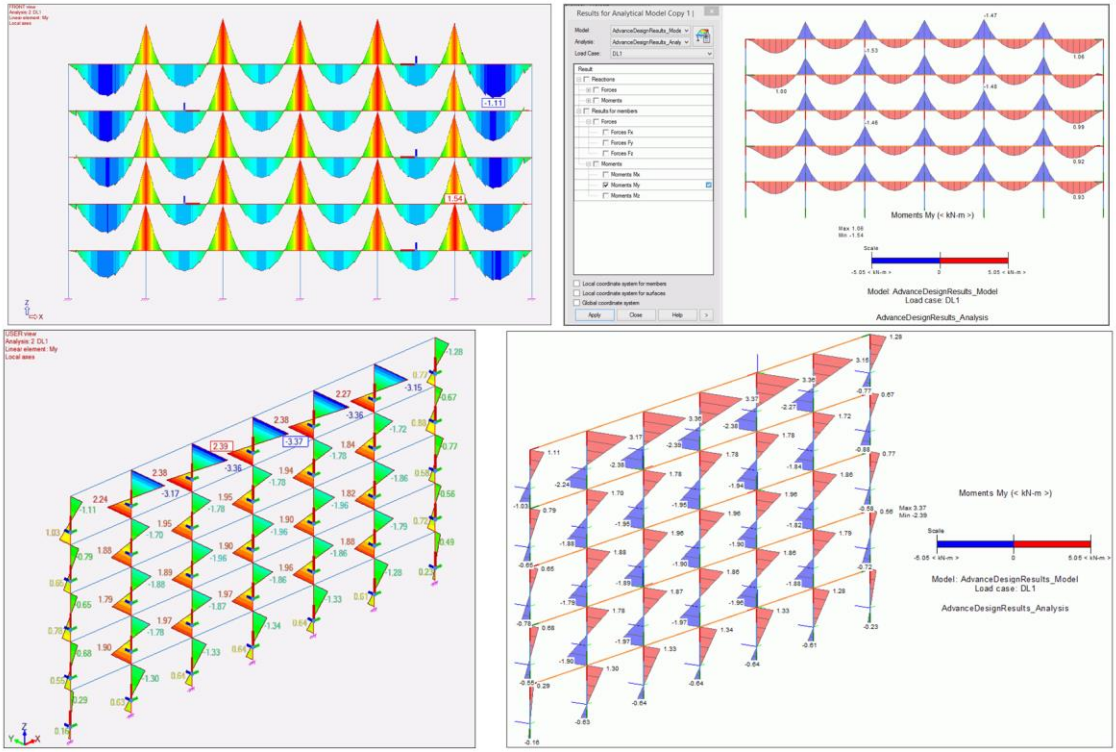




3.2 Importing of FEM Results for Linear Elements

Through the GTCX format, BIM Connect can import FEM results for linear elements from Advanced Design load cases.

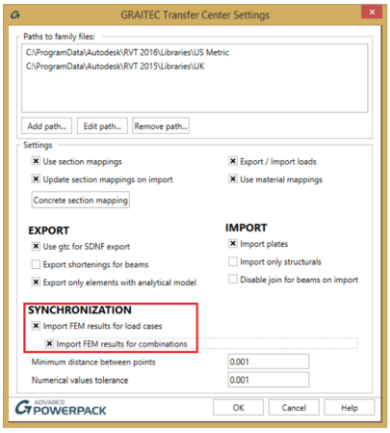
After importing the results into Revit, they can be managed using Revit Results Explorer.

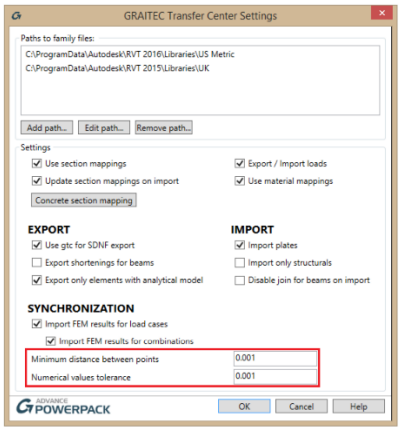


Note: Revit Results Explorer installs with Advance Design and is not part of the standard Revit installation.

3.3 Import FEM Results at Synchronisation

This option will offer the possibility to import FEM results when the model is synchronised. Therefore, it is no longer necessary to import the full model to get the FEM results from load cases and load combinations.





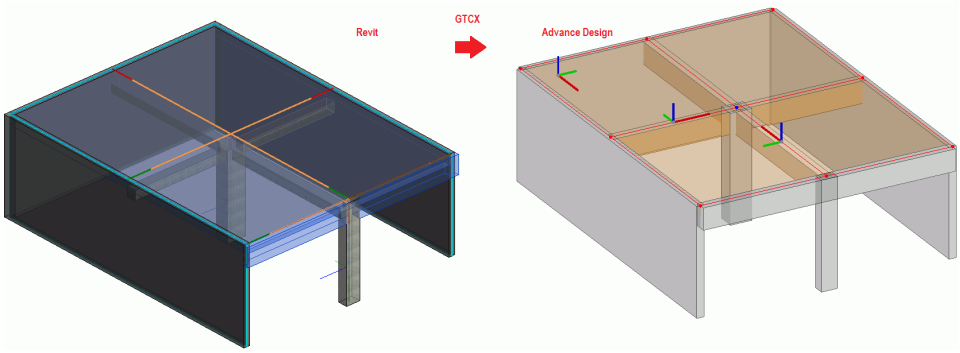
The two options set the precision considered when synchronising two models.

The geometrical points will be compared up to the number of decimals selected by the user in the **Minimum distance between points** field. Any other numerical value, for example, load intensity, will be compared up to the number of decimals set in the **Numerical values tolerance** field.

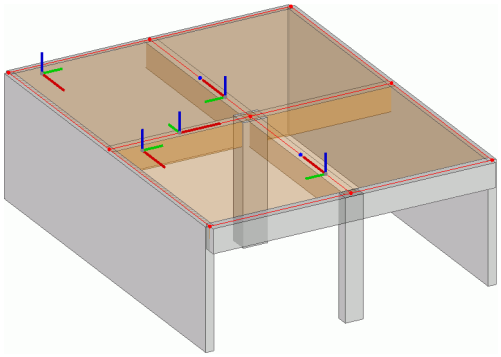
3.4 Split Elements Synchronisation

Split elements can now be synchronised.

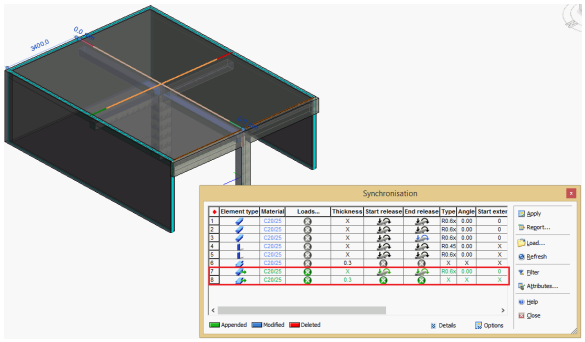
A Revit model consisting of a continuous beam and a slab which covers the entire floor can be exported in GTCX and imported in Advance Design.



The users can choose to split the continuous beam or slab:



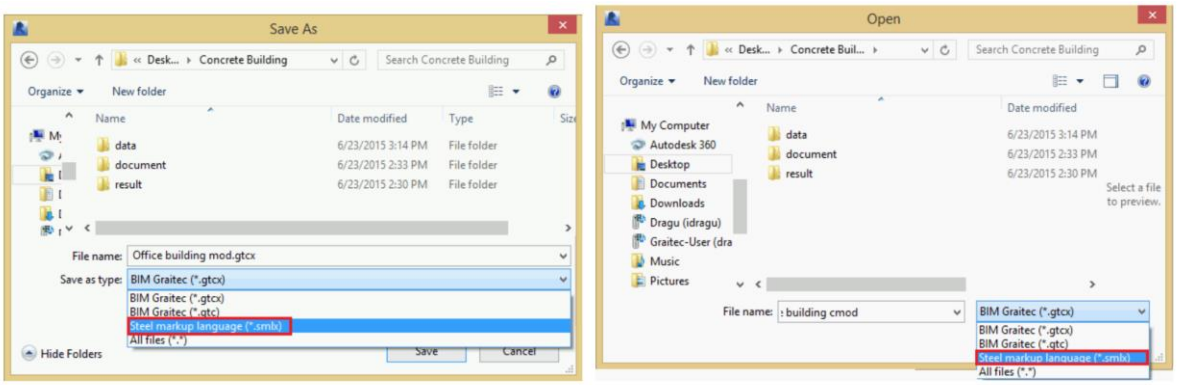
This change can be synchronised back to Revit through GTCX, therefore, the next step is to export the model from Advanced Design and load the GTCX in the sync dialog box from Revit.



Select the changes and apply them. Check the results in the Revit model.

3.5 Import/Export in Autodesk AS format – SMLX

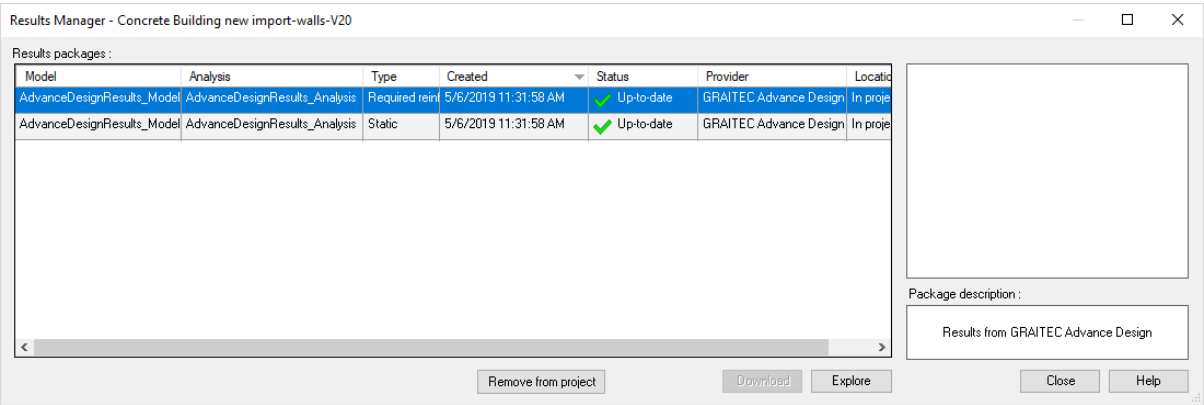
BIM Connect 2016 is compatible with the new Autodesk Advance Steel exchange format – SMLX. The Graitec exchange tool can import and export SMLX files.



3.6 Import of Theoretical Reinforcement

The BIM Connect tool can store a results package for the theoretical reinforcement coming from an FEM software for surface elements. These results are available for slabs and floors.

The results are stored in a package and visible in the Results Manager from Revit:

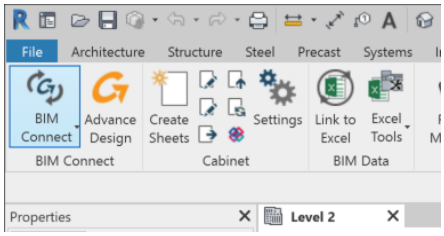


Results are available for BIM Designers through the **Import Analysis** results dialog

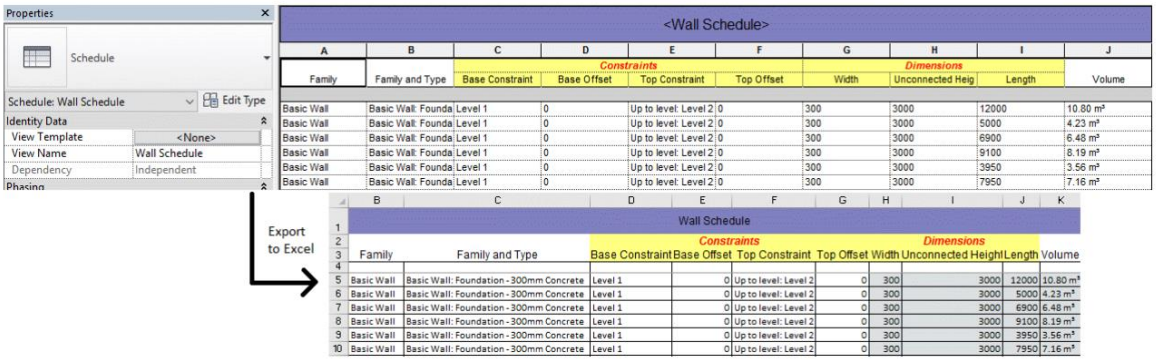
The BIM Connect tool is now able to embed resultant force values (top and bottom) for shear walls and groups of shear walls.

4 BIM Data Tools (Linking Excel)

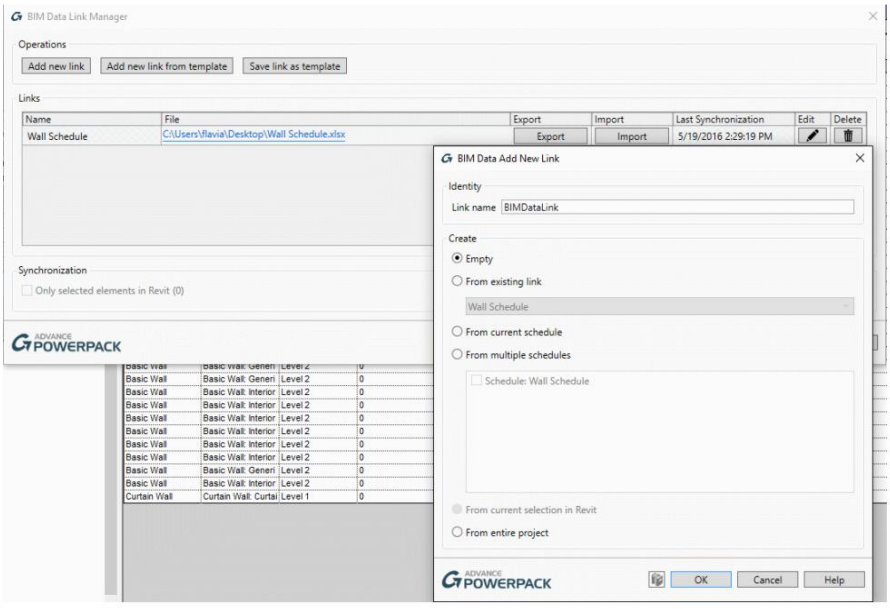
Another major advantage of the GRAITEC PowerPack for Revit® is the possibility to synchronize data using a bi-directional link between Autodesk Revit® and Microsoft Excel, through the new, powerful “Link to Excel” tool.



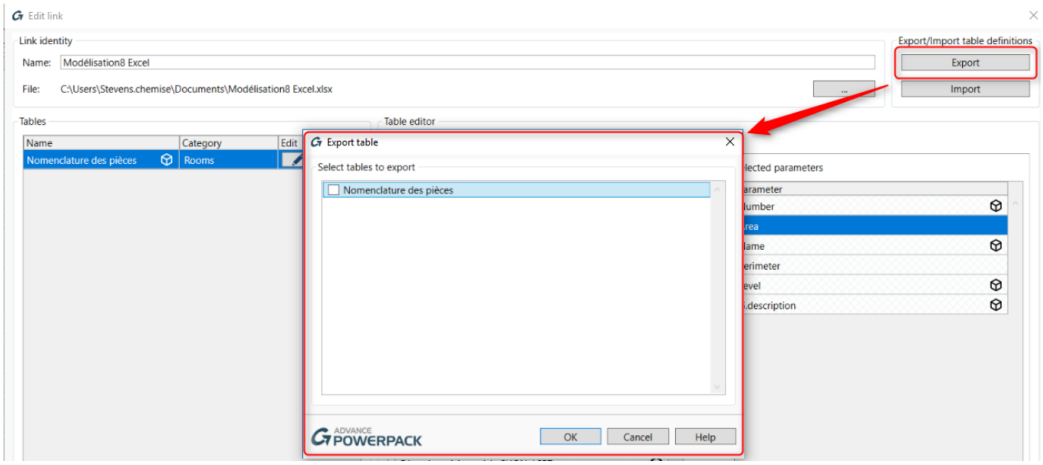
Users can export Revit schedules or compose a list of parameters to be treated as a table, in order to manage them in Excel. Once modified, the tool can import the data back into Revit and the schedules or parameter values will be updated according to the changes.



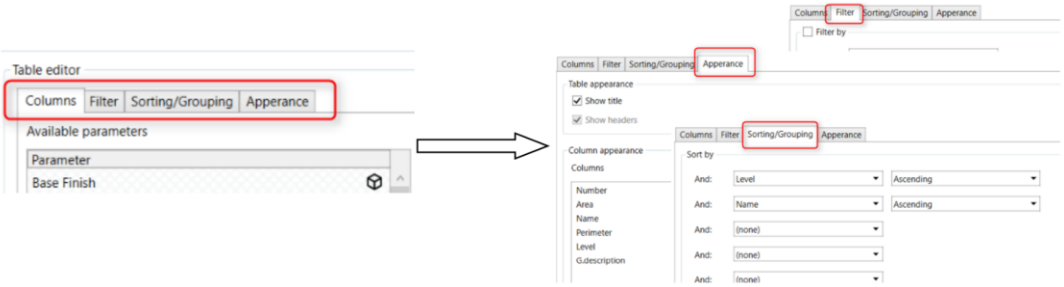
The most impressive aspect of this new tool is that it offers a powerful and strong link between the Revit project and the managing of data in Microsoft Excel. Also, the time taken to handle modifications and updates in either of the two platforms is reduced to minimum, since the process of organizing project documentation in Revit is accurately performed. There are several methods through which users can create a link between a Revit project and an Excel spreadsheet:



In addition, the user can Export/Import Table Definitions. The user can export a table layout and definition in an (*.xml) file or import a previously defined definition and use it in the project.

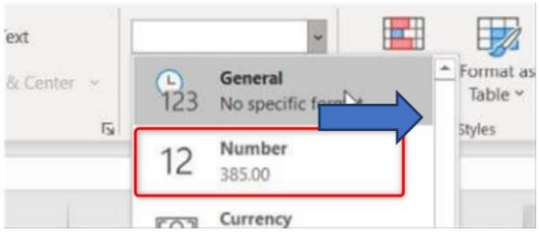


Moreover, the Table Editor now includes all major schedule properties such as Filter, Sorting/Grouping, Appearance.

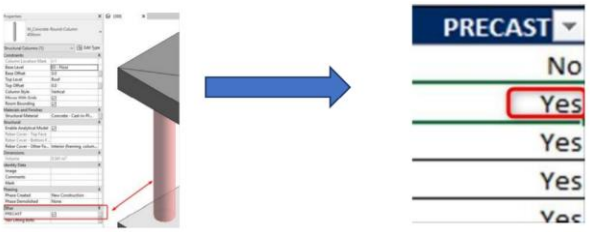


the Link to Excel command reads the cells from schedules and outputs them to their appropriate type. In the case of value, Link To excel was previously exporting data into general type cells in Excel under the Home | Number panel.

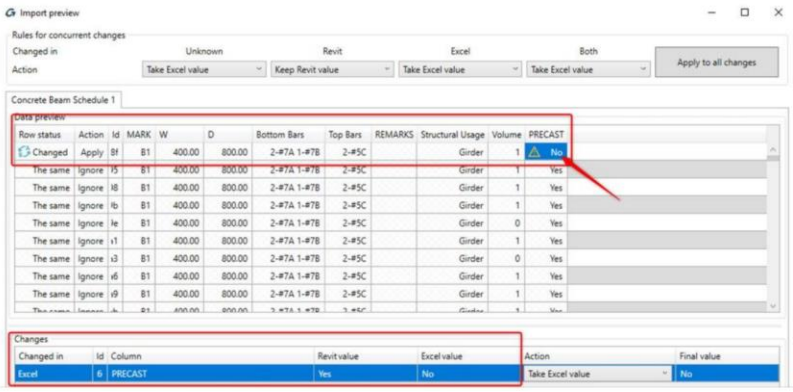
Now cells will be set as Number, enabling the possibility to make formulas, sum … more directly in Excel.



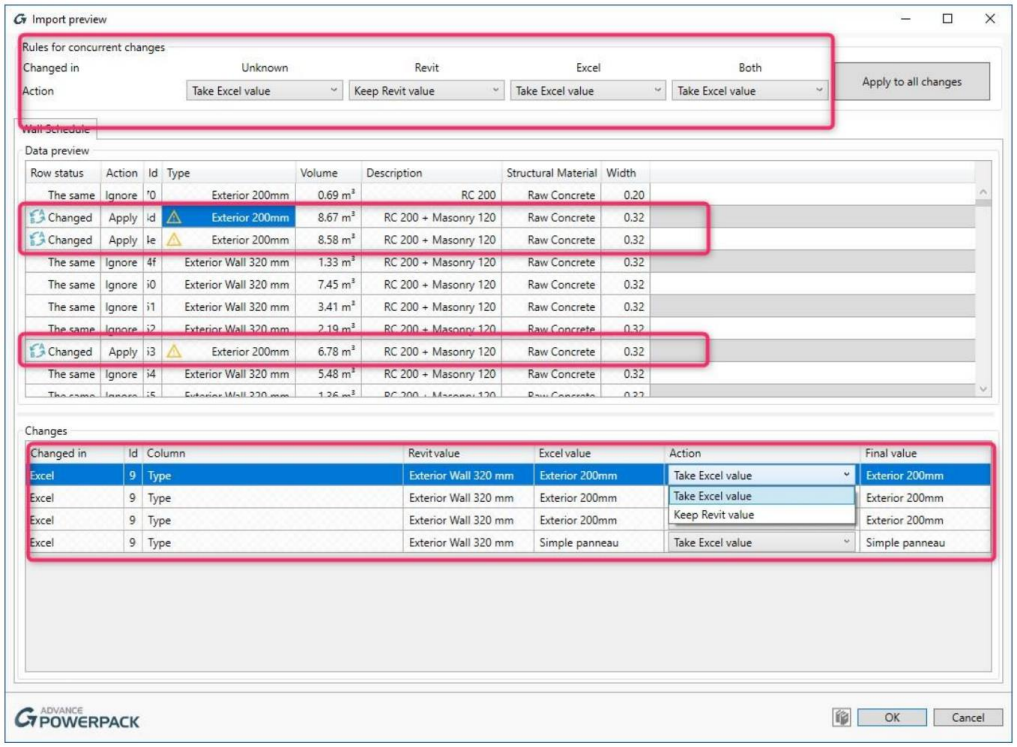
Link to Excel command now handles Yes/No type parameters. Such parameters can be exported into Excel.



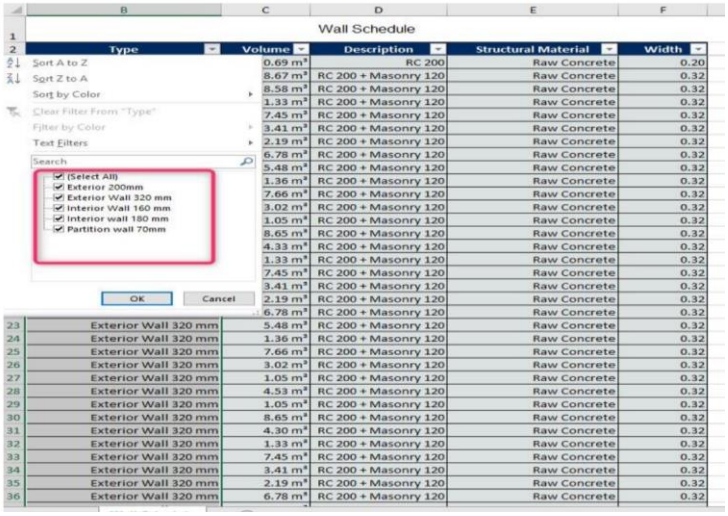
They can be imported from Excel to Revit as well and tracked with the Show Preview dialog box.



While importing an Excel file back to Revit®, make sure **Show Preview before importing back to Revit** is checked under **Synchronisation** tab. After clicking the **Import** button, the Import Preview dialog box opens with various options regarding changed data and actions to be taken (i.e. if user wants to keep changes made in Excel or keep Revit® data). In addition to this, it allows users to modify values in Revit, Excel or both, as required.

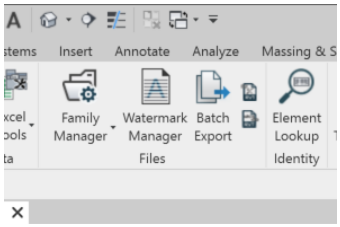


Excel Filters - This tool allows to choose visibility filters in Excel giving the possibility to filter elements by their corresponding parameter values, thus giving an opportunity to manage the Excel sheets easier.



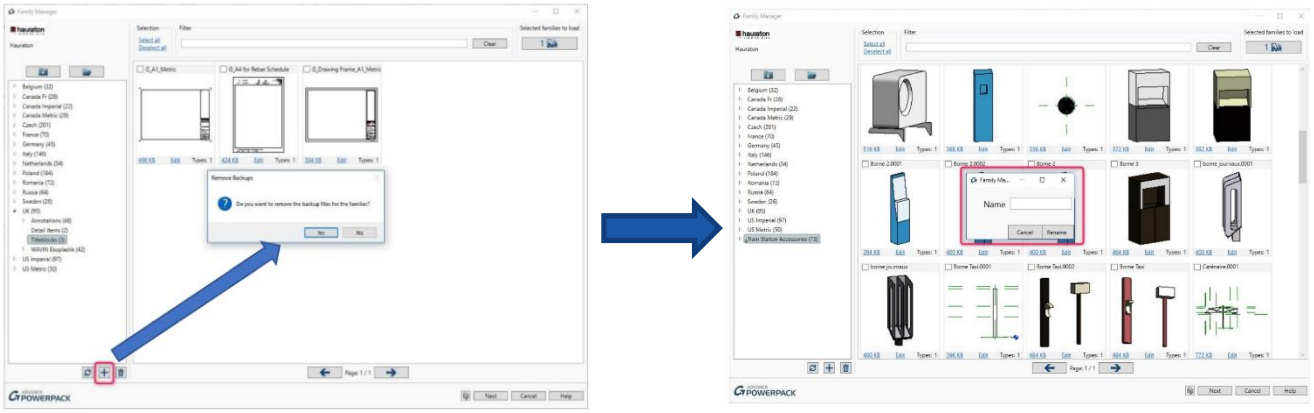
5 Files Tools

The Files Toolbar consists of 3 important tools, these are Family Manager, Watermark Manager, and Batch Export:



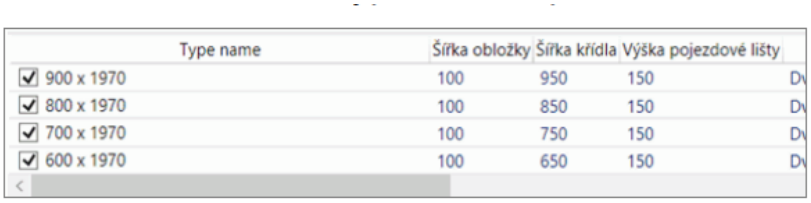
5.1 Family Manager

The Family Manager command allows the user to choose which families and their types are to be loaded into a project. The Family Manager will also allow the user to add new folders as well as accessing existing folders, so that bespoke groups of Families can be accessed/managed. Additional locations can be added by selecting the add folder (see below). The Family Manager can distinguish between Families that are currently loaded into the project and those that are not.



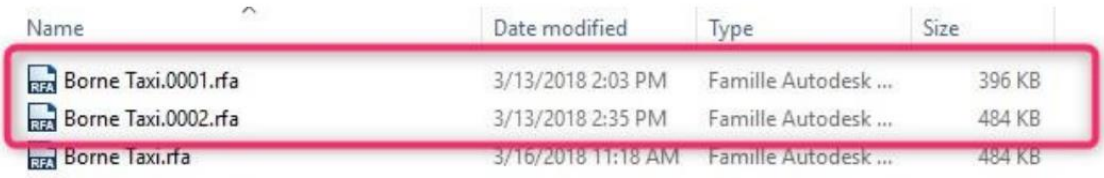
Whilst adding a new folder, users can **Remove the Backup** files from the folder and load just the relevant files. There is also the ability to rename folders using the **Rename Option**.

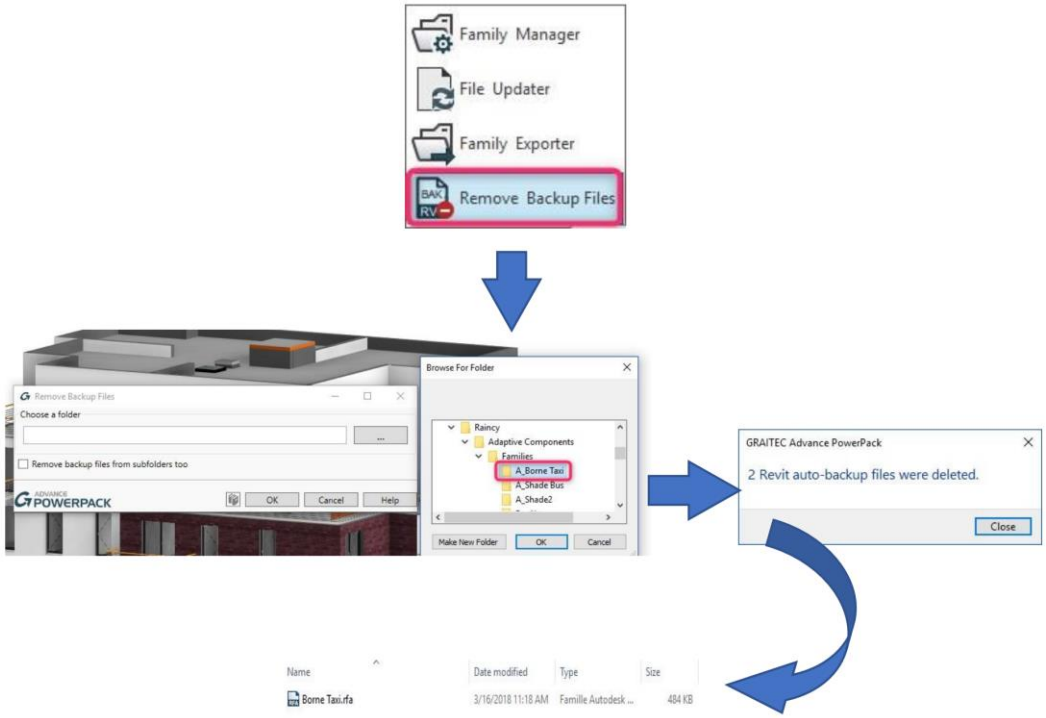
Once the Families are selected, the user will select Next. This will present the user with a window that will show all of the types from each Family. Users can then choose which types are required within the project.



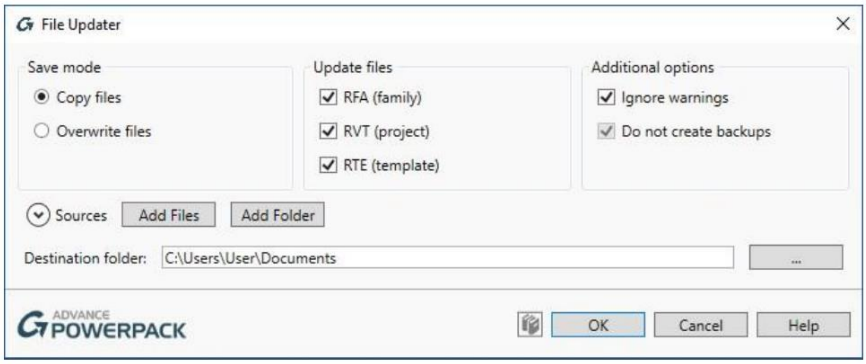
If additional Families are required, or the user needs to change the Family type, there is a **Back** button within the window. Once the user has selected the required Families, press the **OK** button to complete the load.

Remove Backup Files – Allows the users to delete backup files created by Revit from a selected folder.



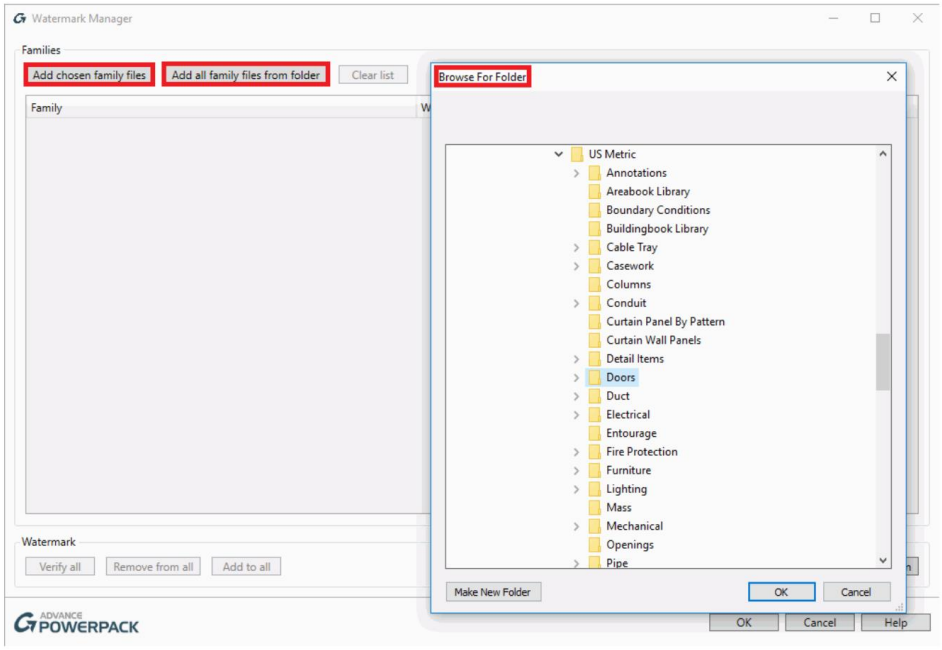


File Updater – Gives users flexibility to update the desired family file or folder.

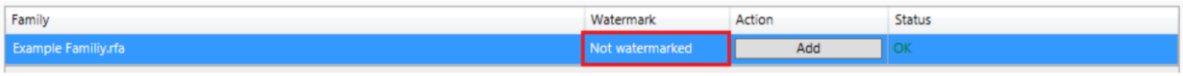


5.2 Watermark Manager

Using GRAITEC PowerPack for Revit®, users can add watermarks to all the Revit families that can be found in a folder, a process which is less time consuming than the individual selection of Revit families. User can now perform selection of the families to be watermarked either through the already existing option “Add chosen family files” or by using the new option “Add all family files from folder”.



Using the Configuration button, the user can set the information that will be assigned to the families in order for them to be identified as watermarked or not: Author, Company, URL.



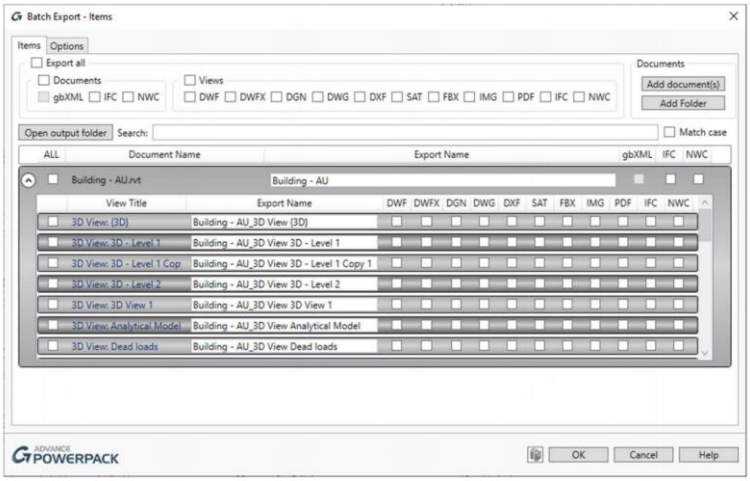
If the family turns out as No watermark, proceed and add the corresponding information to it, protecting it with a password the information is presented in the list:

5.3 Batch Export

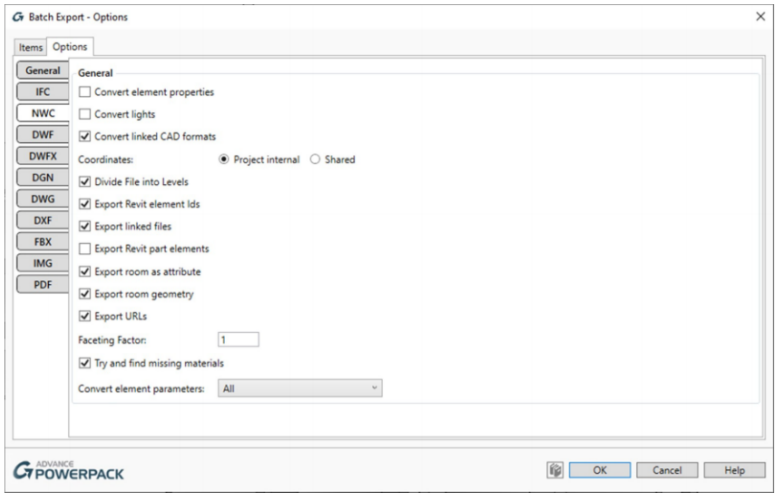
This command has the functionality to export Revit Project and Revit views into multiple target formats including:

- GBXML
- IFC
- NWC
- DWF
- DWFx
- DGN
- DWG
- DXF
- SAT
- FBX
- Images

Users will be available to select in this dialog box, multiple Revit projects and Revit views and associated the target format expected. All exported files will be generated in the output folder set.

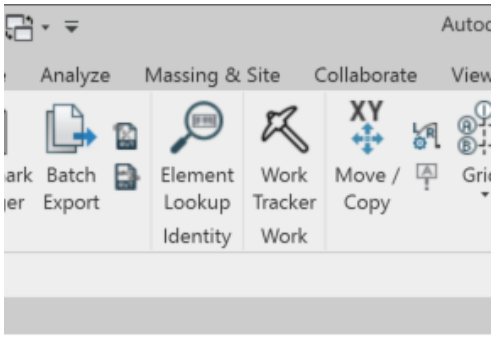


Each export file format could be customised through the options tab, to gain access to the various settings.



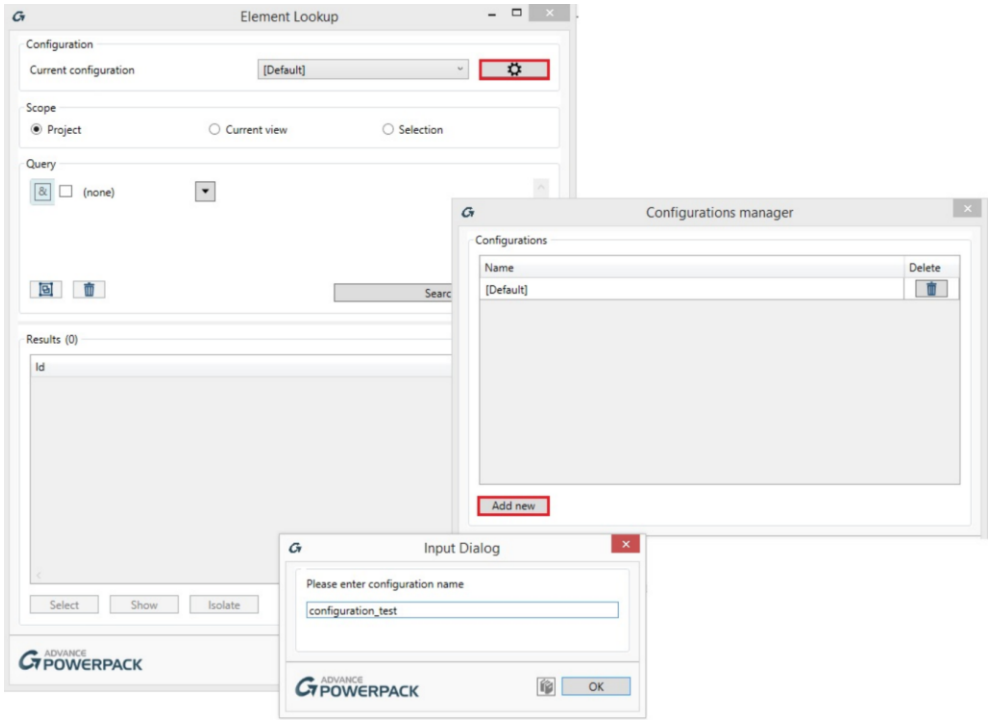
6 Identity Tool

Element Lookup is available under the Identity category part of PowerPack for Revit, and it lets the user search through the product database using a set of multiple queries from the available list of parameters.

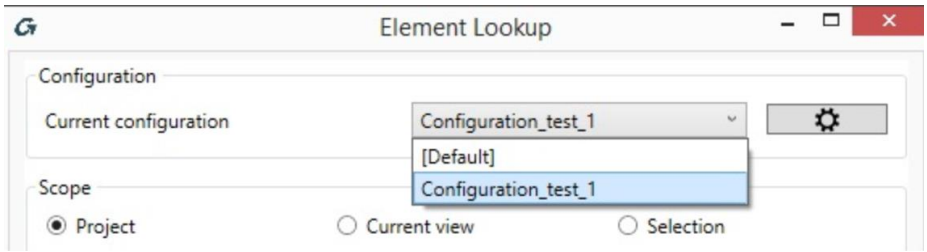


6.1 Configuration

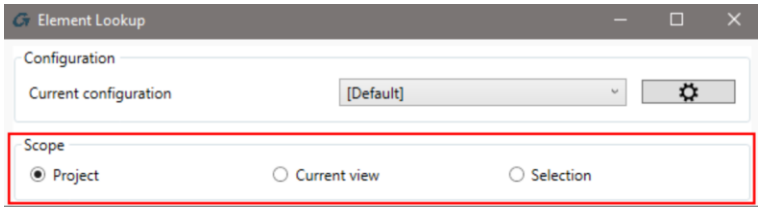
After clicking on the **Element Lookup** icon, a dialog box opens letting the user choose the **Current Configuration**, which can be set to [default] or you can choose from a list of previously saved configurations. The user can add a new configuration by pressing the Configuration Manager Button, a dialog box opens. Press **Add New** and enter the **Configuration Name**.



Select the configuration from the current configuration list and set up the list of desired queries

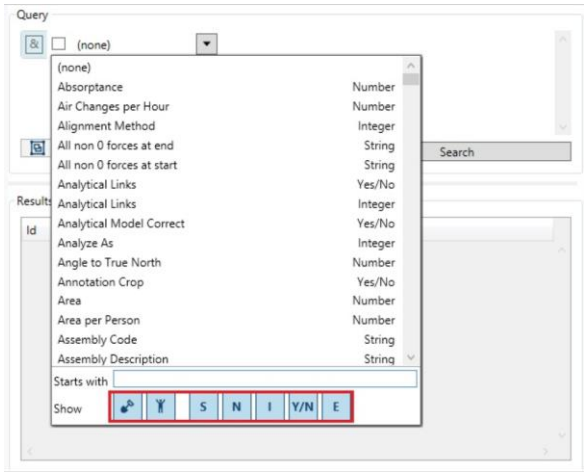


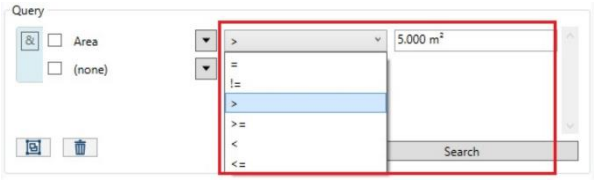
Now choose if the elements should be searched for in the entire **Project Current View** or through a previously made selection, by checking the scope radial button.



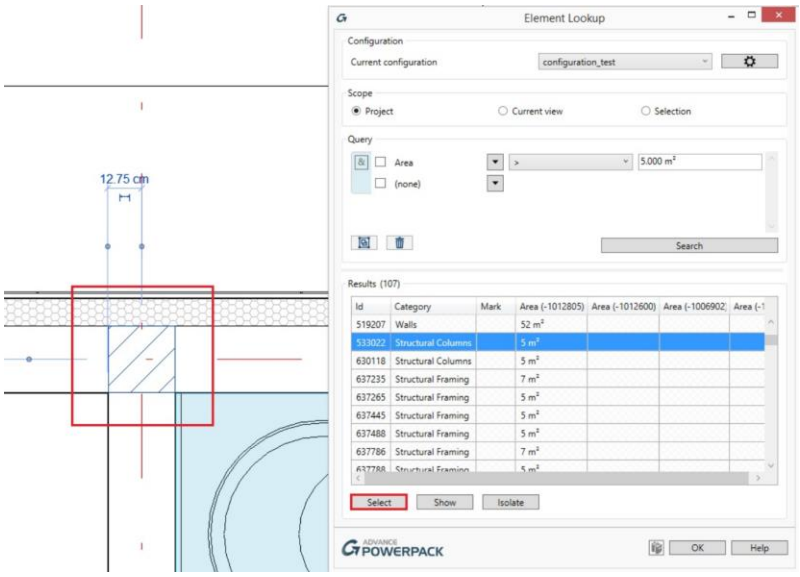
You can set up a list of multiple queries, and search elements by filtering the parameters. By default, all type of parameters are available in the list, but you can filter them by unchecking one of the categories: **Built-in** | **User-defined** | **String** | **Number** | **Integer** | **Y/N** | **Element based parameters**.

Depending on what type of parameter you choose certain options are available: =, !=, >, >=, <, <=, contains, does not contain, begins/ends with, does not begin/end.





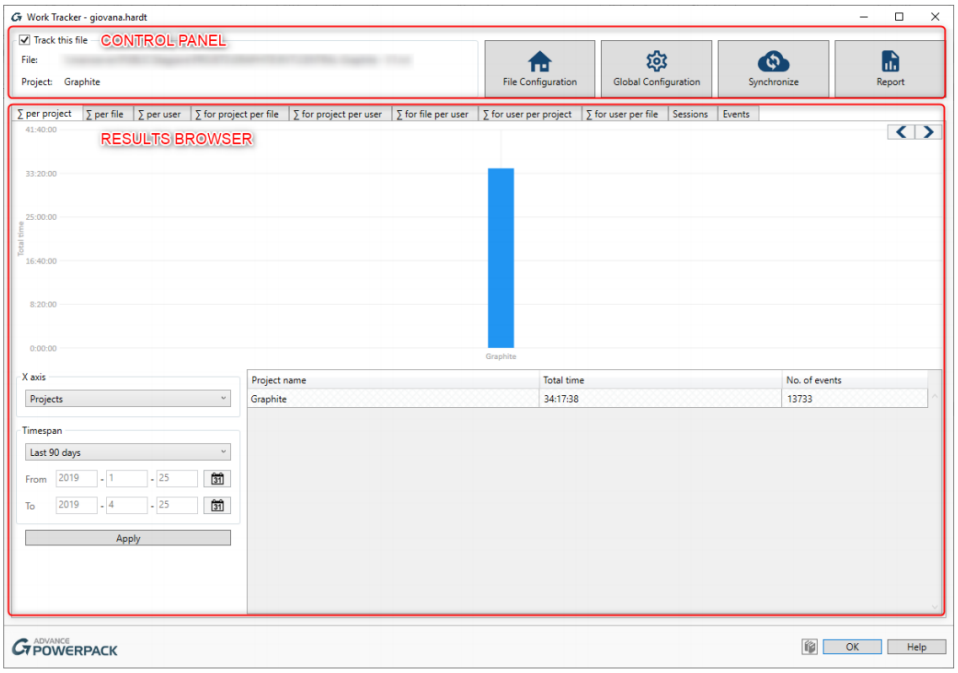
After pressing **Search**, all the elements that fit your query criteria will be listed. By clicking on an element in the list you can choose to **Select** | **Show** | **Isolate** it in the project. Multiple selection is available by pressing and holding the CTRL key.



7 Work Track Tools

Work Tracker gives the user the functionality which enables them to have better control whilst working in Revit. This tool allows the registering of time spent by users while working on individual Revit files.

The main window can be divided into two parts (see below), this is the Control Panel and Results Browser:



The control panel allows to manage the different Work Tracker options. The results browser, on the other hand, shows the different results. Each one of its functionalities will be detailed further in this document.

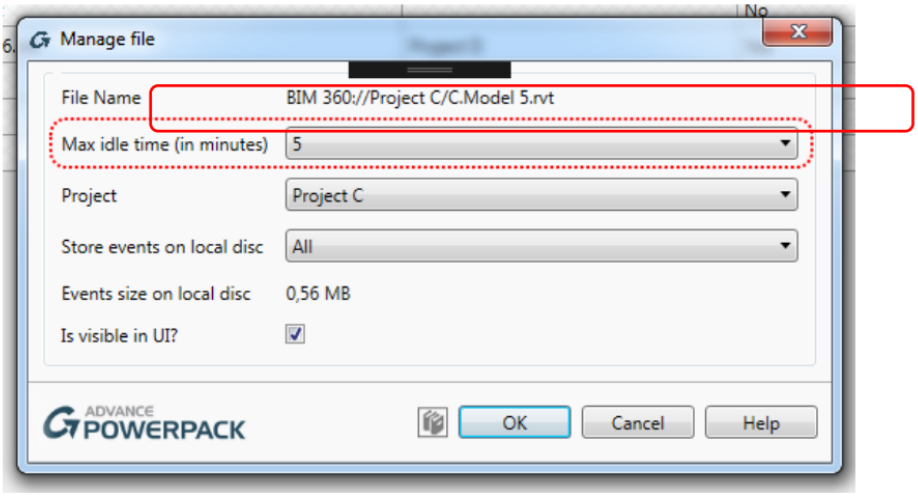
The Work Tracker uses the concept of events to control the user's actions in the project. These events can be:

- Every action that is done or undone on a document (actions that are visible in Revit Undo menu);
- Switching active view;
- Opening/saving/closing document;
- Synchronizing local document with central document.

Each one of the events has an associated date and time, what allows the refinement of the data associated to them.

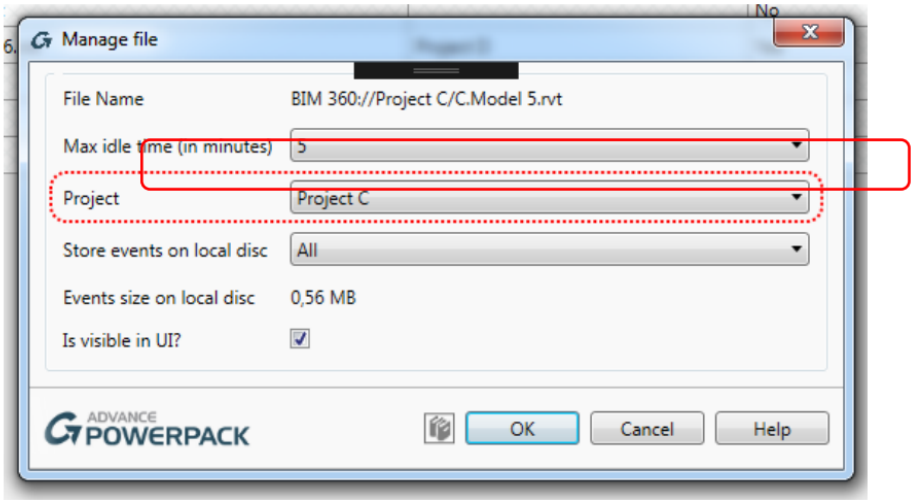
7.1 File Configuration

This functionality defines the working time, which is associated to an idle time. The time between two consecutive events is considered as working time if it is less than Max idle time. This parameter is set for each Revit file individually and can be set at any point in time.

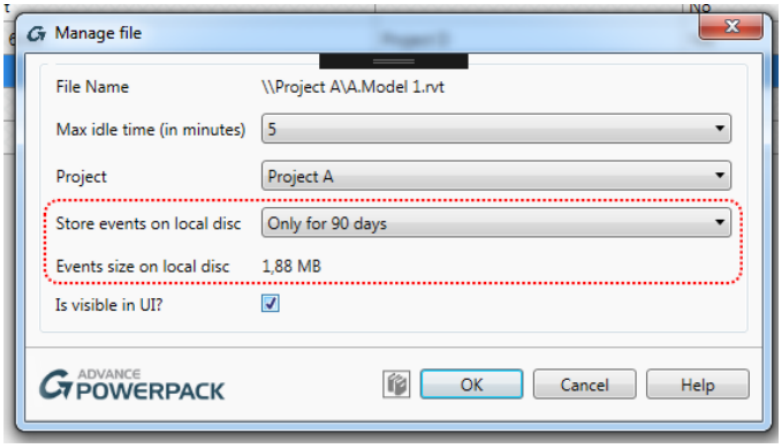


The notion of working time is important to the concepts of session and events. A session is defined as a group of events, in which the distance between each consecutive event is smaller than Max idle time.

This tool demands the assignment of a unique project to the file. The projects can be created in the Global Configuration window, which is detailed later in this document.



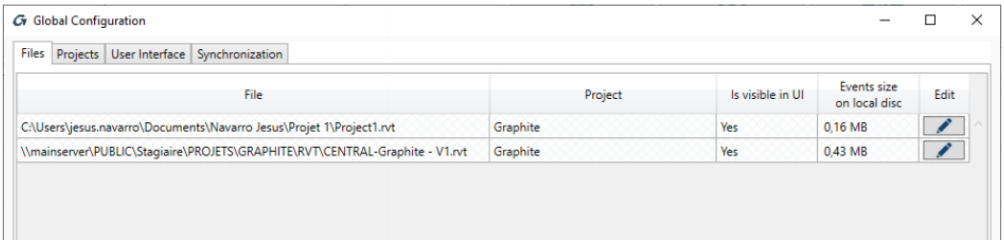
Finally, the user can choose the period in which he wants the events to be stored in the local disc. Since a user can generate up to about 28 800 events per day and thus generate heavy files, there's the possibility to keep only the newest events on the local disc. There is also one another, most important database called Main where rest of the data is stored.



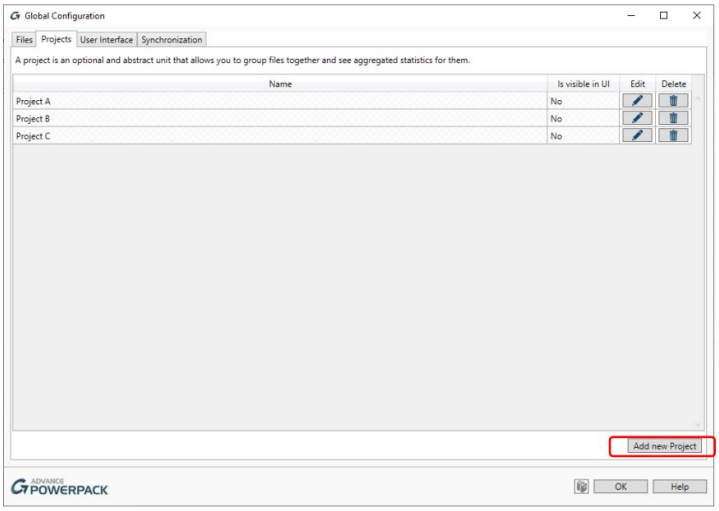
Global Configuration – In a Global configuration window a user can:

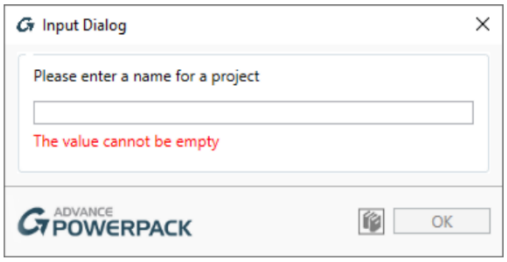
- Manage all tracked Revit files without opening them
- Manage all defined projects
- Adjust user interface
- Set up synchronisation

Files – A user can edit each file individually (file configuration)

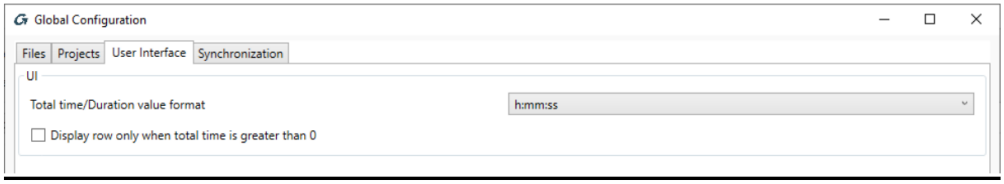


Projects – A Project is an optional and abstract unit that allows the user to group Revit files together and see aggregated statistics for them. Every file can be associated with only one project.



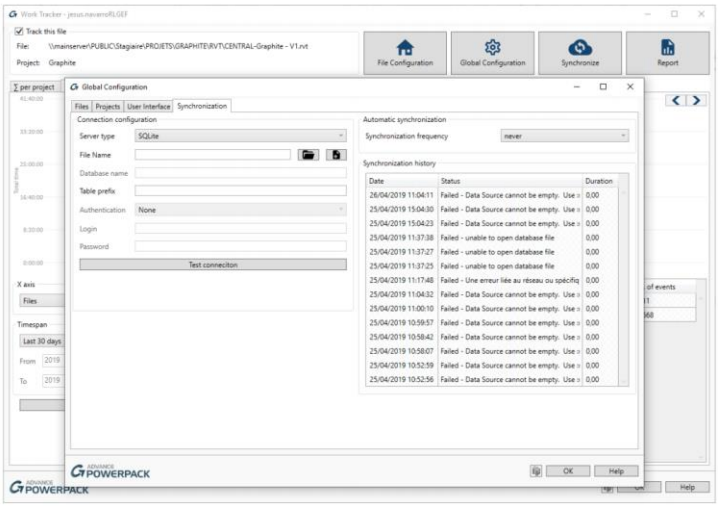


User Interface – This functionality defines the format of time display



7.2 Synchronisation

The Work Tracker data sync is independent of the Revit model sync and needs to be setup individually to work. A user needs to keep a valid connection (in Work Tracker) to be able to see others user data. It is necessary to define the server type and the sync frequency.



If the user wishes the synchronization to be automatic, it is possible to choose an automatic synchronization frequency. This background synchronization is completely seamlessly and does not interfere with working with a model in Revit. For manual synchronizations, it is necessary to define “Never” in this window and then synchronize directly in the main window. This tool allows the user to synchronize manually the project whenever he wants. The database source must be defined previously.

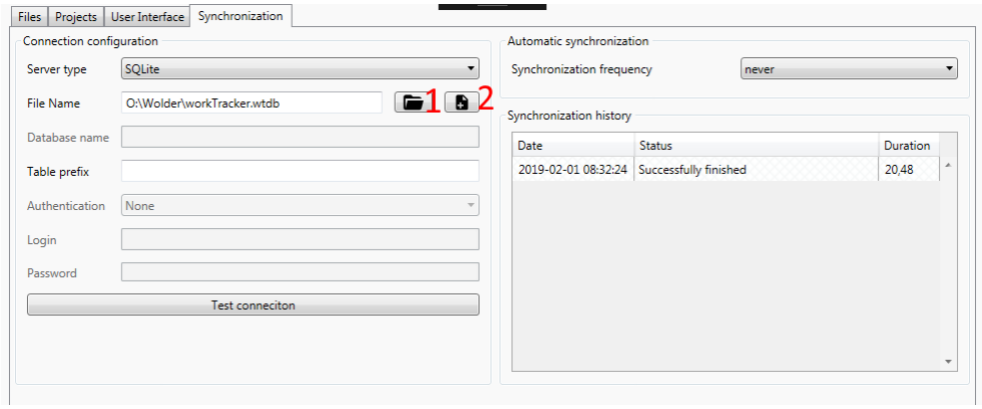
If network errors occur and cause the automatic synchronization process to fail, the following synchronization will start from the point where synchronization was interrupted previously.

Server Type – The synchronisation can be done with the SQLite file or SQL Server, which are selected in the Server Type tab.

7.2.1 SQLite

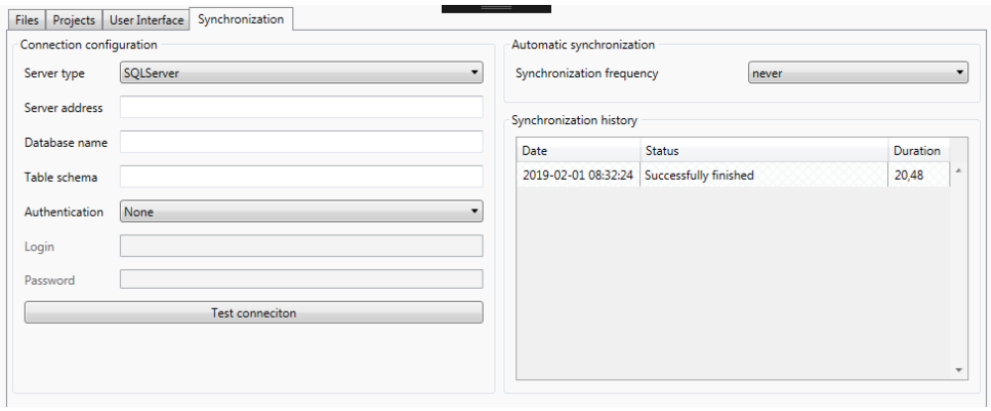
SQL Lite is a file database, so to make synchronization work it is necessary to create a place on the network disc where all users have access to write and read.

If there’s already an SQLite database file, the user can call it with button 1. Otherwise, f there’s no SQLite database file yet, it is possible to use button 2 to create it on network storage.



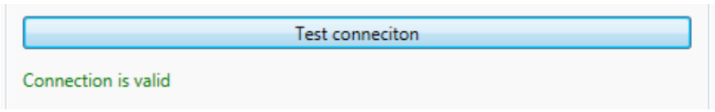
7.2.2 SQL Server

In this scenario, the user must have a working instance of SQL Server. The database is created automatically by Work Tracker on the server, so it is important that provided credential used to log in to SQL server have enough permission to create SQL objects on the server.



7.2.3 Test Connection

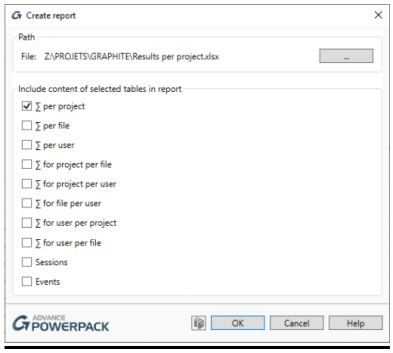
After filling all the necessary data to establish a connection, it is important to Test connection if it is working. If the connection is not valid, synchronization will fail.



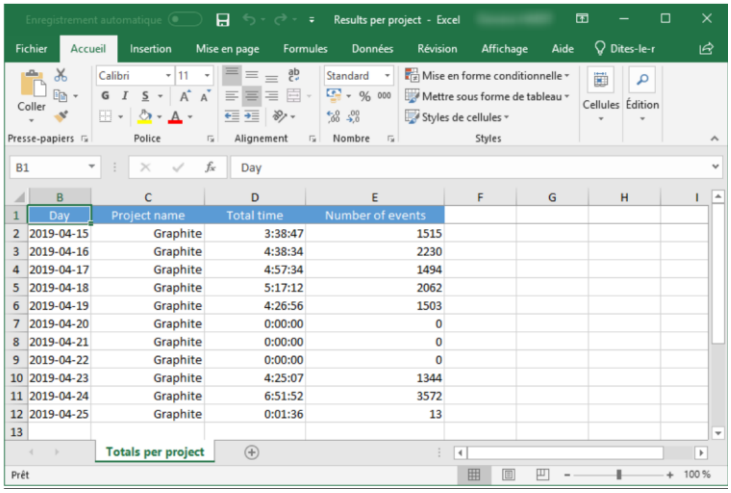
7.3 Report

The data visible in the tables can be exported to an Excel file (.xlsx). Microsoft Excel does not have to be installed for this tool to work.

It is possible to choose the content of the tables reported, as well as the location of the file.

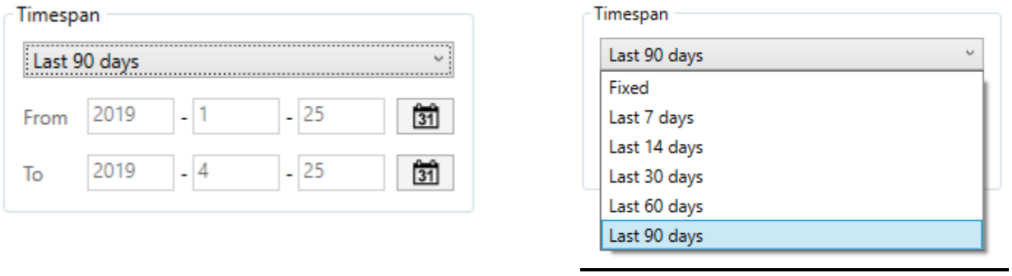


The file generated by Work Tracker looks like the image below:

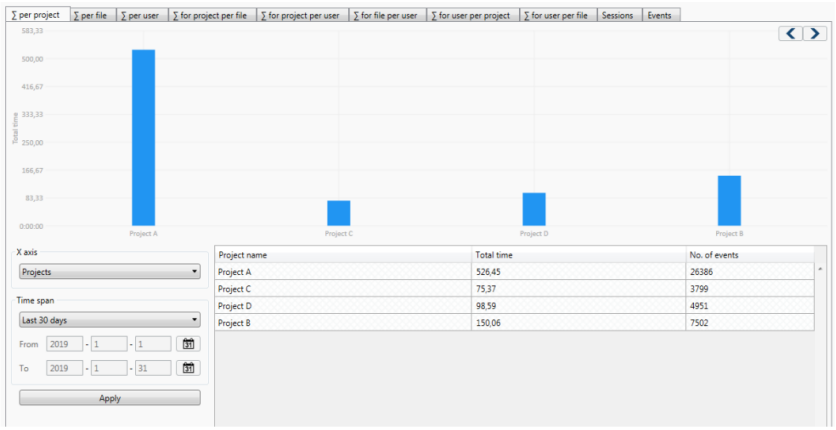


Day	Project name	Total time	Number of events
2019-04-15	Graphite	3:38:47	1515
2019-04-16	Graphite	4:38:34	2230
2019-04-17	Graphite	4:57:34	1494
2019-04-18	Graphite	5:17:12	2062
2019-04-19	Graphite	4:26:56	1503
2019-04-20	Graphite	0:00:00	0
2019-04-21	Graphite	0:00:00	0
2019-04-22	Graphite	0:00:00	0
2019-04-23	Graphite	4:25:07	1344
2019-04-24	Graphite	6:51:52	3572
2019-04-25	Graphite	0:01:36	13

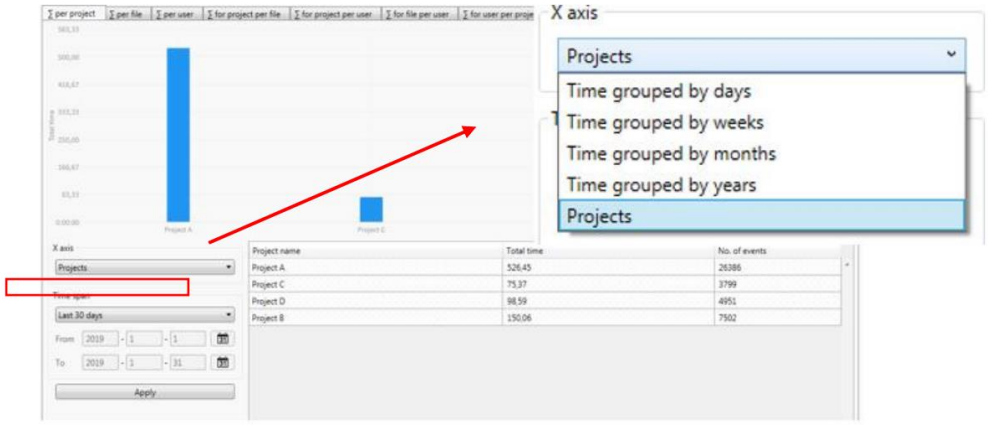
Results Per Project - The results of the events tracking can be displaced in many ways, per project, per user, and per file. The timespan of events van be selected according to the options below. The user can also choose directly the dates required.



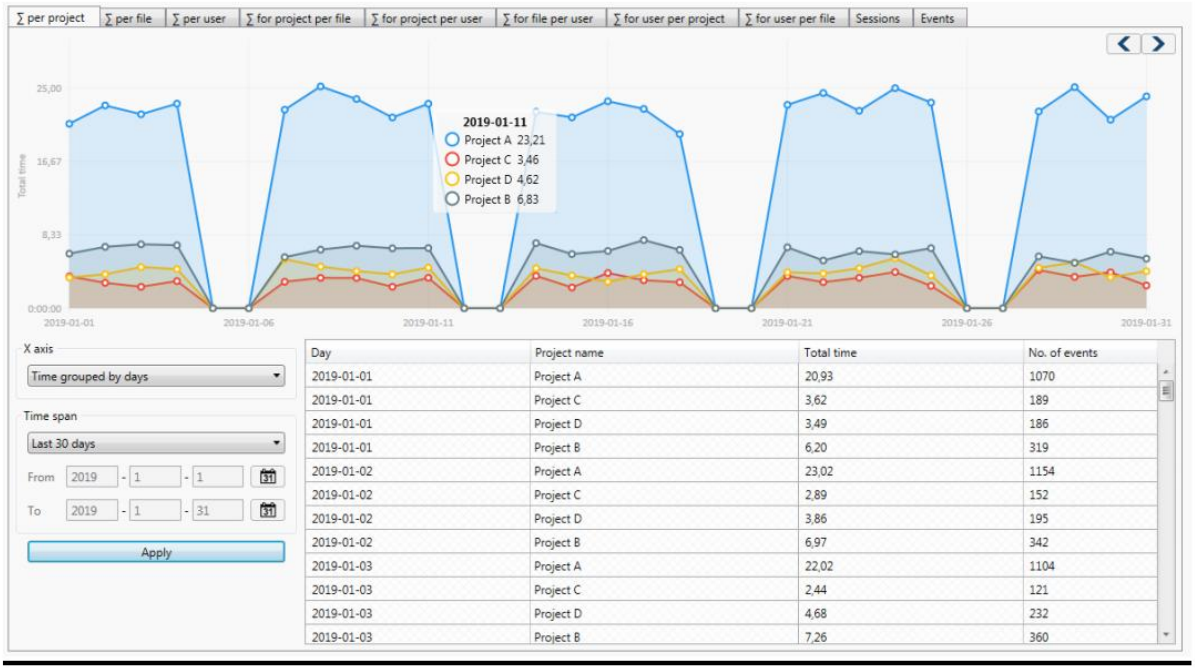
The graphics are shown in the form of histograms, such as exemplified below.



If the user wishes to display the results in a more detailed way, there's also the possibility of displaying the results per time, which can be in the form of days, weeks, months or years.



The graphics are then shown in curves, such as the figure beneath shows.



Day	Project name	Total time	No. of events
2019-01-01	Project A	20,93	1070
2019-01-01	Project C	3,62	189
2019-01-01	Project D	3,49	186
2019-01-01	Project B	6,20	319
2019-01-02	Project A	23,02	1154
2019-01-02	Project C	2,89	152
2019-01-02	Project D	3,86	195
2019-01-02	Project B	6,97	342
2019-01-03	Project A	22,02	1104
2019-01-03	Project C	2,44	121
2019-01-03	Project D	4,68	232
2019-01-03	Project B	7,26	360

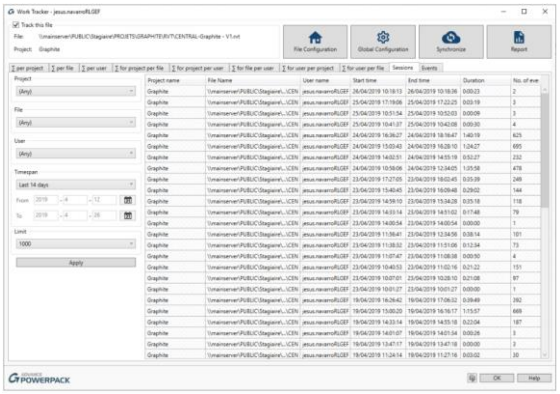
7.4 Additional Results Types

Results can be reported for individual aspects, these include the following:

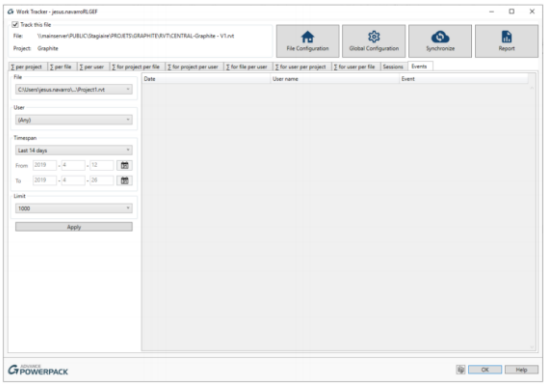
- Results Per Projects
- Results Per File
- Results Per User

Each will provide graphs, charts and timespans. For more information please refer to Help when using the tool.

7.5 Sessions & Events



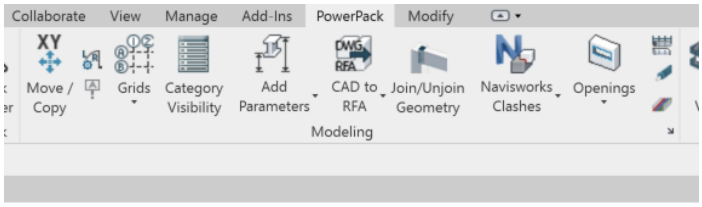
This view shows recorded sessions (group of events)



This view shows recorded events

8 Modelling Tools (General)

The Modelling category part of the Graitec PowerPack for Revit is filled with tools to perform changes to your model in simple steps. Tools include the ability to split Pipe / Duct into multiple lengths or choose to join/unjoin multiple building elements with one simple click and avoid repeating multiple steps.



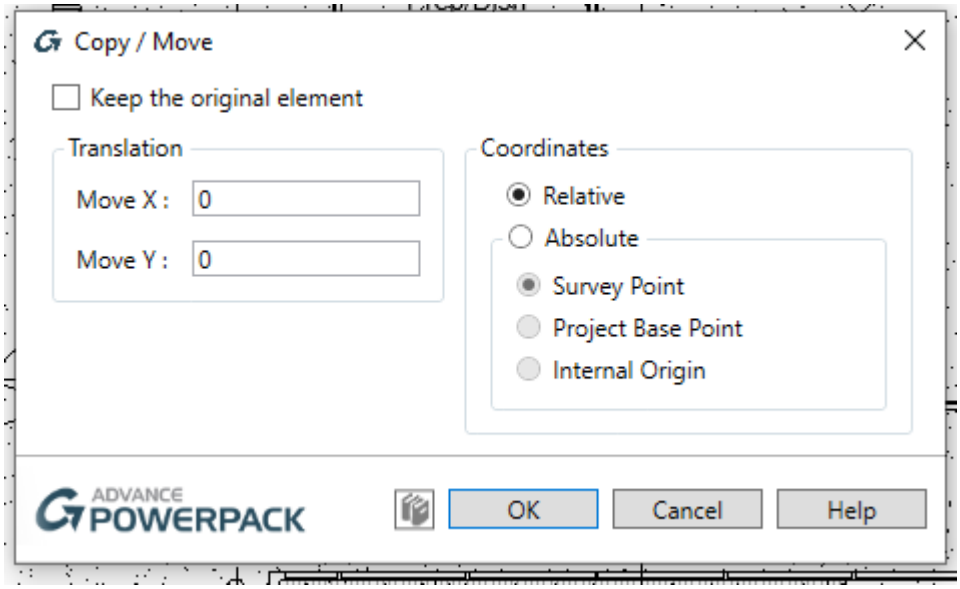
The modelling configuration part (arrow in the bottom right of the ribbon) applies to all modelling tools. This function allows the user to define some of the modelling options for the tools in this section. These include:

- Model Lines
- Room Finishes

8.1 Move XY

The Move XY command part of the Graitec PowerPack for Revit ribbon can be used for moving elements in the plane, with specific values for X and Y coordinates

Click or use a selection rectangle to select elements individually, and then select **Move XY** from the ribbon. You will be presented with the dialog box below:

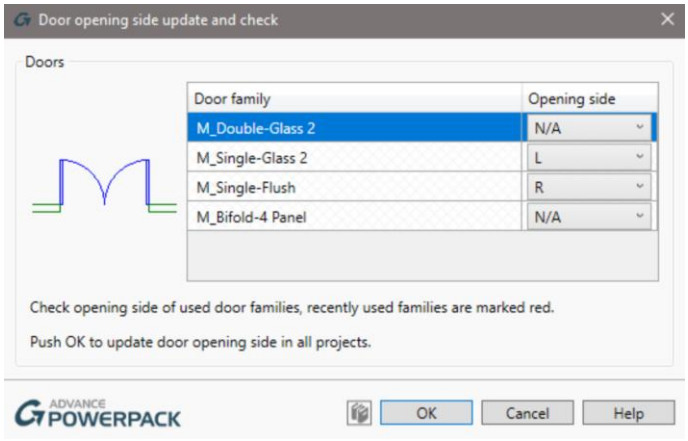


Enter the specific values for the X and Y direction, and then click OK to quickly and accurately move specific elements in the plane. The feature recognizes abbreviations such as 1m, 1 dm, 1 cm, and it also works with decimals. This can be done relative to its current position or Absolute to the Survey Point / Project Base Point / Internal Origin.

8.2 Door Side

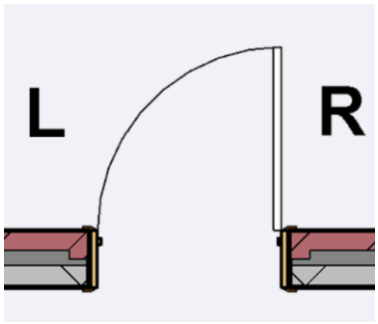
While working on a Revit project, select the Door Side command from the Tools category in Graitec PowerPack for Revit, to modify the side opening of any door family in Revit.

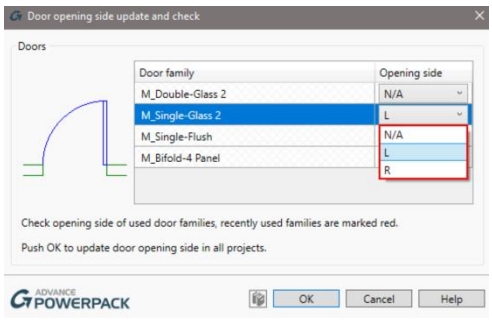
Click on the Door Side icon to open a dialog box showing a plan preview geometry of the door family, the name of the family and the opening side. The Door Side command automatically creates the shared parameter "G.Door.Side", making it easier to change side openings of any door family. The shared parameter can be used in labels and tables



The command distinguishes between a left-wing door (marked L) and a right-wing door (marked R), providing more control over the individual door family

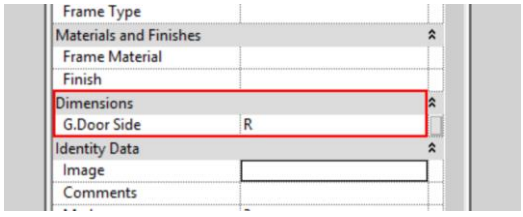
If the door doesn't open on a right or left side (for example, double, turnstiles, sliding or folding doors), N/A (Not Applicable) will be displayed in the dialog.





To update the side opening doors throughout the project, select the command again. When the dialog is reopened, the newly loaded families are highlighted in red. You only need to check and "calibrate" the red family door names, pick between L (left-wing), R (right-wing) or N/A (not applicable), and then press OK to update the door family.

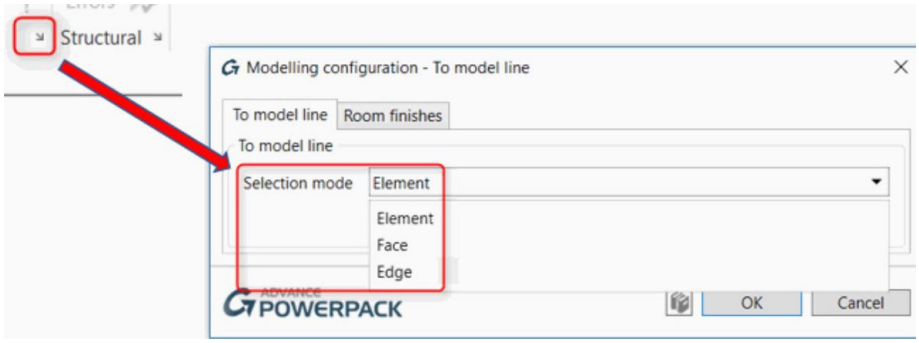
The opening side is displayed in the labels and in tables using the shared parameter (G.Door.Side) created automatically by the command. To access Properties, select the door element, right-click on it and select Properties.



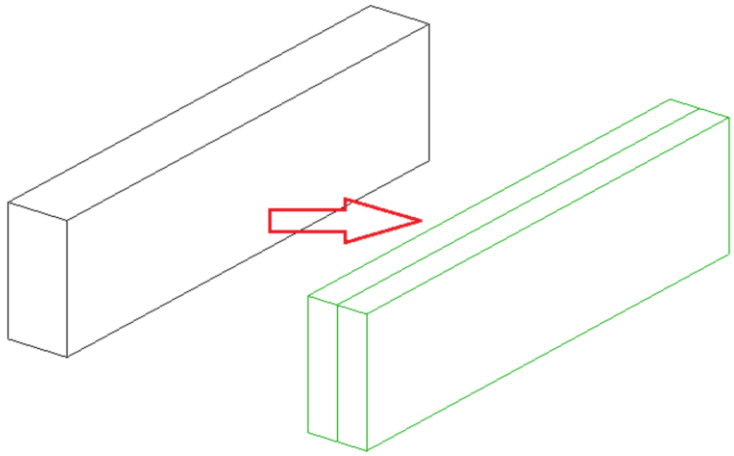
8.3 To Model Line

To model line command part of Graitec PowerPack for Revit, located in the Modelling category, can be used to draw model lines on the selected elements.

Check the Selection mode that best suits your needs: Element, Face or Edge. Each of these selection modes produces different outputs.



Selection mode Element will draw lines on all edges of the element. This mode is capable of recognizing all the layers of a specific element, including compound layers of the wall.



- Selection mode **Face** will draw model lines on the selected face edge
- Selection mode **Edge** will draw model lines on the selected edges

Click on the To Model Line icon to and proceed with selecting specific elements for which PowerPack for Revit will draw model lines. Batch selection of elements is available

8.4 Grids

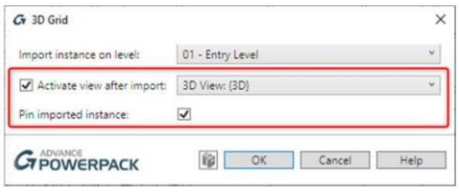
There are several functions within the Grids command. This includes:

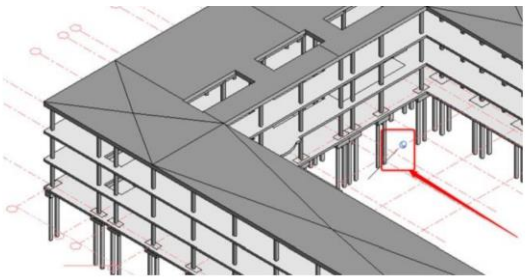
- 3D Grid
- Align Grids Horizontally
- Align Grids Vertically
- Show/Hide Grid Bubbles

8.4.1 3D Grid

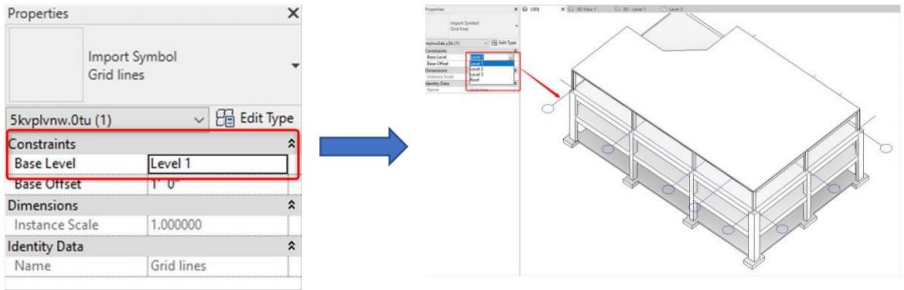
The main benefits to using 3D Grids includes the ability to make the grids visible in 3D views, group all 3D Grids into a Revit symbol, and to manage the visibility of these 3D Grids and levels with native Revit tools.

This feature enables users to convert all Grids among a Revit Project into a Revit symbol, making them visible in a 3D view. By picking one grid, the 3D grids feature will convert all Revit grids and prompt the user to open a specific Revit view. The option will also allow the user to choose the level placement before and pins the Grids automatically

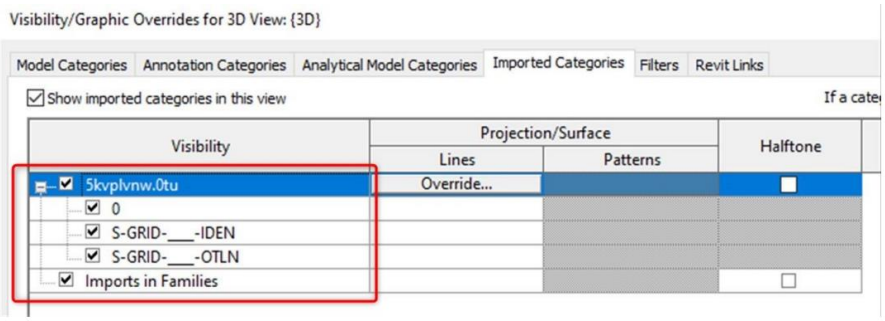




Grids will be then visible in 3D views, and the level of those ones could be set through native Revit instance parameter of the symbol.

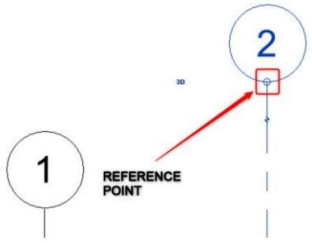


As the grids will be associated to a Revit Import Symbol, users have to use the Visibility/Graphics Overrides windows in order to switch on/off grids visibility.

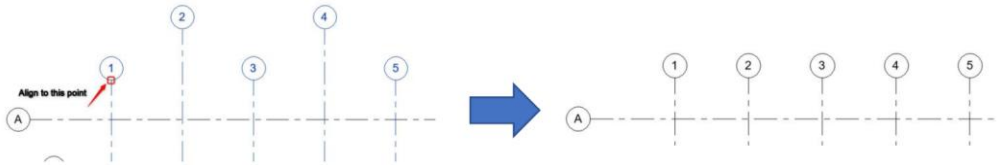


8.4.2 Align Grids

When selecting several grids in Revit, the snapping mode is no more available, making them impossible to align a selection of grids precisely according a dedicated point. Those two features move the base of the bubbles grid automatically to the point on the view specify by a click.



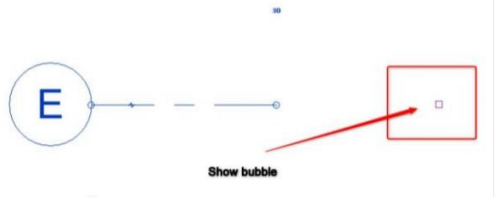
The total length of the grid will not be changed

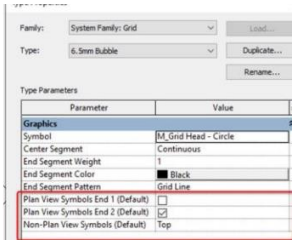


Graitec Powerpack has two alignment methods naturally, horizontally and vertically. The behaviour of the Align Grids function on one side will stretch the grids meaning it will not fully move the grids to the opposite direction. This method offers a safer way to align grids on one side, without affecting the existing setting at the opposite side.

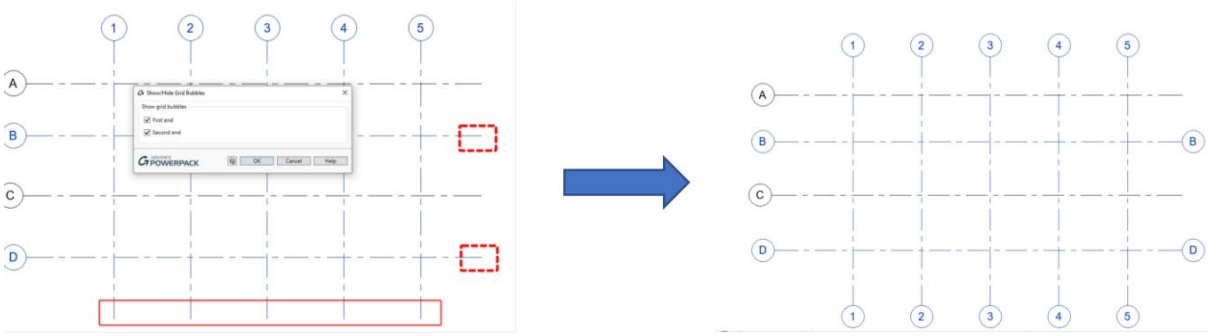
8.4.3 Grids Bubble Visibility

Native Revit commands propose two complementary functions to manage bubble visibility on grids, either through properties palette or smart symbols when selecting one grid.





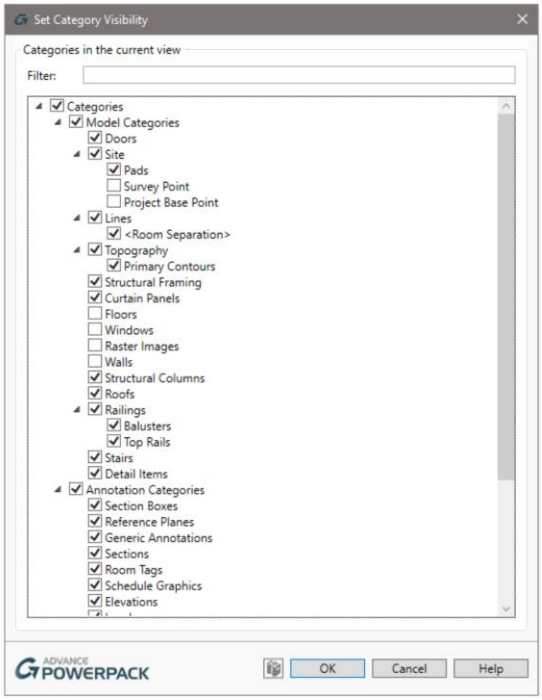
With this new command, users will have a single tool that will allow them to show/hide bubbles on one or a manual selection of grids.

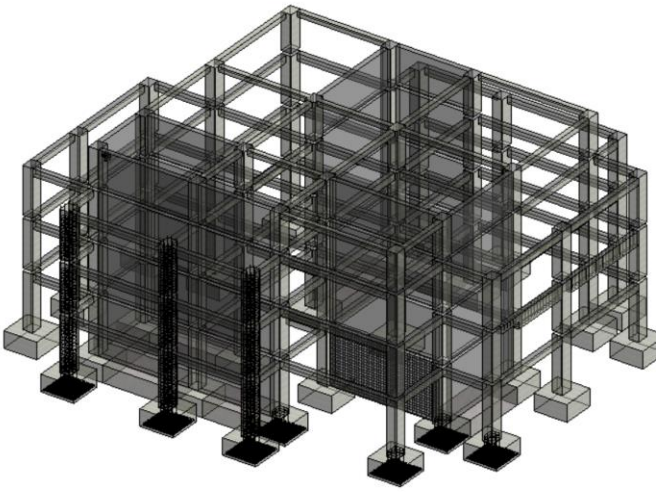


8.5 Category Visibility

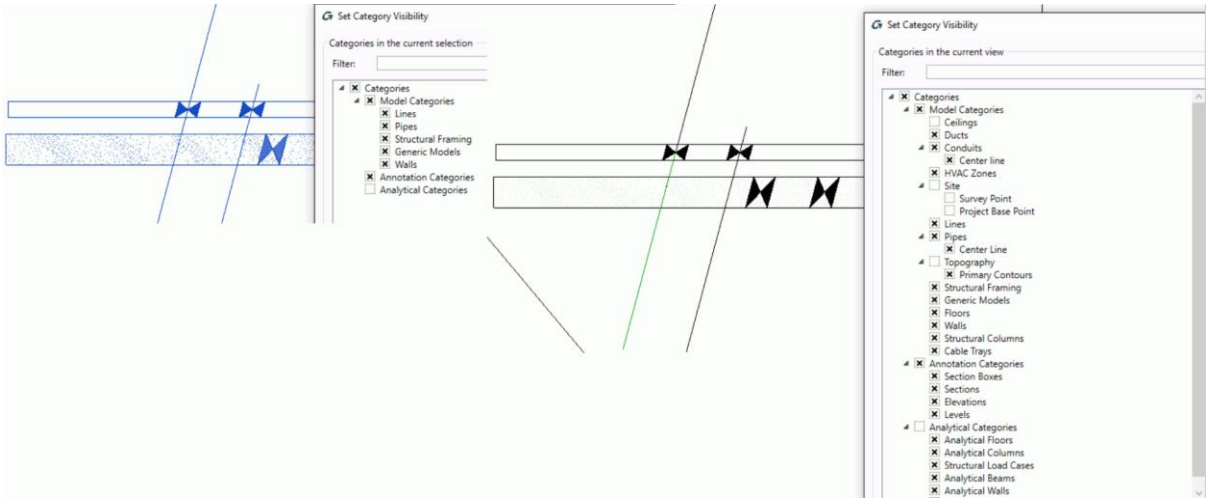
The Category Visibility command part of the Graitec PowerPack for Revit ribbon tool can be used to better manage categories of elements found in the building model.

Click on the Category Visibility icon to open a dialog box for quickly switching the visibility of selected categories of objects (floors, walls, windows, etc.) in the current view / selection.





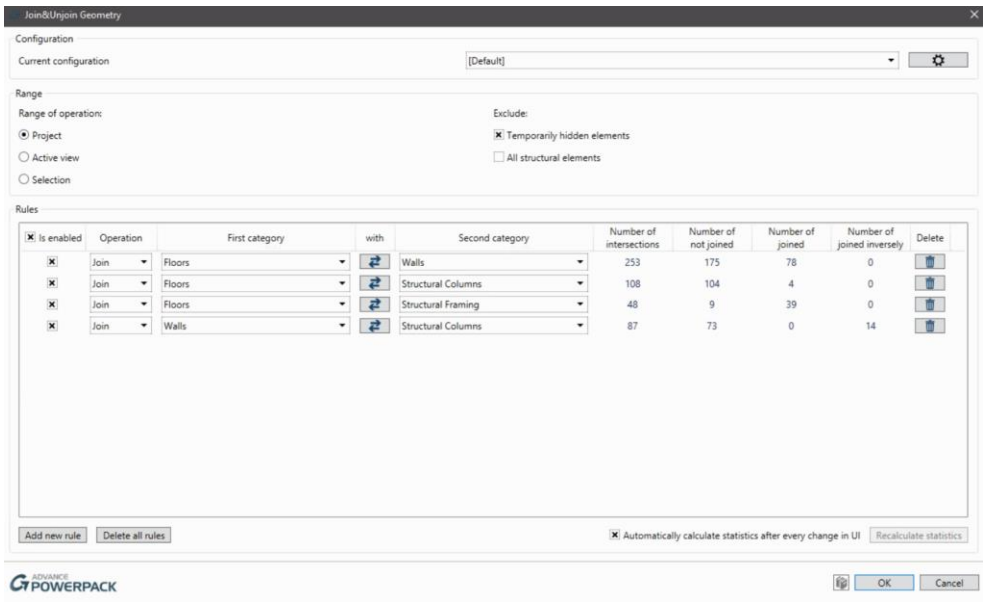
Categories in the view can be filtered by name, simply type the name in the Filter box. The Category Visibility works in the following way: if elements are selected, the tree will only list the corresponding categories. Otherwise, all categories from the current view will be displayed.



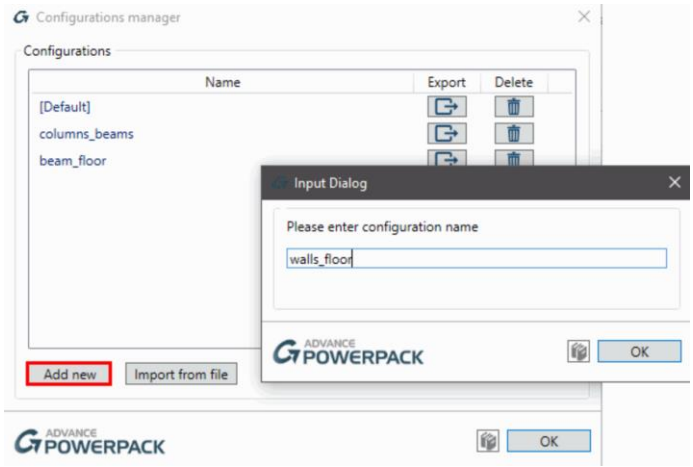
8.6 Join/Unjoin Geometry

The Join & Unjoin Geometry icon part of Graitec PowerPack for Revit lets you join, unjoin and switch the join order of Revit elements. This is an automated function with which you can choose what type of element to join to another, and easily switch the order of the join condition

Click on the Join & Unjoin Geometry icon to open the dialog box for joining geometry / switching the join order of elements



The dialog only shows a "default" configuration. You can create new configurations by clicking on the Gear Icon, which opens a new dialog used for entering a configuration name. Configurations can be exported and saved, for future use in other projects.



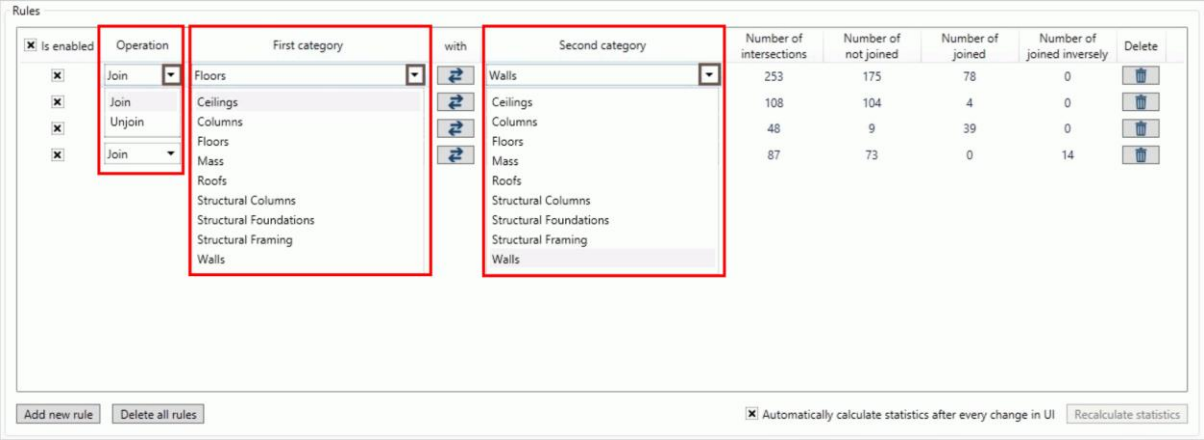
After you finish creating/importing/exporting the configuration pre-sets, they will be listed in the current configuration drop-down menu, where they can be easily accessed and used. The major advantage of the tool is that all three disciplines in Revit can have separate pre-sets.

The Range section of the dialog refers to the range in which the tool can operate and the elements to include/exclude from the process.

- Range of operations: select from the available options: Project (affects all visible elements in the entire project), Active view (affects the elements from the current view) and Selection (joins a selection of elements).
- Exclude: select from the available options: Temporarily hidden elements (exclude/include the hidden elements in the joining process) and All structural elements (exclude all the elements that are structural).

The Rules section includes three major categories, each with a drop-down menu with several options:

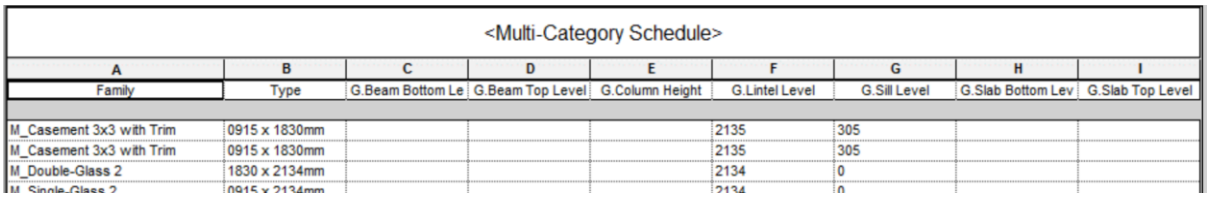
- Operation refers to the type of functionality you want to perform
- First category and Second category list all the elements that can be joined or un-joined
- To enable or disable a certain rule, select or deselect the corresponding check box under Is enabled
- To swap the first category with the second category, click the button from the with column
- The last 4 columns in the Rules section display statistic information: Number of intersections, Number of not joined, Number of joined and Number of joined inversely



8.7 Add Parameters

The Add Parameters category part of the Graitec PowerPack for Revit offers a set of commands to add additional shared parameters for specific types of objects, such as columns, walls, beams, slabs, lintels and sills

All these parameters can be used, for example during the preparation of schedules, and can easily be used to filter the information



From this category, you can access the following functions:

- The **Column Height** command generates the G. Column Height parameter.
- The **Beam Elevation** option generates the G. Beam Top Level and G. Beam Bottom Level parameters.
- The **Wall Height/Wall Thickness** options generate the Wall Height and Wall Thickness parameters
- The **Slab Elevation/Slab Thickness** options generate the G. Slab Top Level, G. Slab Bottom Level and G. Slab Thickness shared parameters.
- The **Foundation Elevation** option generates the G. Foundation Top Level and G. Foundation Bottom Level parameters
- The **Coordinates & Level** command adds shared parameters for structural elements such as foundations, columns, beams, walls and floors.
- The **Room Finishes** option detects all floor types present in a specific room and adds the G. Floor Type parameter.
- The **Lintel/Sill Elevation** command generates the G. Lintel Level and G. Sill Level shared parameters.
- The **Pipe Thickness** option adds a G.Thickness parameter which interrogates the pipe wall thickness.
- The **MEP Elements Offset** tool adds a G. MEP_Offset parameter, which interrogates the offset of the element.

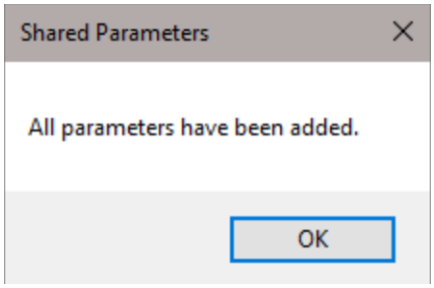
For more information on the individual category please refer to the help section within the tool, there is an example for each.

8.7.1 Add All

The Add all command part of Graitec PowerPack for Revit adds shared parameters created with Dimensioning tools.

Click on the Add all icon to launch the feature. The feature adds all the dimensioning parameters to all listed elements, if they were not previously added.

Add all command adds shared parameters and displays a message with the operation status when completed, as in the example below

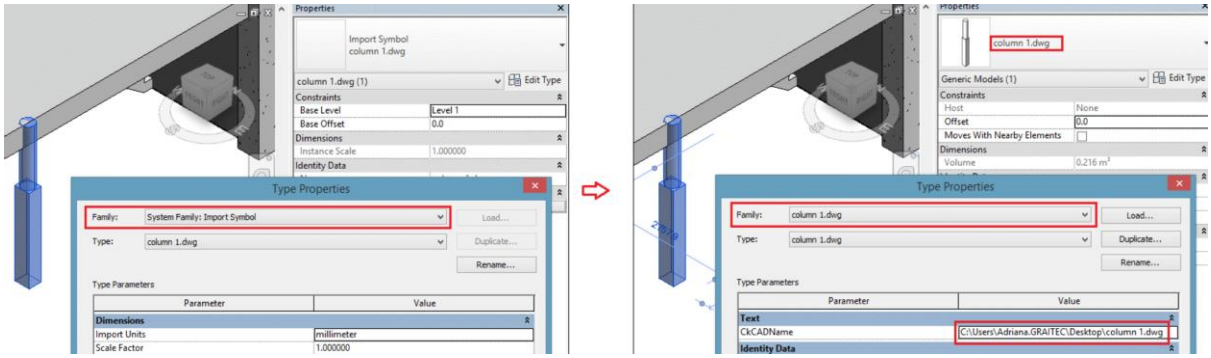


8.8 CAD to RFA Converter

The CAD to RFA Converter feature part of Graitec PowerPack for Revit converts 3D drawings to Revit families and updates them

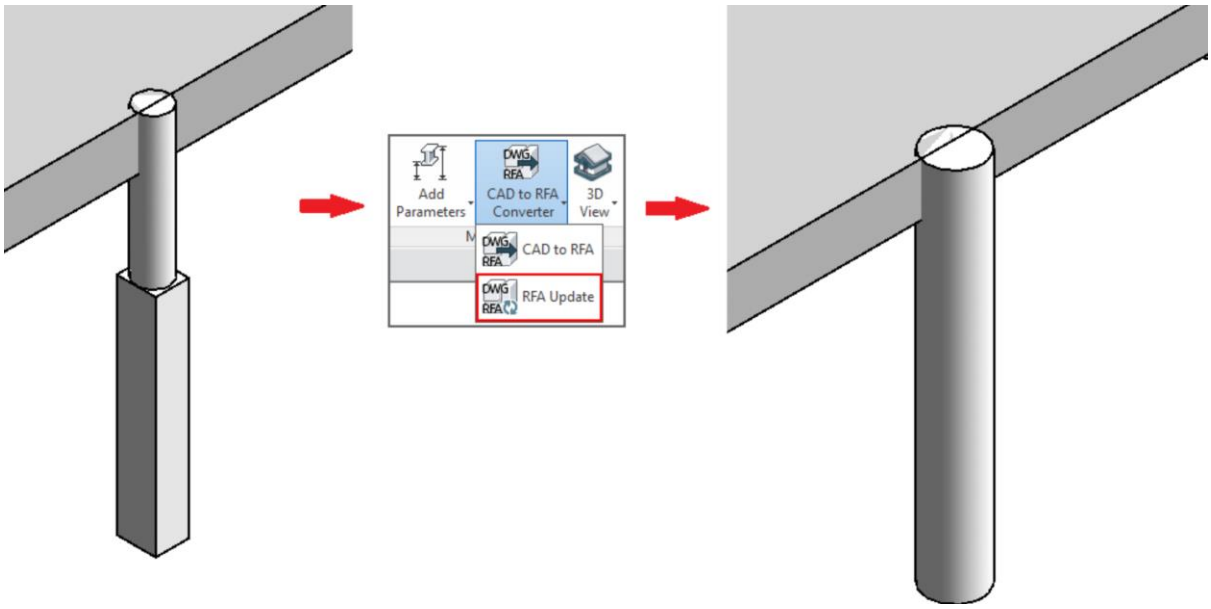
Click on the CAD to RFA Converter icon to view the two available options: CAD to RFA and RFA Update. CAD to RFA converts 3D drawings into Revit families (Generic model). The families created from the CAD drawing are saved in the same location as the initial CAD file.

Before using the CAD to RFA command and creating a Revit family from a drawing, make sure that the drawing is linked to the project. Next, select the symbol inserted in the project.



After the command is applied, the imported symbol is converted into a family object, as you can see from the properties list. If the original 3D drawing is changed, the family from the Revit project can be updated using the RFA Update option.

Simply click on the CAD to RFA Converter icon and then RFA Update



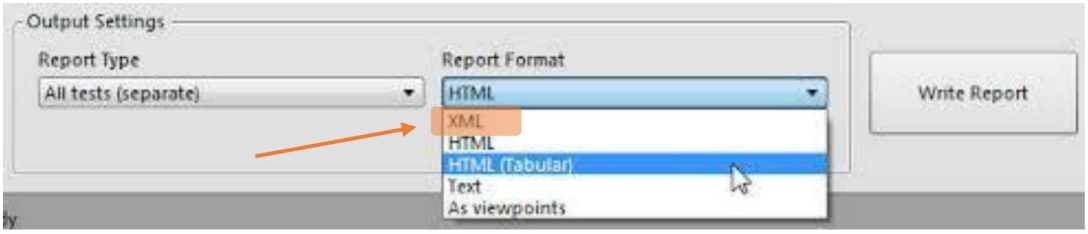
8.9 Navisworks Clashes

This new feature allows users to visualize inside Revit, Clashes on Revit models detected by Navisworks. The workflow starts from Revit models send to Navisworks for clash detection.

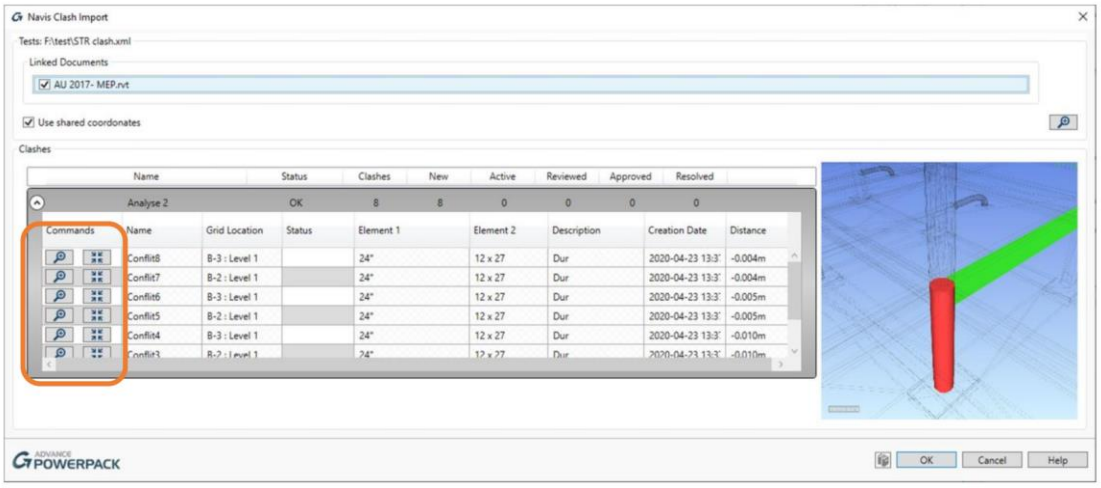
There are two main benefits to this tool:

1. Contribute to strength workflow between Revit and Navisworks, both products available in AEC Collection
2. Take benefits from advanced Clash Detection made in Navisworks to create consistent Revit models

This Clash Detection Report has to be exported as an XML file to be read by the Powerpack.



Thus, the Navis Clash import tool can read this file, and offer previews of the clashs, zoom around the space zone concerned or isolate the objects involved in the collision.



9 Modelling Tools (MEP Specific)

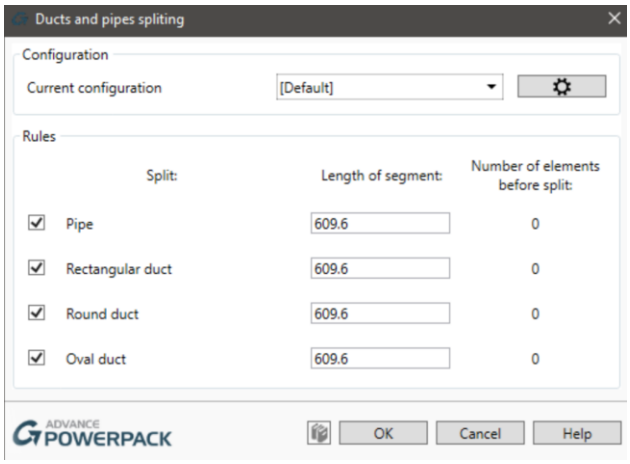
Within Graitec PowerPack for Revit Modelling Tools, there are some features that are specific to MEP Design. These are:

- Split Pipes
- Pipe Insulation
- Cable Length
- Openings (Join & Pipe Openings)

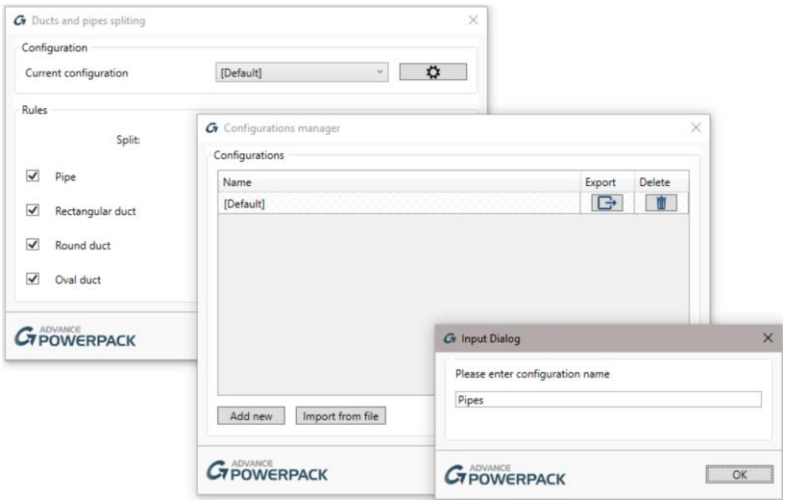
9.1 Split Pipes

The Split Pipes command part of Graitec PowerPack for Revit divides ducts and pipes into smaller segments.

Click on the Split Pipes command to open the dialog box



Create or import a configuration:

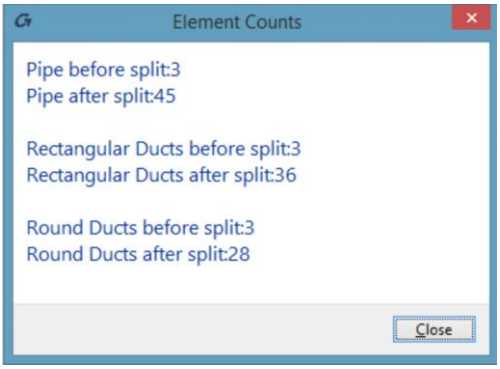


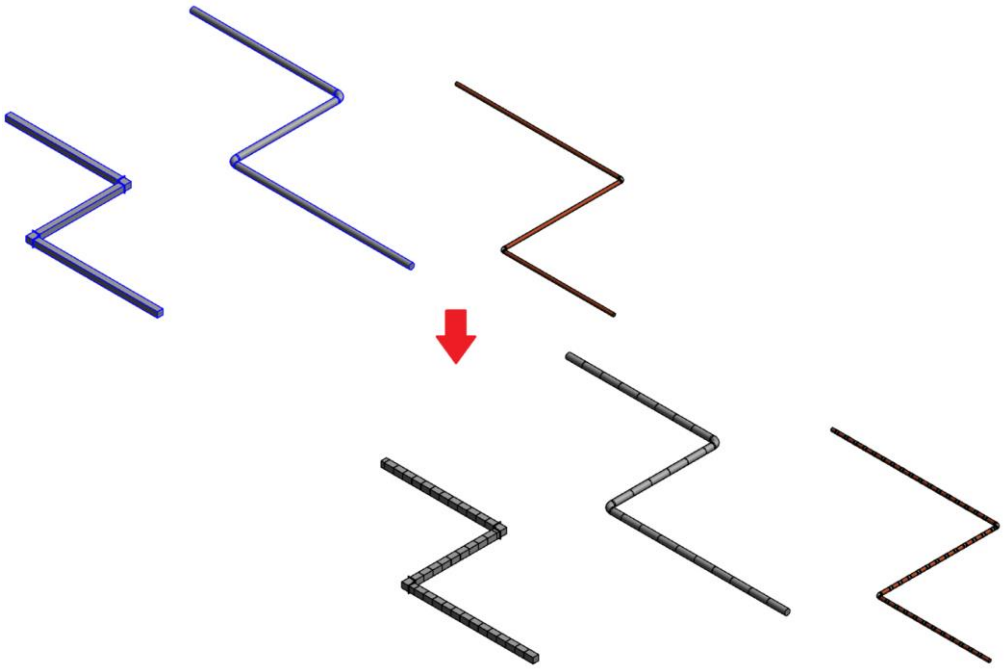
Click on the Import from File icon to browse your computer and import a previously saved configuration in the .xml file format

Some rules must be applied to the configuration:

- Check the desired boxes to decide which MEP elements are taken into account in the split process: pipes, rectangular, round or oval ducts.
- Select the length of the segments into which you want to divide the current ducts and pipes.
- The dialog displays the number of elements before split, for each type of element

After the length is set, click OK to divide the elements. Once the command is applied, a dialog box will appear indicating the total number of ducts and pipes that have been converted.

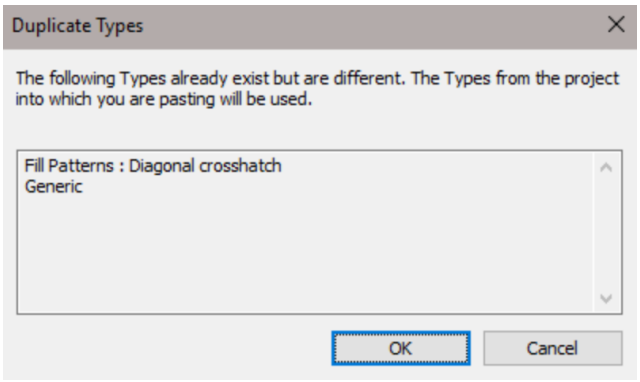




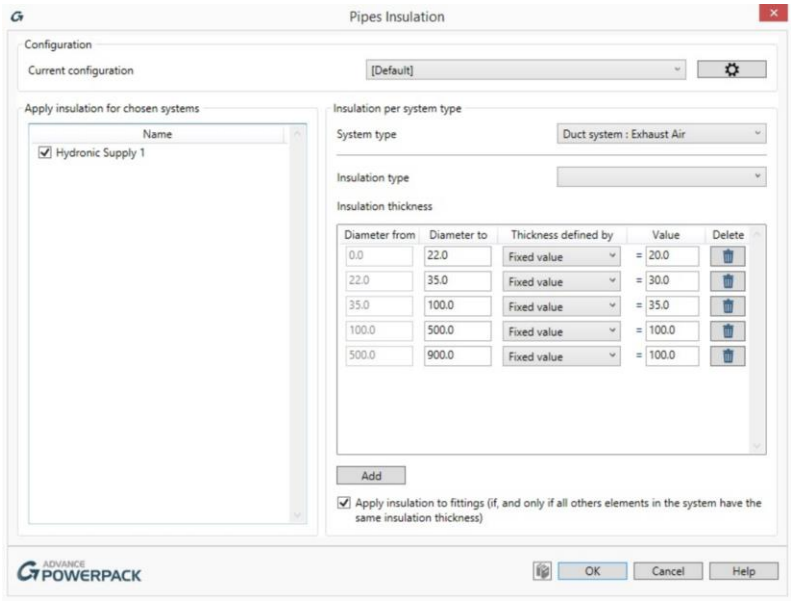
9.2 Pipe Insulation

The Pipe Insulation command part of Graitec PowerPack for Revit creates insulation on pipes and ducts based on the system type and thickness settings.

Click on the Pipe Insulation icon and PowerPack will begin to scan your project. PowerPack automatically detects if certain types already exist in the project

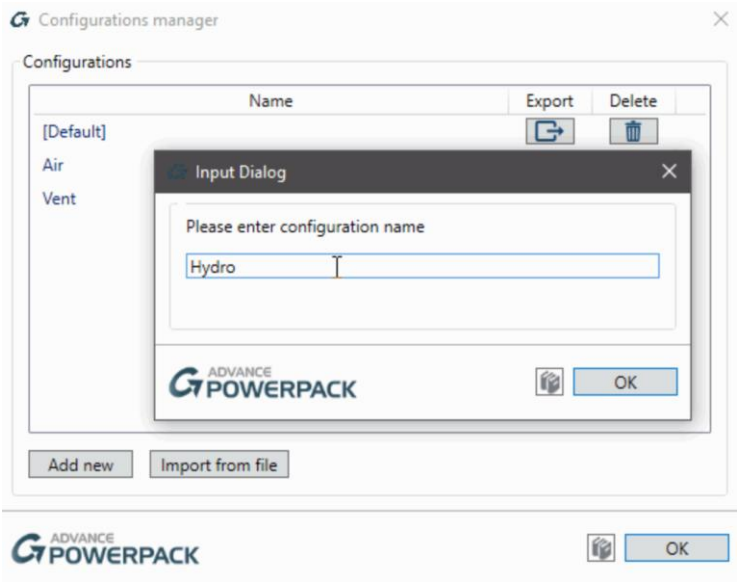


The command automatically assigns insulation to the systems based on parameters such as the outer or inner diameter, or assigns a specific value



Click on the settings button to access the Configurations manager dialog and add pre-sets based on the rules that are currently used.

By the dialog only shows a "default" configuration. You can create new configurations by clicking on the gear which opens a new dialog used for entering a configuration name. Configurations can be exported and saved, for use in other projects. Pre-sets can also be imported.

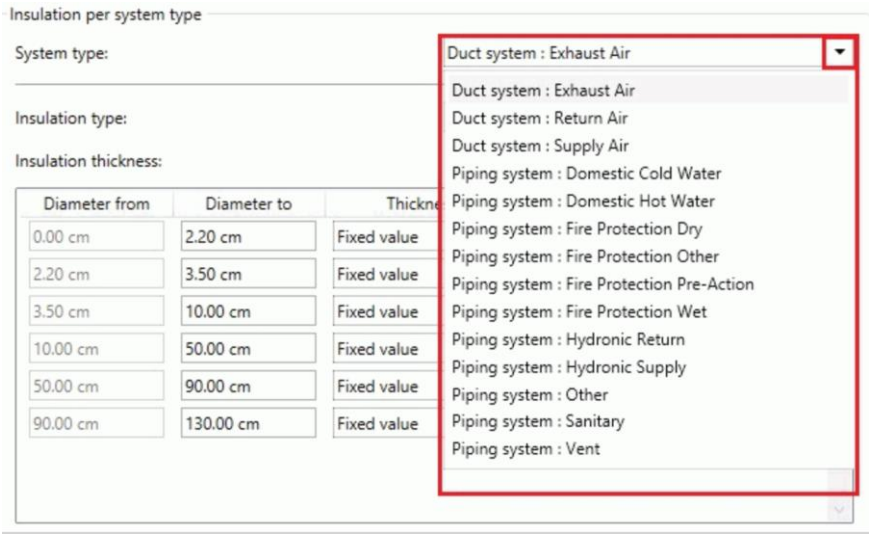


After you finish creating/importing/exporting the configuration pre-sets, they will be listed in the current configuration drop-down menu, where they can be easily accessed and used.

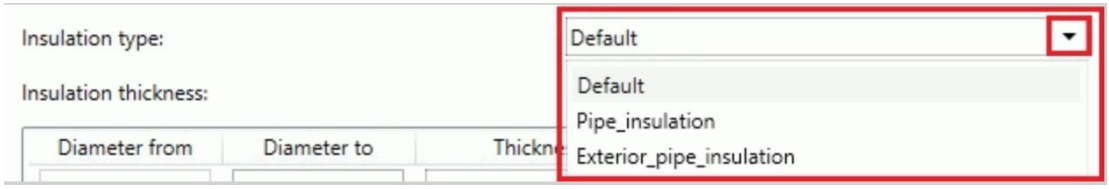
In the Apply insulation for chosen systems dialog, check the desired systems for which the insulation will be applied.

Insulation per system type:

- **System type**: the drop-down contains all Revit system types that can be insulated, allowing you to select a system type on which to apply the insulation. This function speeds up the long process of applying insulation to a large number of pipes



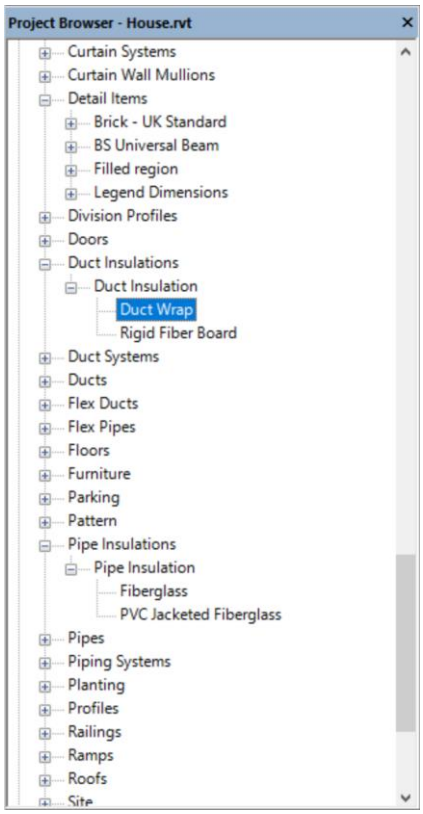
- **Insulation type**: the drop-down lists all pipe insulation materials present in the project



Insulation thickness: lists a collection of parameters that can be added or deleted. The list of parameters defines a set of functions in which the task can perform. For example, pipes with a diameter between 35mm and 100mm will be insulated based on a fixed value of 35mm.

- The **Diameter from** parameter shows the default thickness of the insulation
- The **Diameter to** parameter is editable and allows you to input of a maximum diameter to define a specific range of pipe dimensions in which the command should perform
- You can choose from **Fixed value, Inner** or **Outer** diameter to define the insulation thickness
- You can also set a value for the insulation thickness

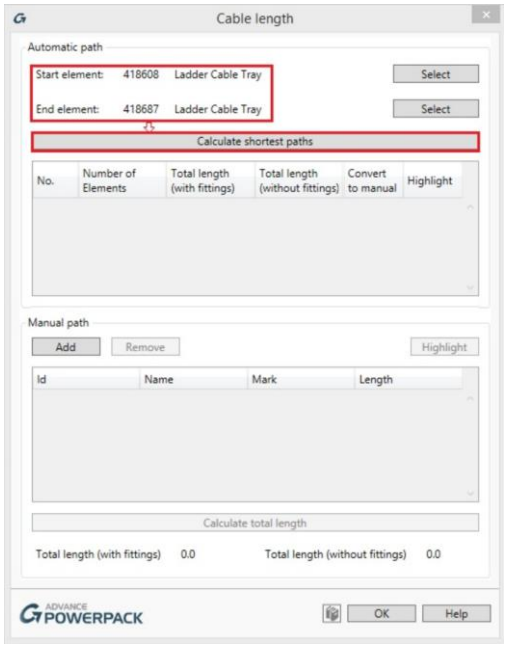
Check the box if you wish to Apply insulation to fittings. However, this is applicable if and only if all other elements in the system have the same insulation thickness. Click on the OK button to apply insulation to previously set elements. You can check the added insulation in the Properties Browser:



9.3 Cable Length

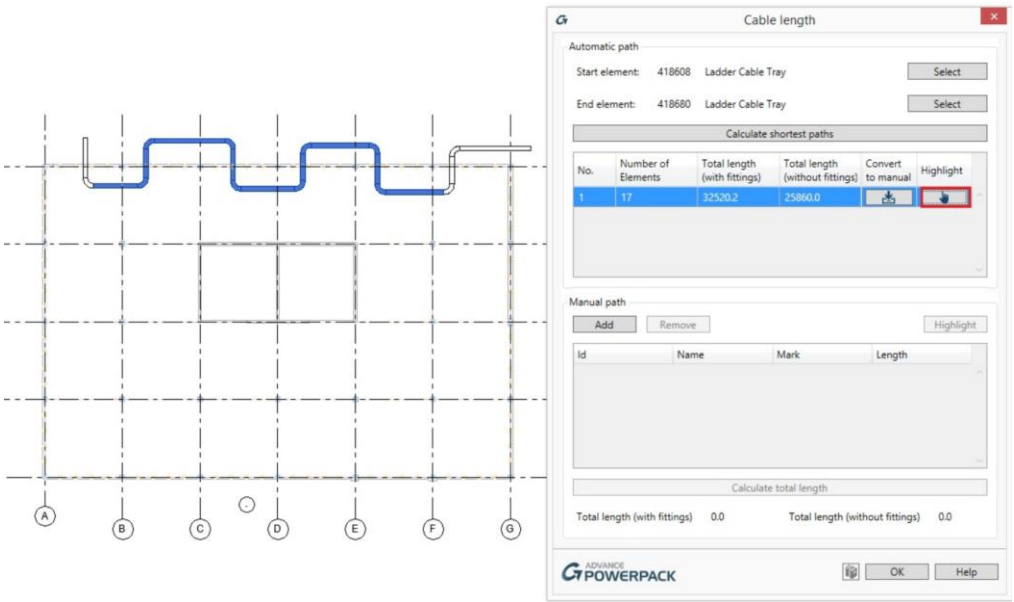
The Cable Length command part of Graitec PowerPack for Revit calculates the cable length of the selected path.

A dialog box opens when clicking on the Cable Length icon in the Ribbon. First choose the **Start** and **End element**, then press **Calculate shortest paths**.

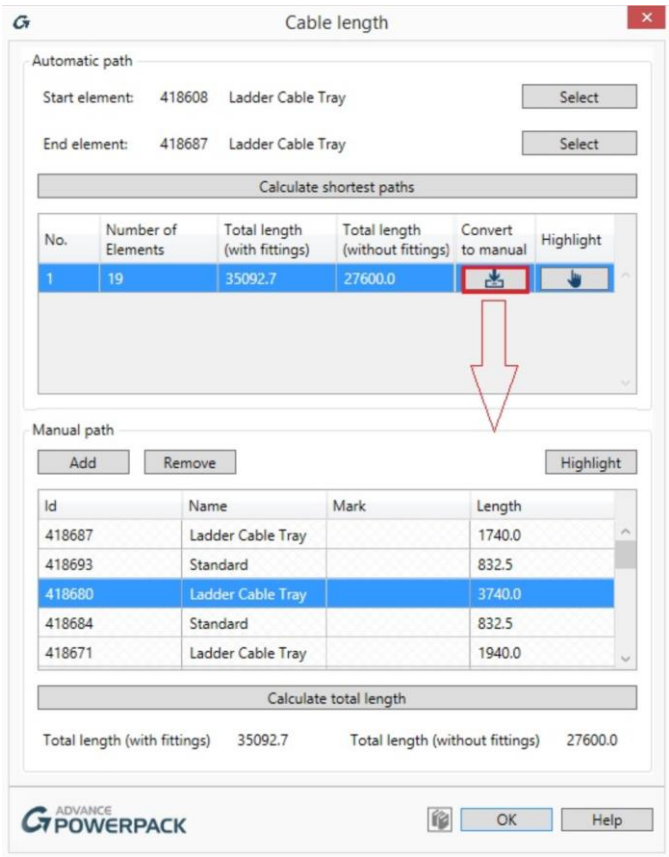


After Revit calculates the path it will display the Number of Elements, the Total Length (with and without fittings) and gives you 2 options:

Highlight, to show the calculated path including cable trays and fittings

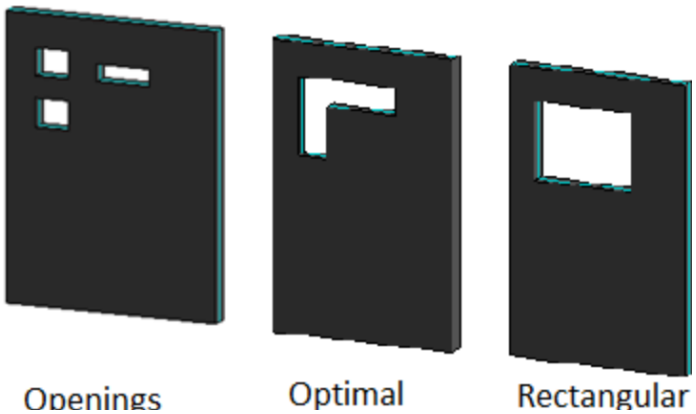


Convert to manual - by pressing the button the list of elements will be displayed giving you the option to **Highlight, Add** new ones to the path or **Remove** the unnecessary and recalculate the total length. The **Total length (with and without fittings)** is displayed in the dialog box



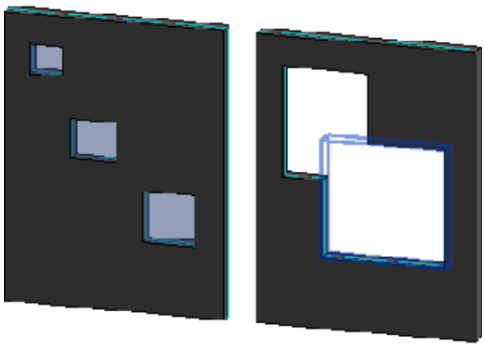
9.4 Join Openings

The Openings feature part of Graitec PowerPack for Revit connects two or more selected openings from the same host. PowerPack for Revit allows you to join into Rectangular or Optimal openings.

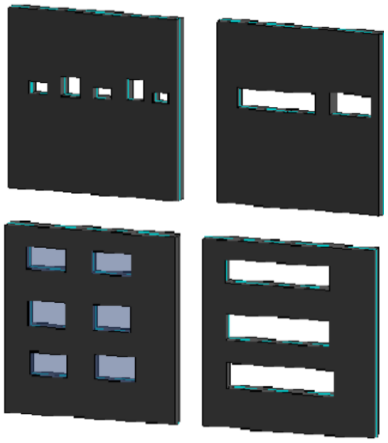


Join into Optimal Opening – This command joins selected openings and creates one or more new openings with the optimal area.

Click on the **Join into optimal opening** command and select the openings you wish to join



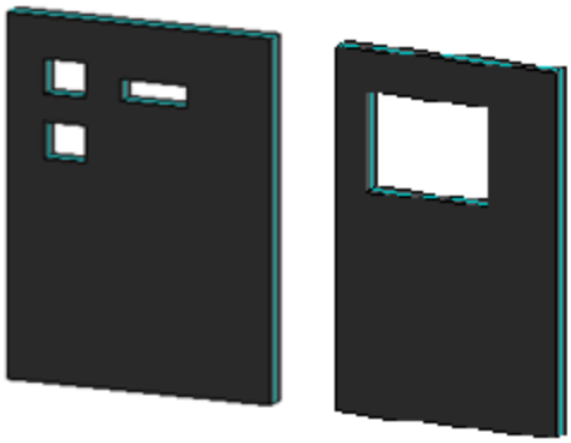
For three selected openings, the ones from the sides are connected to the middle one



One of the most useful capabilities of this command allows you to select groups of openings which are separated from each other and the command will connect them separately by combining pairs

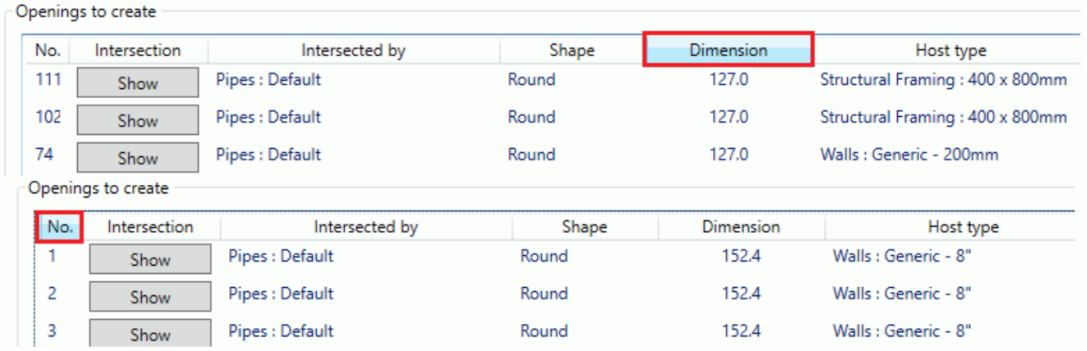
Join Into One Rectangular Opening – This command creates one rectangular opening which covers all selected openings. Boundary points from the selected openings are used to create the new opening.

Click on the **Join into one rectangular opening** command and select openings to join.

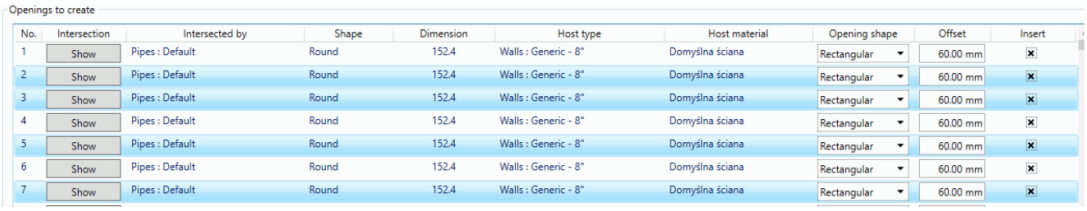


9.5 Pipe Openings

GRAITEC PowerPack for Revit comes up with a series of improvements to the Pipe Openings tool, in order to cover a wider range of situations that can be encountered. First of all, managing intersections in the Pipe Openings dialog is now easier and more user-friendly with the ability to sort columns.



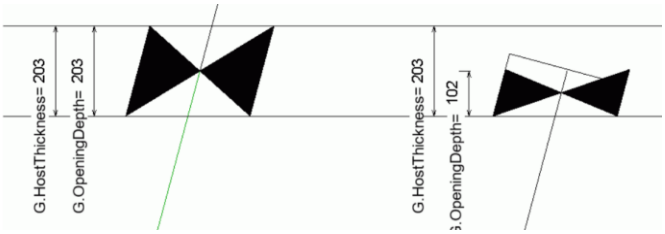
Also, multiple selection is now possible by holding the Ctrl key from the keyboard.



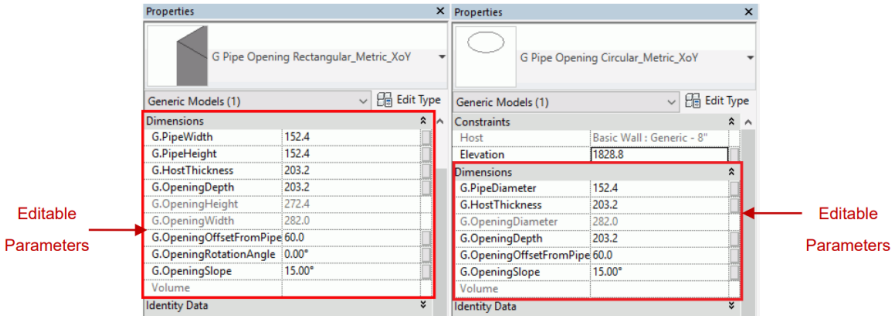
Secondly, the families used when creating the openings around the pipes (both for imperial and metric system) have been created respecting the following convention:

- G.HostThickness is the actual thickness of the host, measured perpendicular to the element
- G.OpeningDepth is the thickness of the opening, measured along the host thickness.

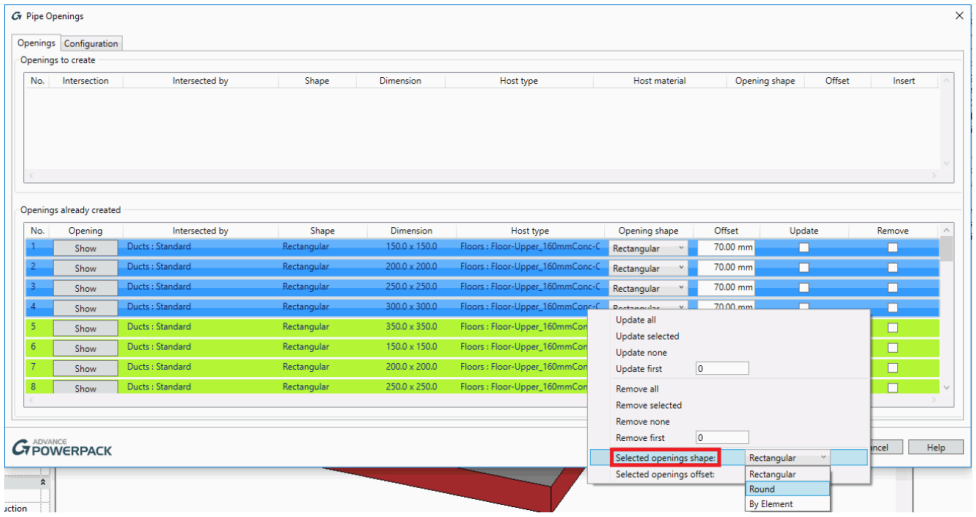
The value of G.OpeningDepth may range from 0 to the maximum value of G.HostThickness: if the cut is partial, then G.OpeningDepth is always smaller than G.HostThickness.



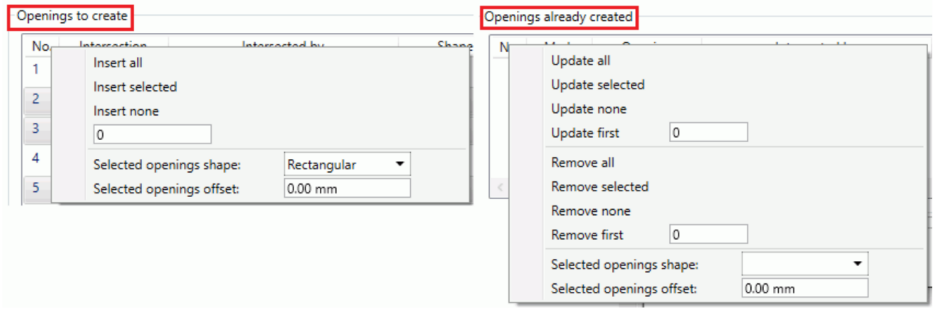
Also, the set of parameters (both the editable and the calculated, read-only ones) have been reorganized to be displayed in a more suitable manner according to their purpose:



A new options menu has been added, that allows the user to globally change the opening shape, adjust the offset, update or remove all the openings in the project.



The global selection dropdown lists are enabled when right-clicking the header of both the “Openings to create” and “Openings already created” grids.

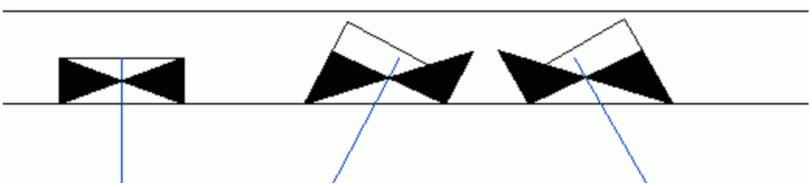


The available options are similar and include:

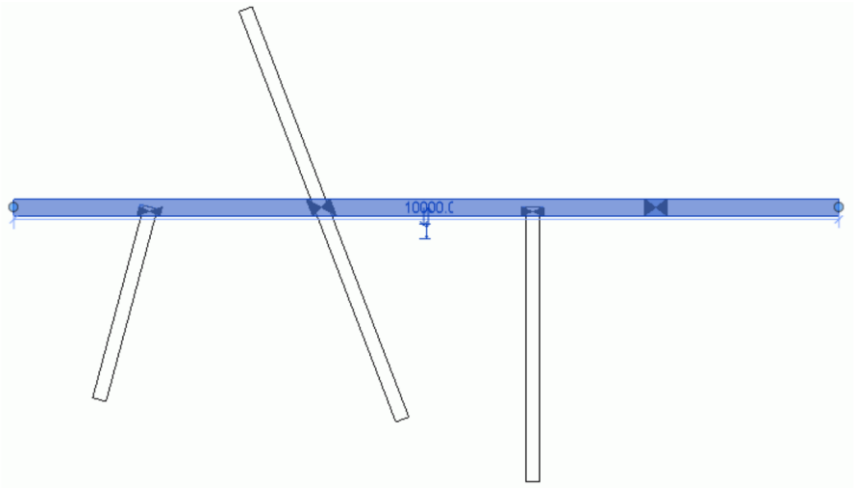
- Insert/Update/Remove All -> this setting will be applied to all the intersections detected in the project
- Insert/Update/Remove Selected -> this setting will be applied only to the selected intersections from the project
- Insert/Update/Remove None -> this option clears the previous settings performed to the intersections from the project
- Insert/Update/Remove First -> the settings will be applied starting with the specified intersection from the project

The global selection also includes the possibility to set a unique opening shape or offset for the intersections included in one of the selection methods from above.

Another major improvement is the fact that the Pipe Openings tool has been updated to detect if a building element is only partially intersected and create opening according to the intersection.

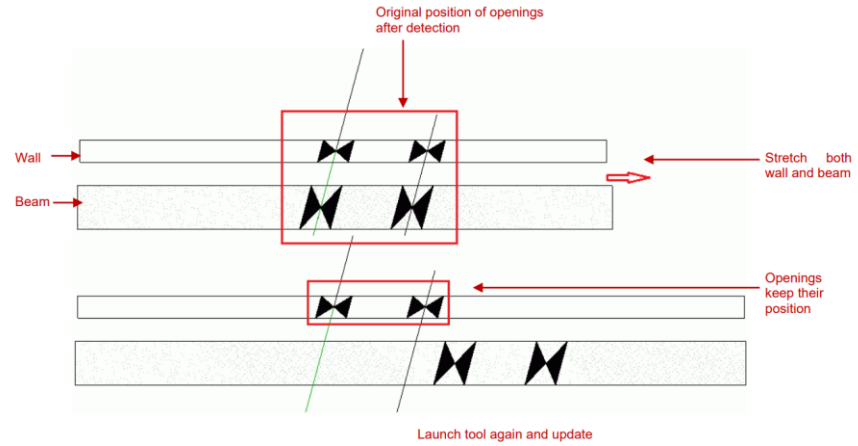


In the previous version of the PowerPack, the tool only recognized pipes that were slanted in a vertical axis system; now the openings are created for elements that are sloped in the x/y axis system.

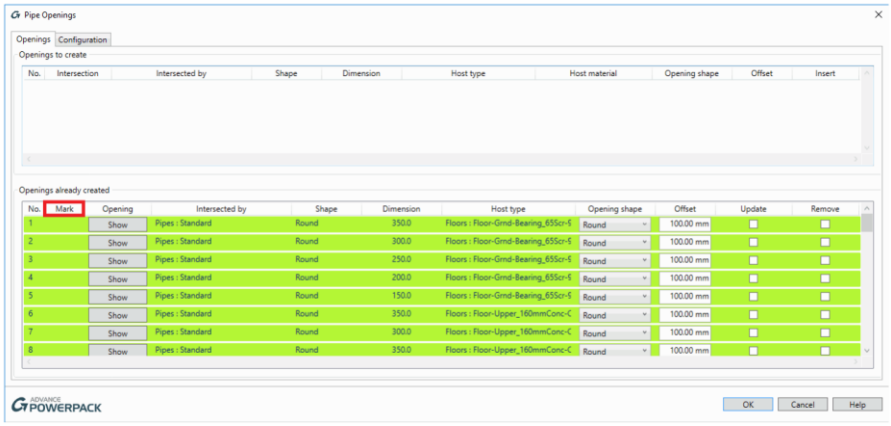


There is a fundamental difference between the way the command can be applied for MEP elements intersecting walls and beams. Once generated in a wall, openings will be stretched/moved along with the host element.

For a beam, after stretching the host element, the tool needs to be launched again for the opening positions to be updated.

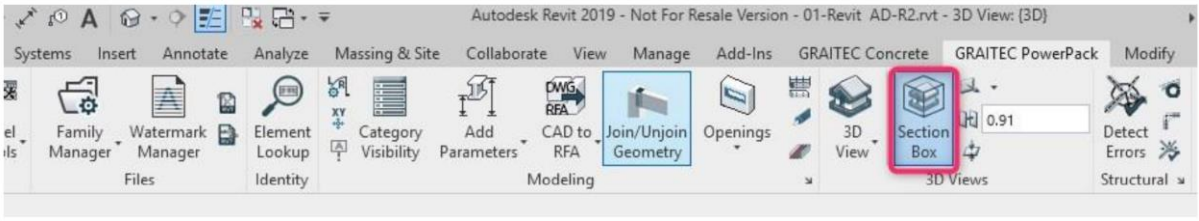


A new column was added to the grid from the dialog allowing the user to sort pipe openings based on their Mark.



10 3D View Tools

The 3D View command part of Graitec PowerPack for Revit can be used for automatically generating 3D Views.

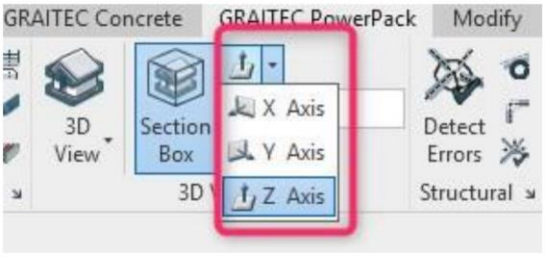


There are 4 main areas covered by this tool:

1. **Section Box** – give the user the ability to use a section box in real-time
2. **Levels Displacement** – helps the user slit the 3D view by levels
3. **3D View for Each Level** – automatically creates a 3D view for each building level
4. **Auto Section Box** – automatically creates a 3D view of the selected objects

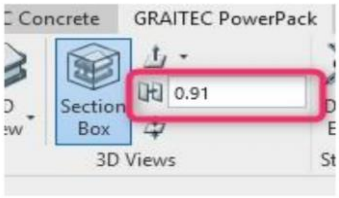
10.1 Section Box

The **section box** extends in real-time with a simple mouse scrolling. In a 3D view user can activate Section Box tool simply by clicking on it under 3D Views tab. Once activated the user can choose the desired plane to cut through X, Y, and Z. By clicking on drop-down icon (Z plane is on by default)



After selecting the desired plane hold Ctrl+Middle Mouse Button (MMB) to swiftly cut through the plane

Users can define the cutting step for the section box, by determining the value in Cutting Step box. By default, it uses project units, but symbol units are recognized by the command (m, cm, mm etc.) as well.

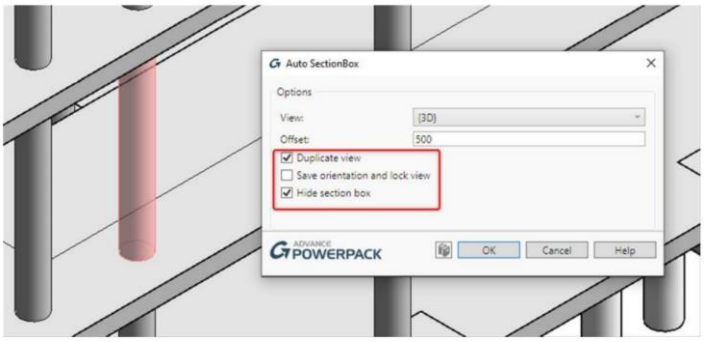


In addition to that, the new section box tool gives user flexibility to Reverse Plane with a single click, cutting the section in inverse direction.

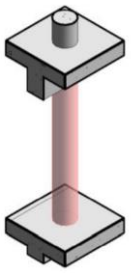
With Section Box tool, modelling becomes easier and efficient, giving users more flexibility and control over the model in real-time.

10.1.1 Auto Section Box

Auto Section Box command adds new options in order to automatically duplicate the view, save orientation and lock the view, and Hide the section box.



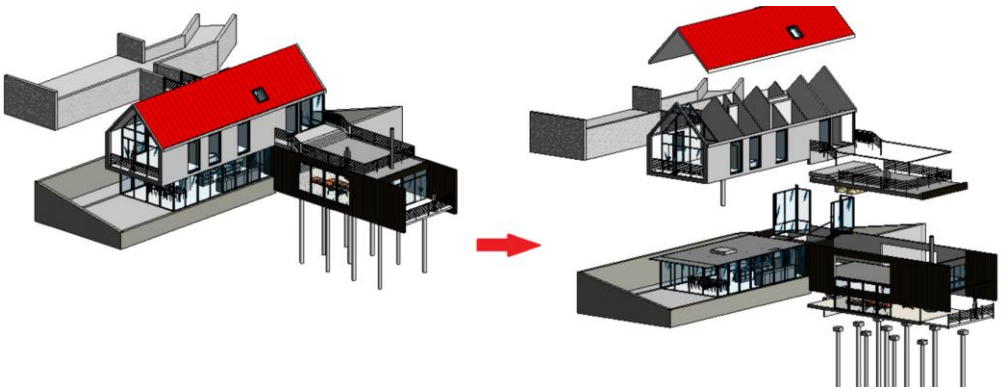
Result:



10.2 Level Displacement

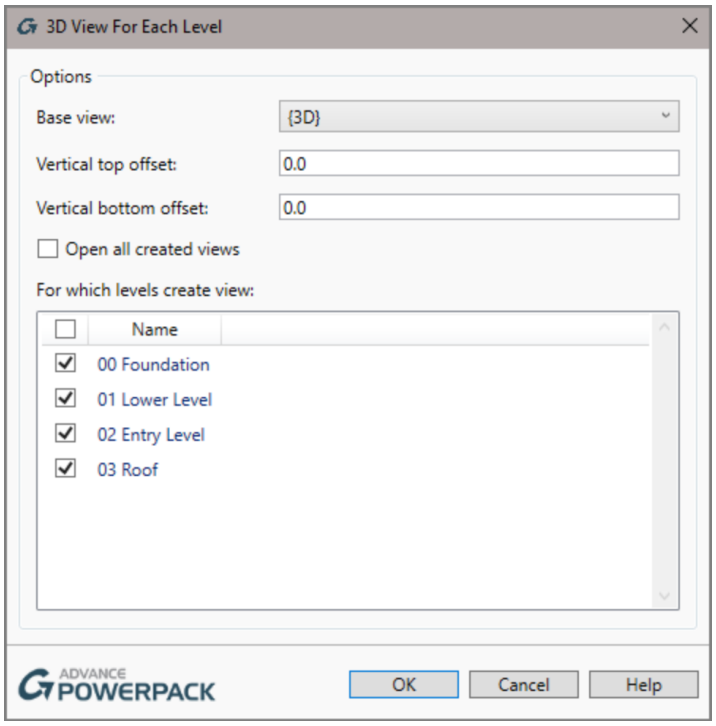
The Levels Displacement command part of Graitec PowerPack for Revit splits the full 3D view of the building by levels.

Click on the Levels Displacement icon to automatically explodes the 3D model on each level. The displacement is done automatically and can be visible in the 3D View. It shows what is happening inside the model, what elements are hosted by each floor and how different interior spaces interact in the model. A level displacement view shows almost all the information in your model, from structural elements to the floor/wall finish of a room.



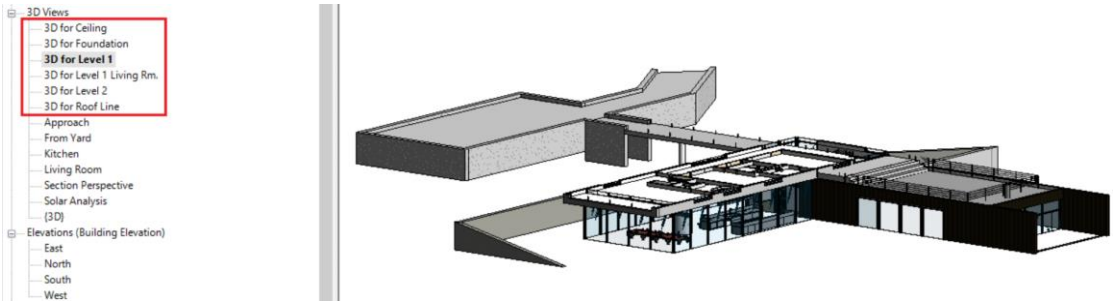
10.3 3D View for Each Level

The 3D View for each Level option command part of Graitec PowerPack for Revit automatically creates a new 3D view for each building level. Click on the 3D View for each Level option to open the dialog box:



1. Select the Base View you want to use for generating 3D Views, pick between Default or 3D
2. Enter the Vertical top offset and the Vertical bottom offset
3. Select the option to Open all created views and pick for which levels you want to create views

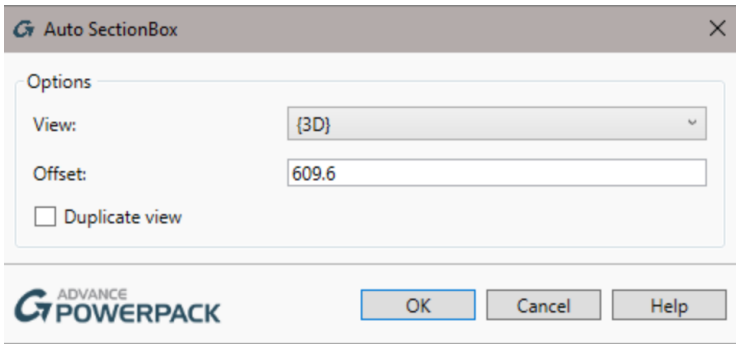
The 3D View for each Level option creates a section box for each level with a custom view range, giving the user the possibility to view the interior of the model in a 3D representation. The new 3D views created are basically section boxes around the model. Click OK and check the new views created in the Project Browser:



10.4 Auto Section Box

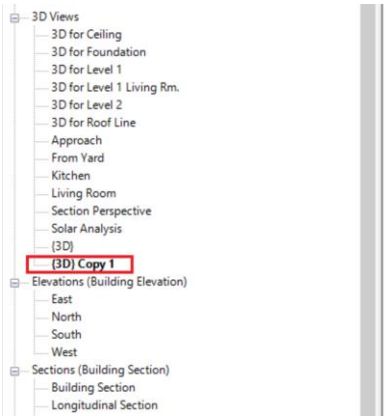
The Auto Section Box command part of Graitec PowerPack for Revit automatically generates a 3D view for the selected objects. Firstly, click on the **Auto Section Box** icon to activate the feature, run the command in a plan view.

Select multiple elements on the 3D model to create section box around them. Once elements have been selected click finish on the options bar to open the settings dialogue



1. Pick the **View** you want to use for creating the new 3D view, this will use the visibility setting for that view
2. Enter the **Offset** distance
3. Select the **Duplicate view** to avoid overwriting the complete 3D view

Click OK and check the new 3D view, automatically created in the Project Browser.


3D Views
3D for Ceiling
3D for Foundation
3D for Level 1
3D for Level 1 Living Rm.
3D for Level 2
3D for Roof Line
Approach
From Yard
Kitchen
Living Room
Section Perspective
Solar Analysis
{3D}
{3D} Copy 1
Elevations (Building Elevation)
East
North
South
West
Sections (Building Section)
Building Section
Longitudinal Section

11 Annotation Tools

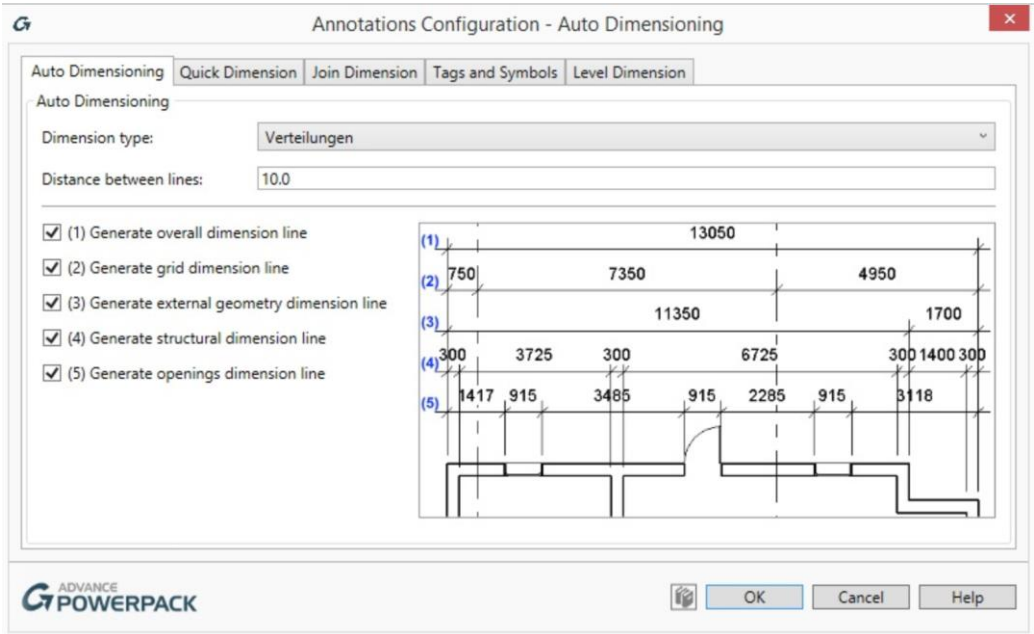
The Annotation category part of Graitec PowerPack for Revit contains features for generating dimension lines, displaying layers of a floor in views or calculating the centre of gravity of selected objects.

The Annotations tool set contains the following commands:

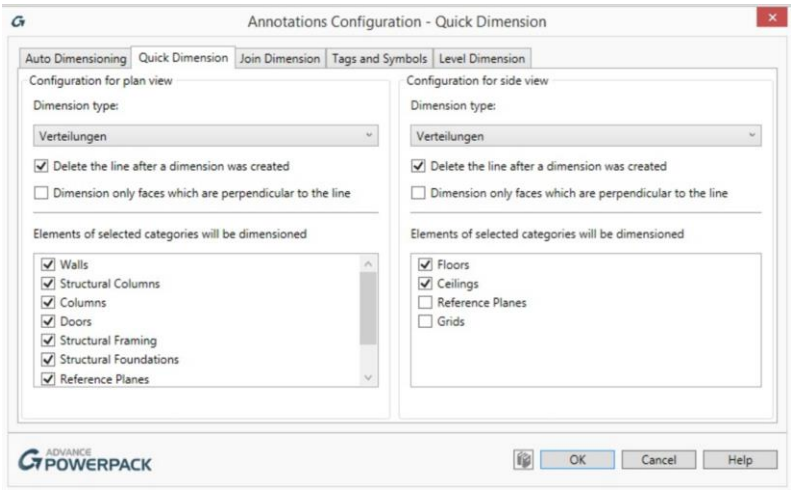
- **Numbering**, reorganises or removes a numbering sequence from any loaded category from the project.
- **Auto Dimensioning** allows you to automatically generate dimension lines for external walls
- **Quick Dimension** allows you to create a dimension line on basis any model line.
- **Join Dimension Lines** allows you to join several selected dimension lines into a single dimension line.
- **Level Dimensions** allows you to automatically place level dimensions within a vertical section.
- Using the **Tags and Symbols** command, all the layers of a floor can be displayed in views or sections by a single click.
- The **Window Sill** command is used to place a tag with the height of the sill and window width.
- The **Stair Line** command helps you create the stair line for a stair defined by a sketch.
- The **Center of Gravity** command calculates the center of gravity for the selected volume objects in Revit ® and displays it in the 2D views.
- The **Pipes Description** command automatically adds tags and annotations for Ducts and Pipes categories.
- The **Text Case** tool allows the user to adjust the case for a selected text or to convert all texts from upper case to lower case and vice versa.
- **Edit Mark** modifies the syntax of positions for the selected elements.

The **Annotations Configuration** dialog (accessible by clicking the corner arrow of the Annotations panel) allows the user to define how to use the dimension options.

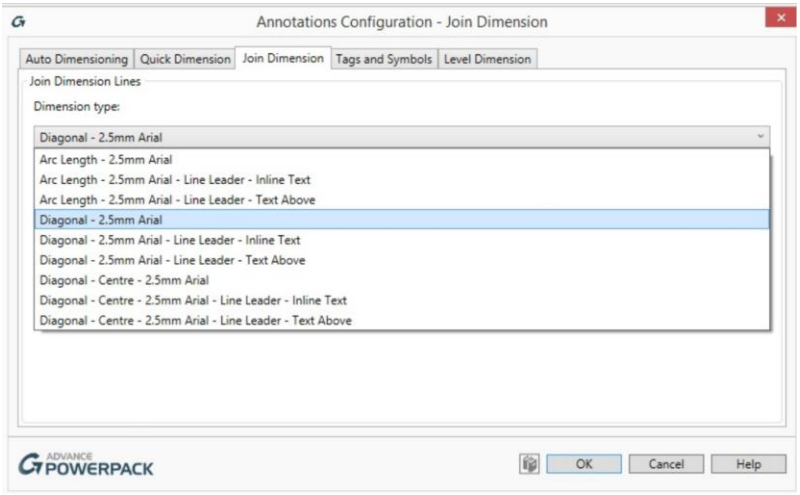
To use the **Annotation Configuration**, click on the small diagonal arrow icon. In the Dimensioning tab the user can set the types of dimension lines and the distance between dimension lines for **Auto-Dimensioning**



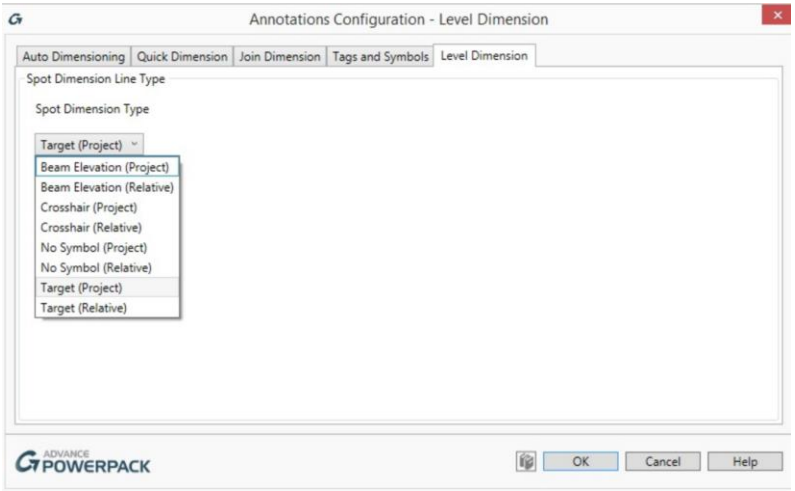
In the **Quick Dimension** tab, the user can set the configuration for plan view and side view and select which elements will be dimensioned in either view:



The **Join Dimension** tab is used for setting types of dimension lines for Join Dimension Lines

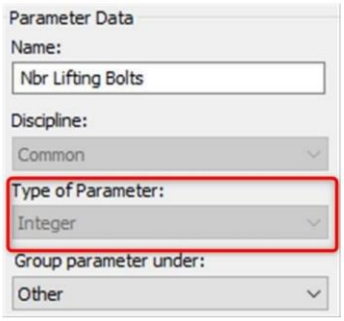


The **Level Dimension** tab, is used for setting the types of spot dimensions.

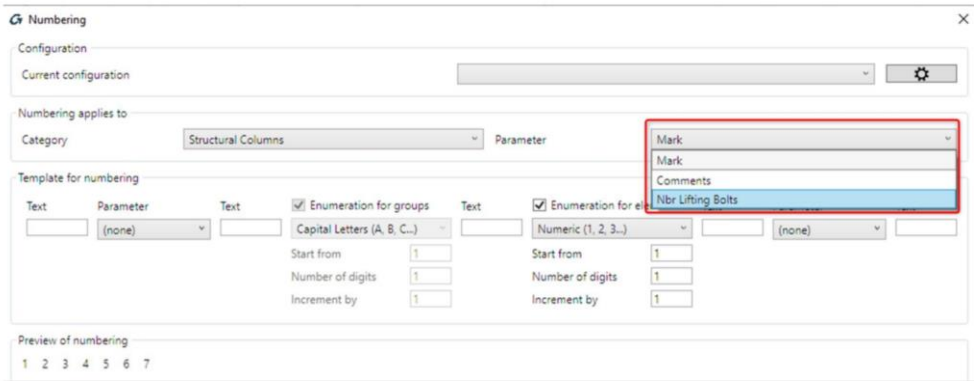


11.1 Numbering

The numbering command can automatically number parameters defined as Text in Revit. This command was extended making it possible to work with parameters defined as an integer in Revit.

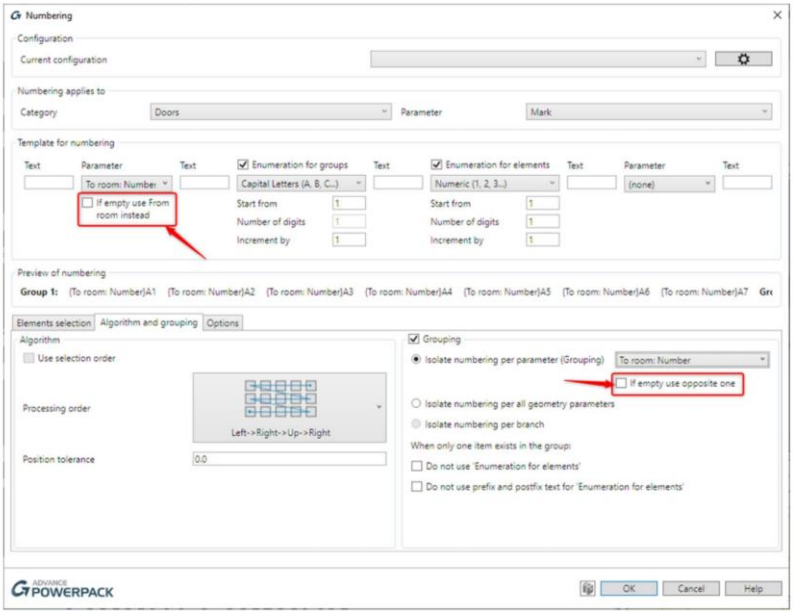


We can see in this example of a new project parameter created and defined as Integer, this type of parameters is now visible in the combo list of parameters available for the numbering command.



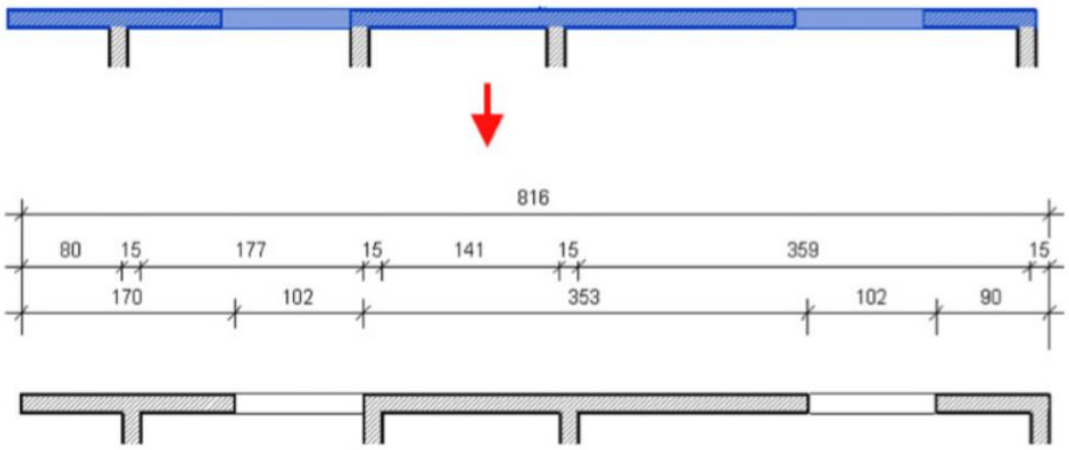
11.1.1 Numbering Grouping for Doors

The Numbering command has a new option in the Grouping section for "To room: Number" to use “from room” in case it is empty. This feature removes the limitation the tool previously had to number the exterior doors first.



11.2 Auto Dimensioning

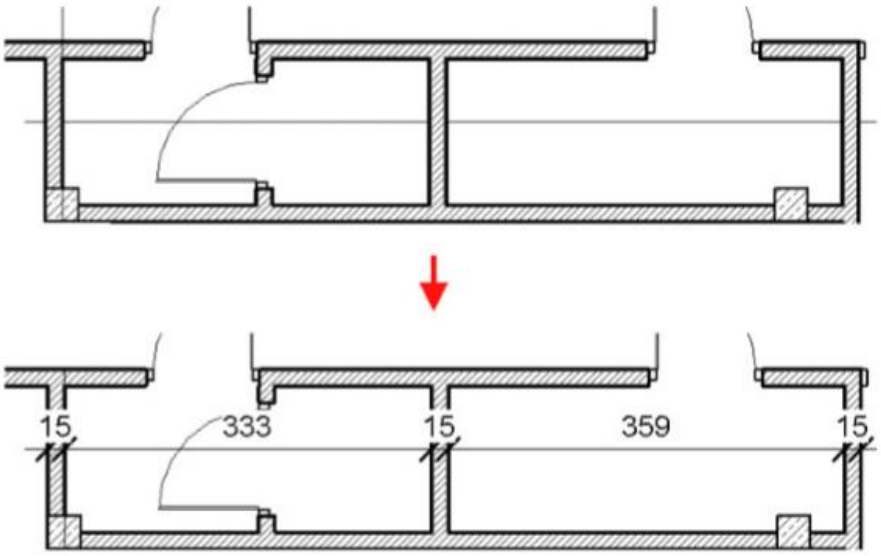
The **Auto Dimensioning** command will add several chains of dimensions to a selected wall or grid. First select the wall that requires dimensioning to activate the comment:



Auto Dimensioning command also supports beams and columns.

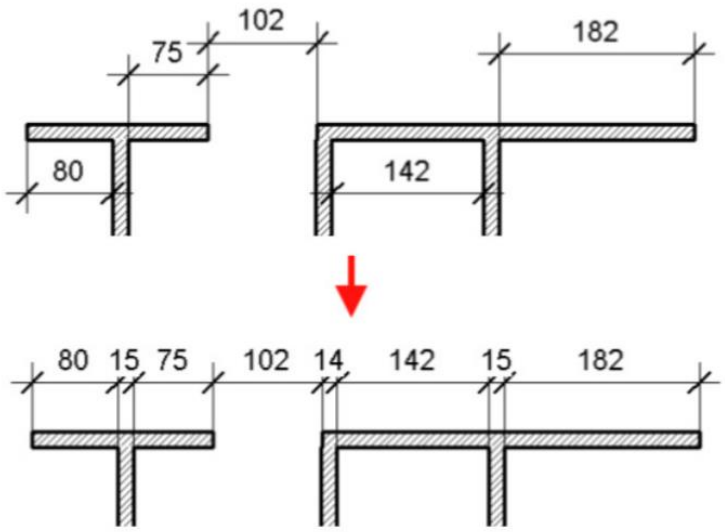
11.3 Quick Dimension

Quick Dimension will convert a detail line to a chain of dimensions. First select the icon, then select the detail line. Note: this command does not work with model lines.



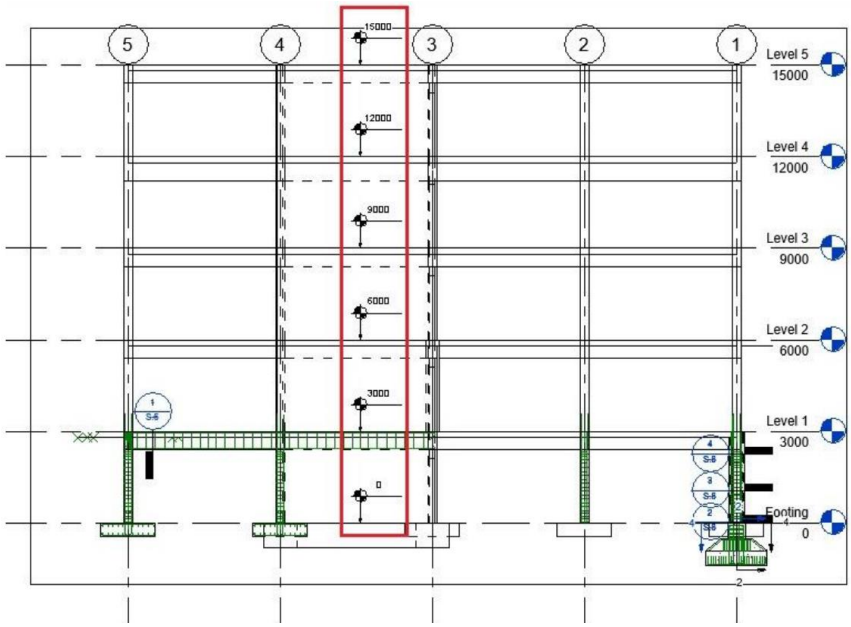
11.4 Join Dimension Lines

Join Dimension Lines command allows the user to select a series of individual dimensions, and group them into a single chain. This will automatically align the dimensions and add any missing dimensions. To use the command, select all dimensions that require adding to the chain. The first dimension the user selects will define the position of the chain.



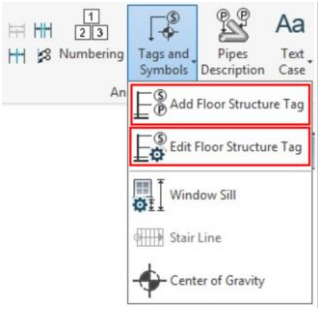
11.5 Level Dimensions

Automatically generate Level Dimension within a vertical section. Press the button located in the Annotation category and click the point where the dimensions will be placed.



11.6 Tag and Symbols

There are sever Tag & Symbol tools within the same icon (below) – this will expand to present you will additional tools.



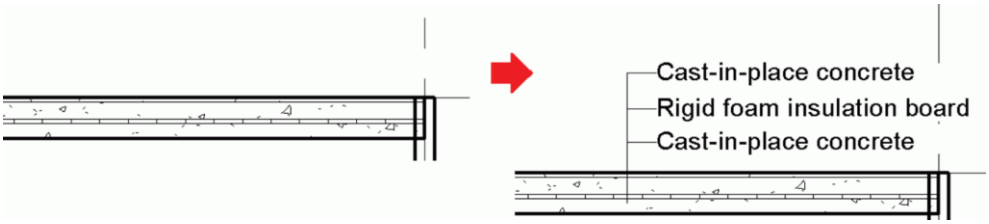
These tools include the following:

- Add/Edit Floor Structures Tag
- Window Sill
- Stair Line
- Centre of Gravity

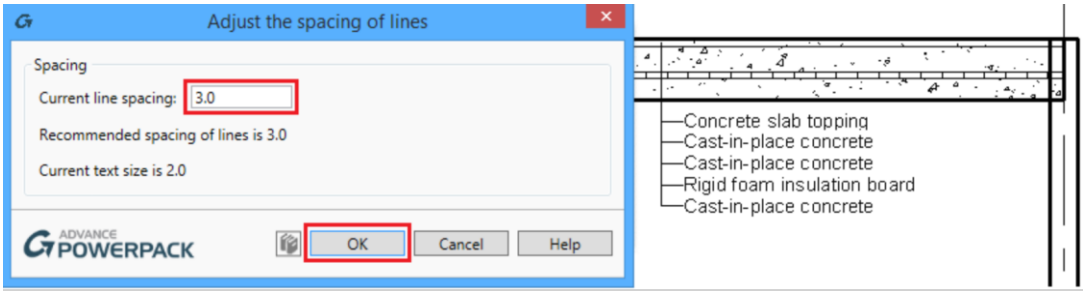
11.6.1 Add/Edit Floor Structures Tag

The Add/Edit Floor Structure Tag commands part of Graitec PowerPack for Revit can be used to add or edit floor structure tags inside the project.

The Add Floor Structure Tag command can be accessed from a section/elevation view only; once activated, it will display the layers of the currently selected floor, based on the materials that are used, from the bottom layer (ex. structural layer) to the top layer (ex. finish layer)



The space between the labels can be modified using the Edit Floor Structure Tag option, for example, when the view scale is changed. If necessary, the text from the structure tag can be overwritten.

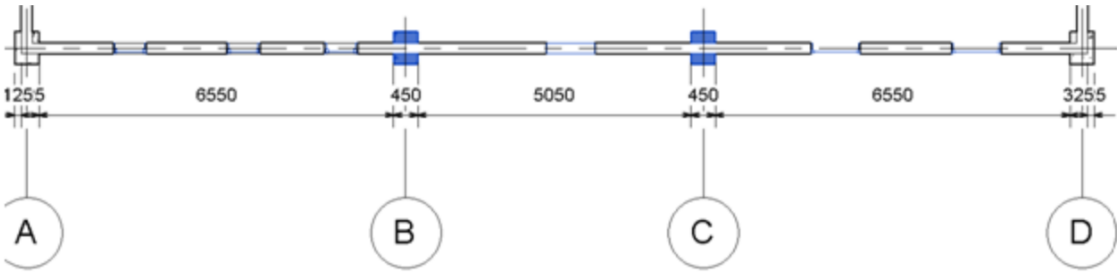


11.6.2 Window Sill

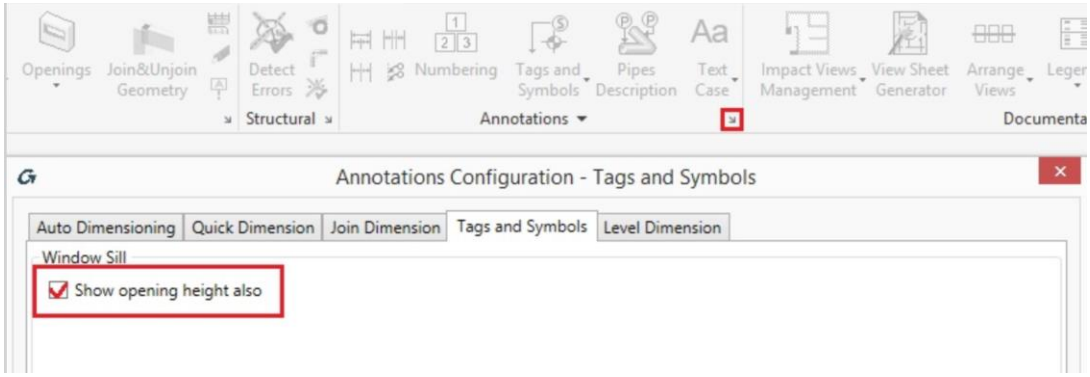
The Window Sill command part of Graitec PowerPack for Revit can be used for placing a tag with the sill and opening height.

Creating the window sill label in a project is highly recommended. It shows the height from where the opening starts. The Window Sill function displays a tag with the height of the parapet in front of the opening, placing the value between brackets. The command is found in the Tags and Symbols drop-down list.

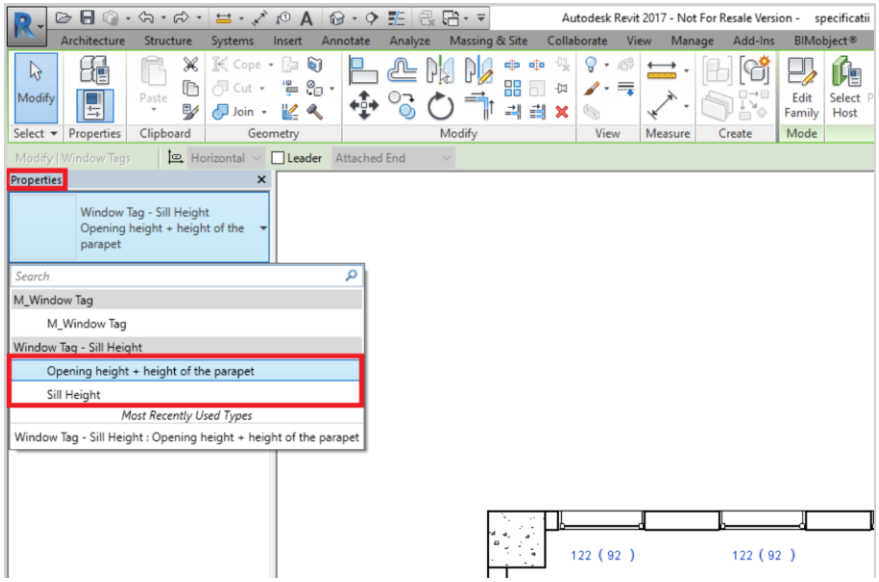
Using the window selection, select all the windows you want to tag and use the Window Sill command.



The tool can also show the height of the window, by accessing the annotation configuration arrow in the bottom right of the Annotations tab and checking Show opening height also an option in the Tags and Symbol tab.



Alternatively, you can simply select the sill height in brackets, and in the Properties, dialog select the annotation type Opening height + height of the parapet

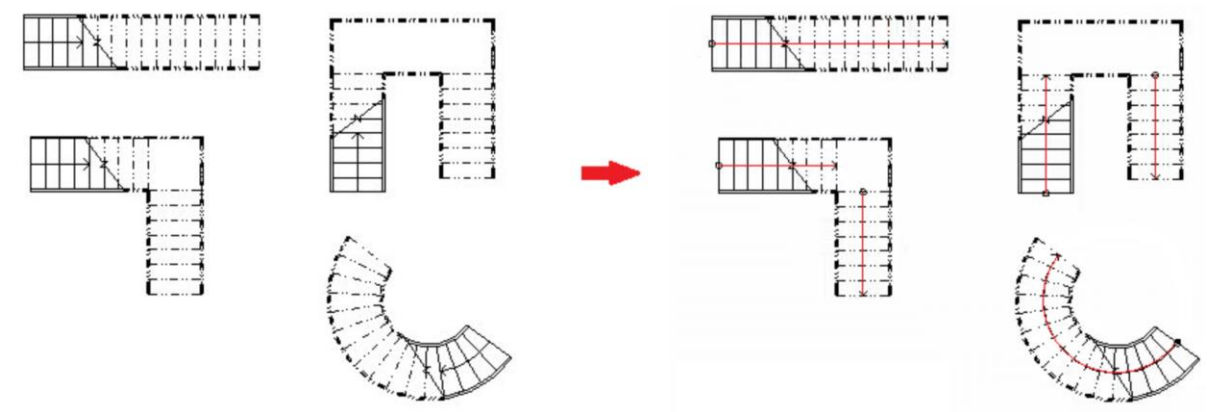


11.6.3 Stair Line

The Stair Line command part of Graitec PowerPack for Revit can be used for creating the stair line for a stair defined in a sketch. After drawing a stair by component or by sketch, Autodesk Revit will place a stair line only up to the first riser cut by the horizontal plane in a floor plan view, depending on the view range of the plan section.

The Stair Line tool creates the same stair line that will follow the shape of the stair, and it only works properly if the stair is drawn by sketch.

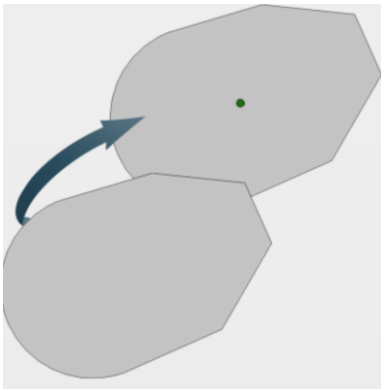
Click on the Stair Line command and make a window selection of the stair by sketch, the run of the stair should show a new stair line that goes up to the last riser. The stair line will follow only the actual runs of the stair and will not appear on landings (if the stair has one or more landings).



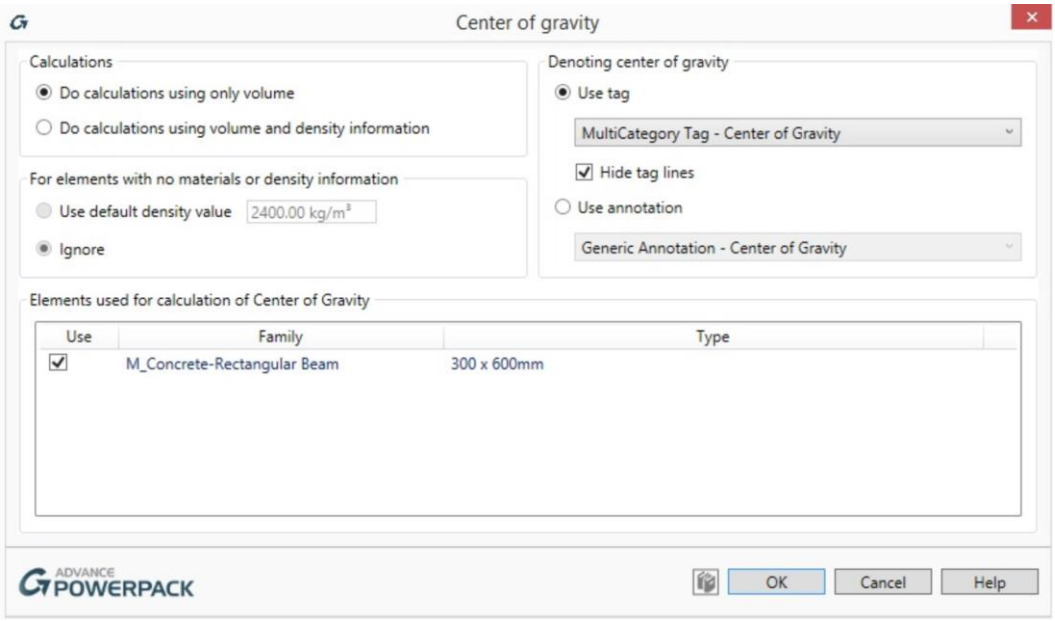
11.6.4 Centre of Gravity

The **Centre of Gravity** command part of Graitec PowerPack for Revit calculates the centre of gravity for selected single or multiple elements and displays it in the project using a tag or an annotation symbol. The centre of gravity is calculated using volumetric data, or combined density data.

This tool can calculate the centre of gravity for the selected volume objects in Revit® using only volume or using available density information of the materials used in elements (ex. walls, floors, etc.).



After selecting an element or multiple elements in the view and finishing the command, a pop-up window will appear, allowing you to select calculation rules, view a list of the elements you have just selected, and change the tags that appear in your current view.



Centre of gravity can be calculated using only volume or using available density information for the materials used in elements.

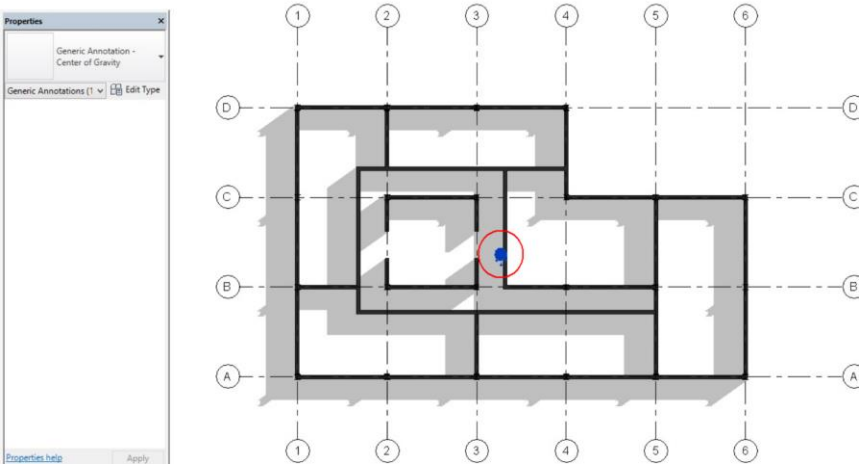
- **Calculate centre using only volume** - the centres for selected elements are calculated as centroids – ignoring density information.
- **Calculate centre using available density information** - the centre of selected elements are calculated using density information (if available) from materials assigned to them

When calculating elements using density, elements with missing density information can have a default density set by user or can be ignored.

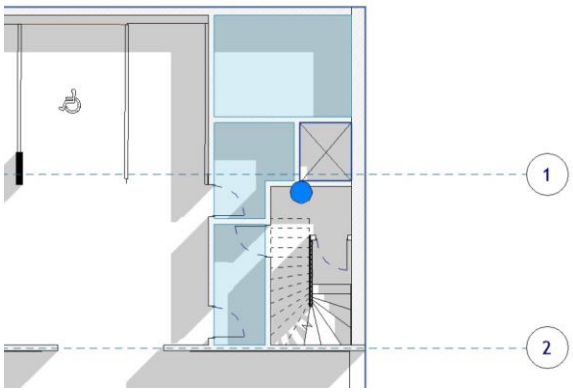
- **The Set default value** option allows you to set a default value of density for elements [2400kg/m3 – default for concrete].
- The **Ignore** option is needed if you choose to ignore elements or element components without density information. If all selected elements have no density information and this option is selected, a message box appears to warn that no elements have density information and the centre is not calculated.

The centre of gravity can be indicated by using a tag or annotation. The **Use Tag** button enables the user to load and use a custom Multi-Category Tag

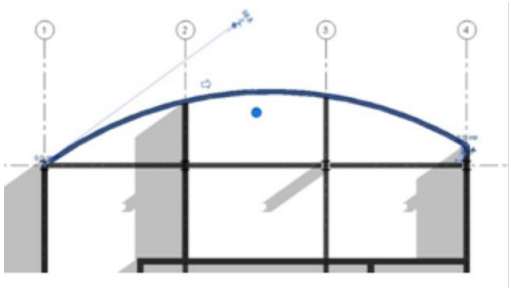
- The **Hide tag lines** option hides or shows tag lines.



Centre of Gravity – multiple elements:

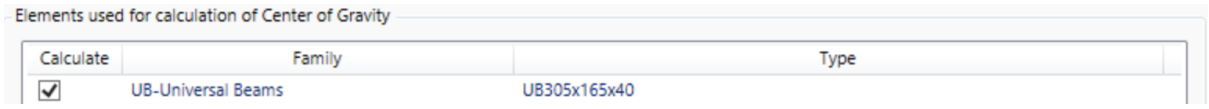


Centre of Gravity – single elements:



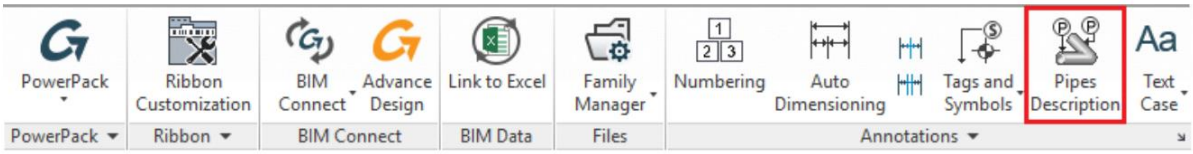
The Use annotations enables you to load and use a custom generic annotation.

This list shows information about selected elements (Family and Types) with the option to exclude them from calculations after unchecking the Calculate check-box.

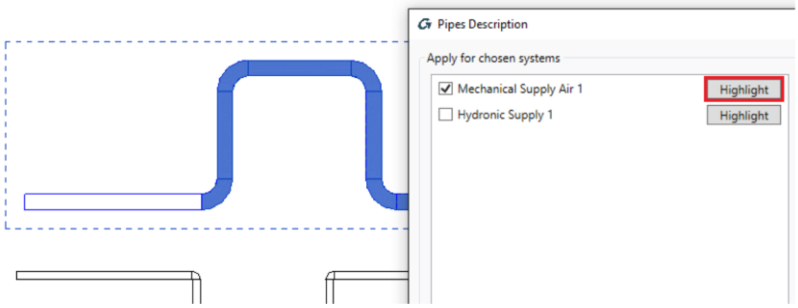


11.7 Pipes Description

Other developments applicable for MEP projects available in this version of the PowerPack include the ability to automatically add tags and annotations for Duct and Pipe categories.

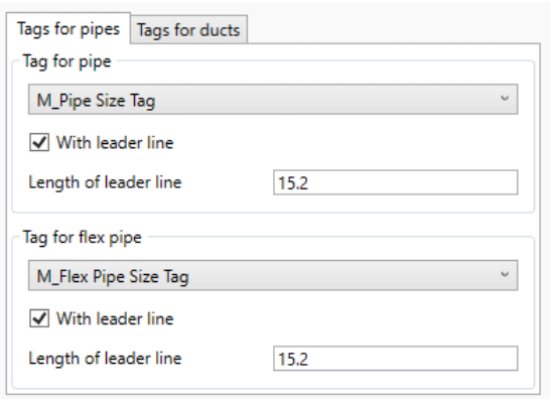


The “Pipes Description” tool automatically detects the systems in the project and, with minimum effort and settings from the user, annotations can be generated keeping a fixed position or spacing between them in order to obtain a clean and organized final view. Please be aware that this tool only works in a (3D view ,plan, section, and elevation).

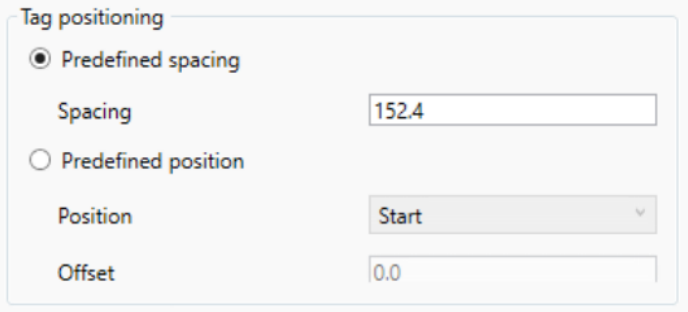


In order to better manage the systems of large projects, the user has the ability to choose which elements to generate annotations for and highlight them in the view.

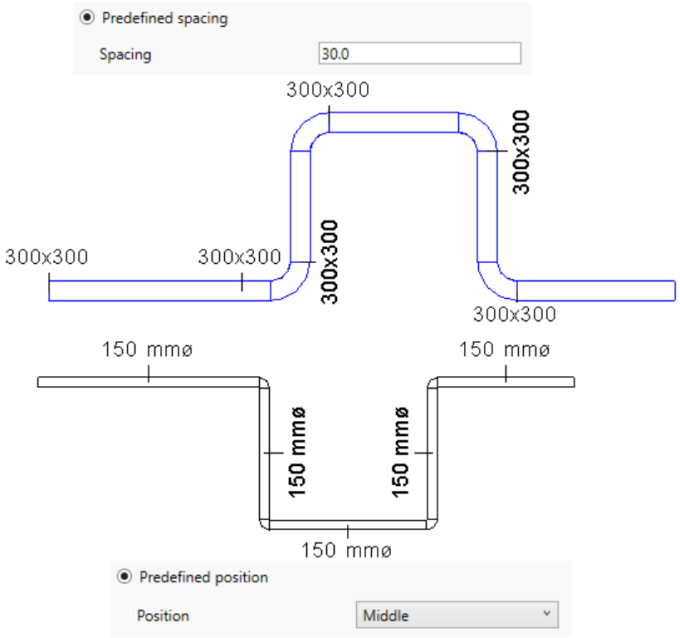
The tool is applicable for pipes and ducts, regardless of whether they are rigid or flexible. Both categories have tabs where the user can decide the configuration of the tags that are to be inserted independently



Additionally, a unique option to control the actual placement of the tags is included. For each category, the user has the ability to choose to place the tags either at a fixed distance or at a fixed point (start, middle, or end of the segment).

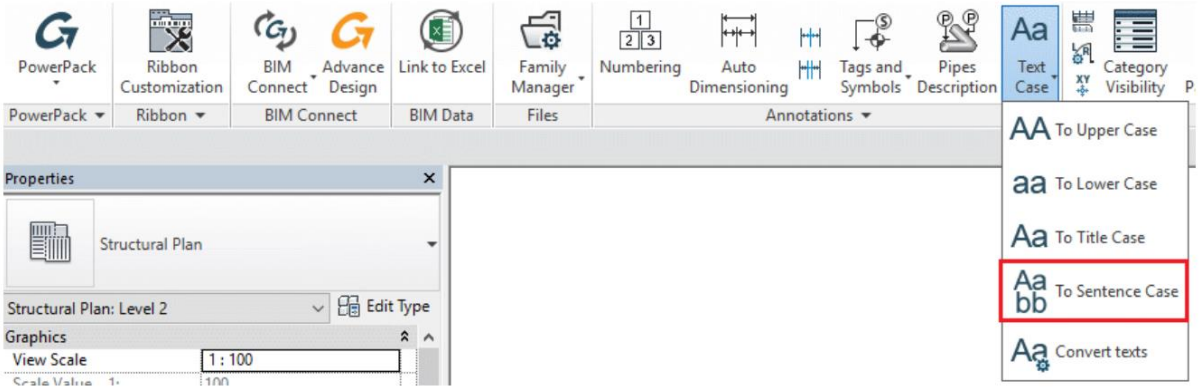


The position of the tag will be the same for all selected elements, meaning that running the command several times with different settings applied can generate different results for different elements belonging to the same project.

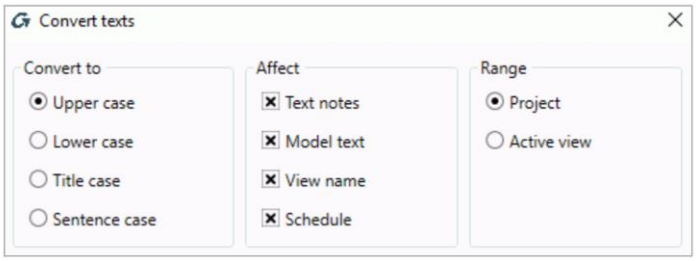


11.8 Text Case

The existing “Text CASE” tool has been enhanced to include the ability to automatically change text to sentence case: for each sentence detected, the first letter will be capitalized.

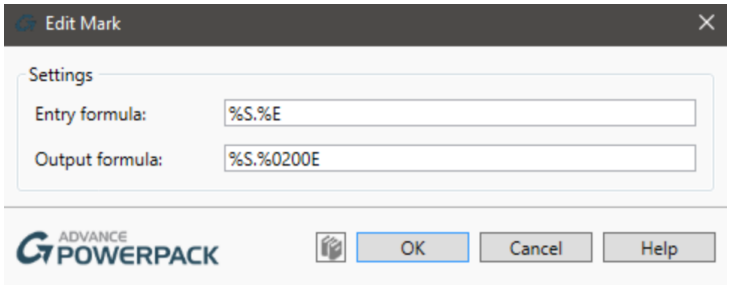


The tool can be used to adjust the case of selected text or convert all text from one type to another. The functionality has been extended to also cover the case of views, sheets and schedules.



11.9 Edit Mark

The **Edit Mark** command modifies the syntax of positions (‘Mark’ parameter) for the selected elements. For example; some elements have the 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, and 4.4 as a Mark number. Select the elements and run the Edit Mark command. The following dialog box will appear:



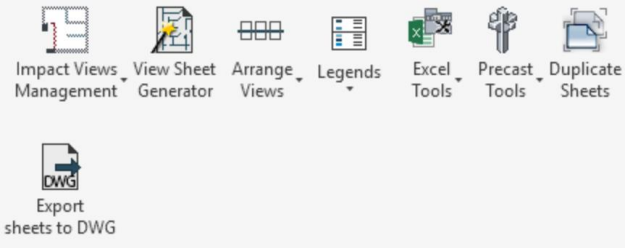
The **Entry formula** %S.%E equals the current Mark number 3.1 (S=3; E=1), so only elements with matching position numbers will be modified.

The **Output formula** shows how the numbering will be delivered. If you want a numbering pattern such as 13.201, 13.202, 13.203, etc. the Output should be in %10S.%200E form.

If you want a numbering pattern such as 3.01, 3.02, 3.03 etc. the Output should be %S.%00E form. Another example for the Output formula is Beam %S, which will deliver Beam 12.

12 Documentation Tools

The Documentation category part of Graitec PowerPack for Revit contains features for managing impact views, arranging views, duplicating sheets, calculating cable length and connecting an Excel Sheet to your project (This tool has been moved to the BIM Data tab in the latest realise), among others.

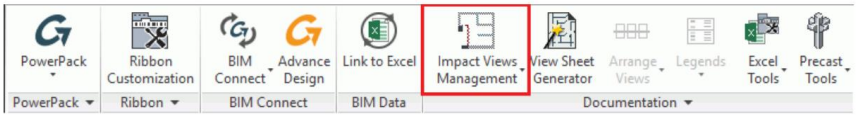


The following commands are available in the Documentation category:

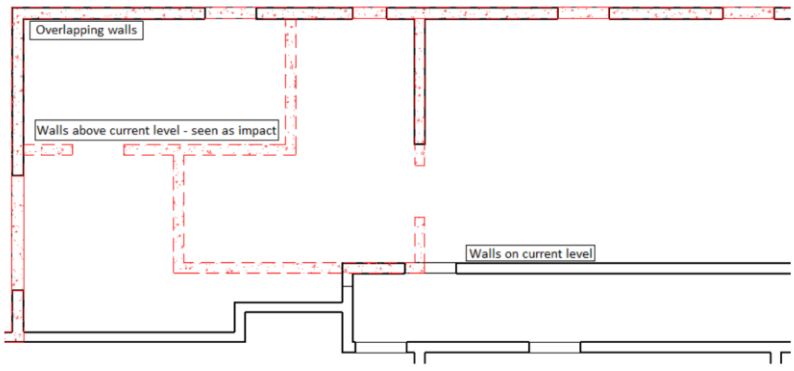
- **Impact Views Management** allows you to automatically obtain formwork drawings including all the required details.
- The **View Sheet Generator** command automatically creates a set of views for a selected assembly. Multiple selections of several assemblies are also allowed. Select the assembly for which you need to generate a sheet and run the command.
- The commands in the **Legends** category enables you to automatically create legends and update them whenever it is necessary.
- **Precast Tools** are used for managing precast concrete elements – assemblies
- **Duplicate Sheets** allows you to rapidly duplicate the sheets
- **Export sheets to DWG** helps you export Revit sheets to DWG format
- **Arrange Views –** Arranging views in the Sheet

12.1 Impact View Management

Formwork drawings, including all the required details, can now be automatically obtained with a minimum effort and a lot of time saved by using the “Impacts Views Management” concept available in the GRAITEC Advance PowerPack for Revit® .

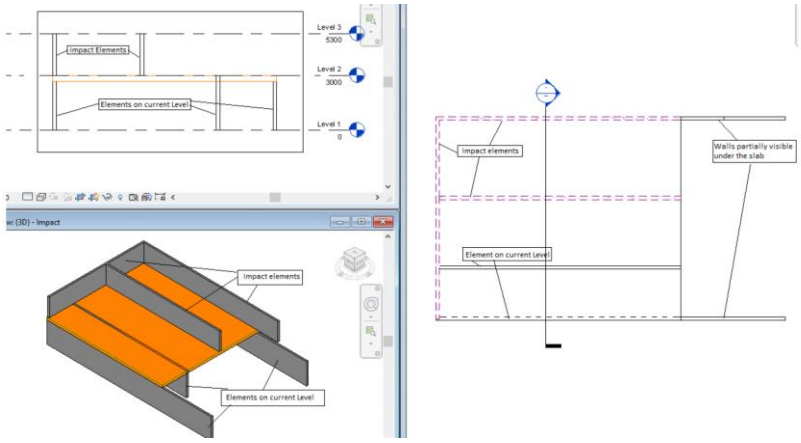


This tool produces instant good quality drawings, eliminating the tedious, time-consuming manual workflow of customizing different settings and representations for all categories of elements used for Revit projects.

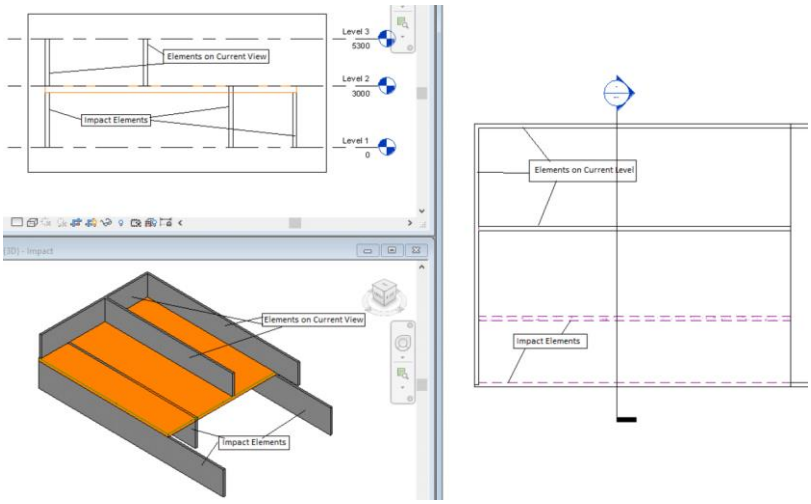


The whole impact process was designed to be applicable for multiple situations, so the user can choose to create one of the following automatic views:

- Plan drawing highlighting the impact of the elements situated above the slab:



- Plan drawing highlighting the impact of the elements situated below the slab:



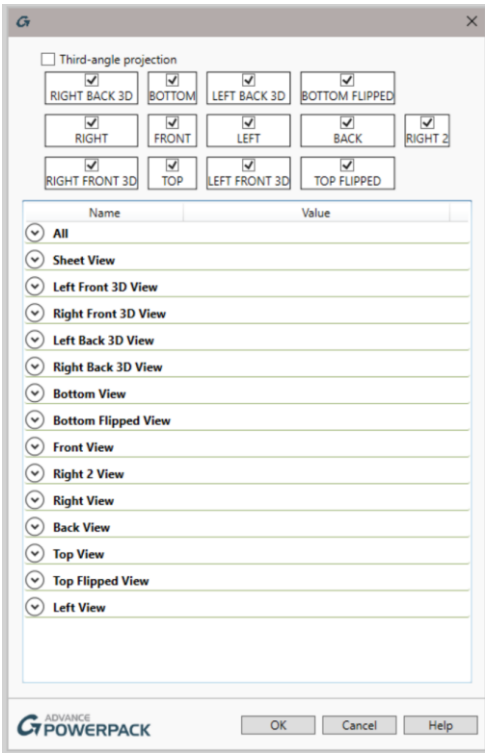
In addition, the tool can also work for Section & Elevation views.

One of the advantages of this functionality is that it offers the possibility to generate several views at a time. Running the command while a plan view is active will allow formwork drawings to be created either for the active view, or for a selection of multiple views:

12.2 View Sheet Generator

The **View Sheet Generator** command part of Graitec PowerPack for Revit helps you automatically create views for a selected assembly. The command allows the automatic generation of a set of detailed views for a selected assembly, views which are automatically arranged on a new sheet. Multiple selection is allowed and for each assembly a separate sheet is generated.

Click on the View Sheet Generator and select assemblies from the model. The dialog box opens after you have made your selection:



In this dialog the user can set which views should be created, what template to use, and the number of the template for each view, sheet, etc.

Under **All** the user will find the parameters for all views:

- **Template –** The template for views, is selected from the list of templates available on the project
- **View Port –** The template for the viewports, is selected from the list of templates available in the project
- **Crop Region Visible -** allows you to enable a crop boundary around the model. It can have a True or False value.
- **Detail View Scale –** Allows the user to enter a value for the view scale
- **Select Adjacent Elements -** allows you to select whether the views should include neighbouring elements or not. It can have a True or False value.
- **Adjacent Elements Distance -** if the previous option is set to True, you can then choose how much of the adjacent element will be displayed.
- **Create in Revit -** allows you to quickly select / deselect all the views to be generated. It can have a True or False value.
- **Reset -** is used to delete all additional views. It leaves only the default number of available views.

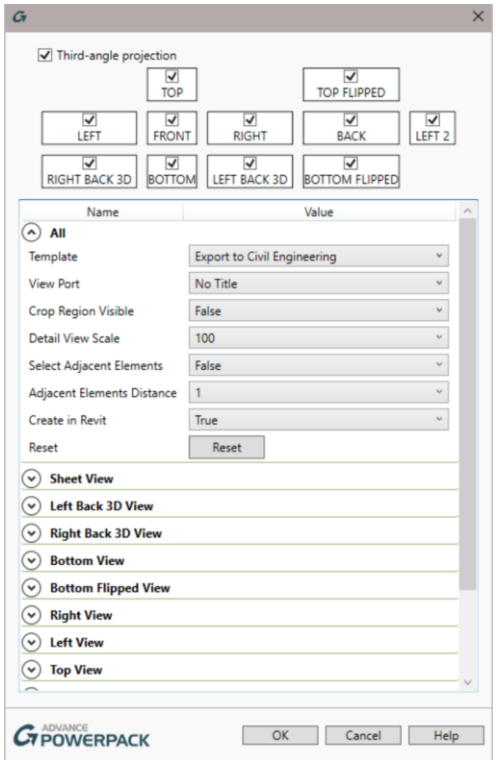
Sheet View contains the parameters for sheets

- **Template -** is the template for the title block. It is selected from the list of templates available in the project.
- **Sheet Name -** is the Sheet's name. You can use a variable with an assembly name (%Assembly Name%).

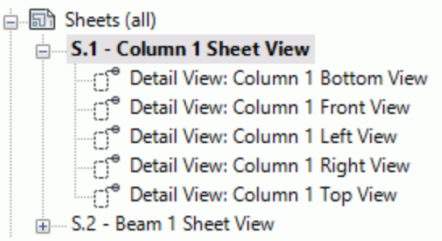
The remaining fields contain parameters for each individual view:

- **Create in Revit -** allows you to decide whether the current view is generated. It can have a True or False value.
- **Template -** is the template for the view. It is selected from the list of templates available in the project
- **View Name -** is the view's name. You can use a variable with an assembly name (%Assembly Name%).
- **View Port -** is the template for the viewport. It is selected from the list of templates available in the project.
- Offset - is the far clip offset value for the view.
- **Copy -** is used to add a copy of the selected view.

The user can also choose how to create the views, using the Third-angle projection or not:



After you finish configuring, click OK and a sheet with specific views will be generated. The result of the command is the list of Sheets with a set of Detail Views for each selected assembly. The details available on the sheet can be found in the Detail Views section, in the Project Browser.



12.3 Legends

The Legends command part of Graitec PowerPack for Revit automatically creates legends and updates them whenever it is necessary. The Legends command allows you to add a legend to the project browser containing all the relevant information of the family component. But some steps need to be taken in order to use the command.

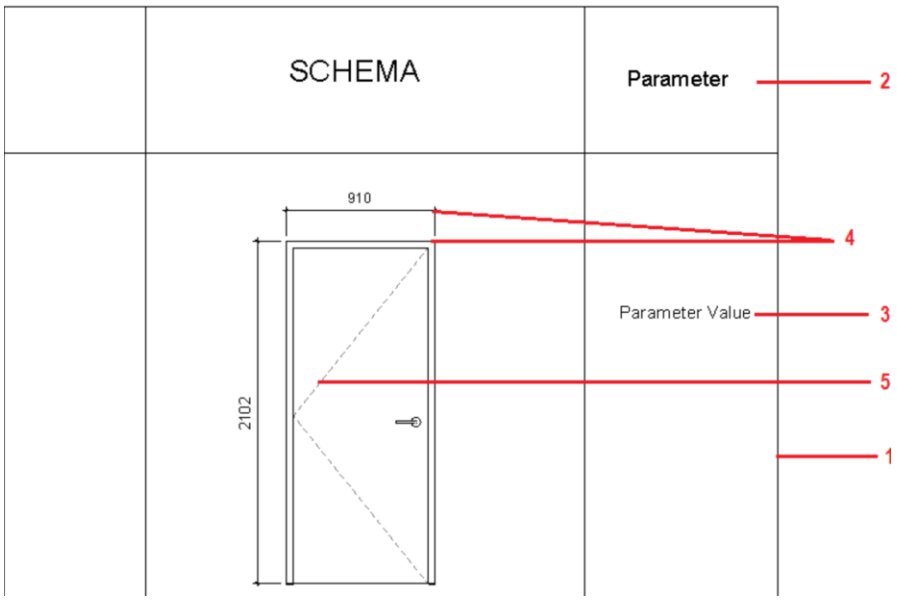
The first step that you need to take is to create a new legend view in the project. To add a family to the newly created view, from the project browser family list drag and drop a family for which you want to create a legend.

Around the family component, you will need to create your own table using detail lines, to represent the heading boxes of the parameters. Add text to the table to identify the parameter data.

You must then prepare the so-called graphical part of the legend. It is easier if you already have a template which can be duplicated using Duplicate view with details.

The elements composing a legend are:

- **The Frame –** in which the other elements are defined
- **Texts –** which can be converted in Parameter name
- **The Symbol Note –** general description.
- **Item Details –** Such as the frame dimension for windows and doors. This can be created with **Legend Dimension Frame.**
- The Graphical Description – of the object for which the legend is created.



The **Create / Modify Legend Unit** command is used for defining the set of elements that will be calculated in the legend unit. In the same time, it is used to determine the desired categories and parameters in the legend, in order to evaluate and create an array of these parameters.

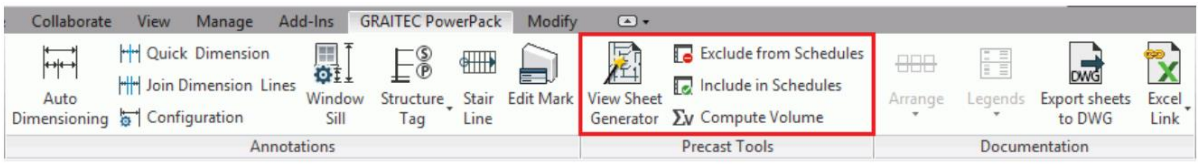
The **Modify Legend Unit Parameters** command allows you to add or remove parameters from the legend pattern.

The **Copy of Legend Unit** command allows you to make a copy of the legend unit, in order to make a change and use it for a new legend.

The **Create/Modify Legend** command allows you to create a legend

12.4 Precast Tools

The commands in the Precast Tools category help manage precast concrete elements – assemblies



The tools include the following:

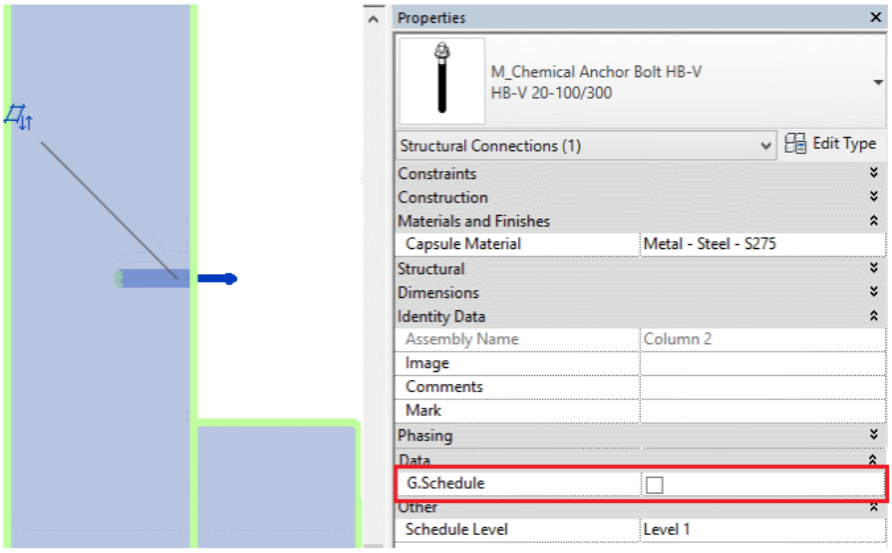
- Exclude from Schedules
- Include in Schedules
- Compute Volume

12.4.1 Exclude from Schedules and Include in Schedules

The **Exclude from Schedules** command is used to set as disable the parameter for filtering assembly components in schedules, while **the Include in Schedules** command is used to set as enable the parameter for filtering assembly components in schedules.

To run the Exclude or Include command, you have to select the assembly. The assembly should have one main element (structural column or structural framing beam) and structural connection components.

The first use of the Exclude from Schedules/Include in Schedules command adds a parameter (G. Schedule) to all additional (structural connection) components. The G. Schedule parameter is available in the Data section of the Properties window for the selected components (structural connection), in the assembly edit mode.



The next use of the **Exclude from Schedules** command changes the G. Schedule parameter to False.

The next use of the **Include in Schedules** command changes the G. Schedule parameter to True.

This parameter allows you to filter structural connection components in the schedules of the assembly.

12.4.2 Compute Volume

The Compute Volume command calculates the volume of an assembly with or without subcomponents.

To run this command, you have to select the assembly. The assembly should have one main element (structural column or beam) and additional General Model components.

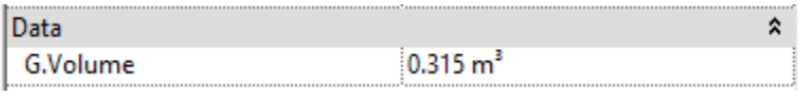
The command allows you to decide if some components should be included in the total volume of assembly.

The first use of the Compute Volume command adds a parameter (G. Compute Volume) to all additional (Generic Model) components and adds the G. Volume parameter to the main element.

The G. Compute Volume parameter contains a check box and can be set to True / False (the parameter is set to True as default). For each component, you can set this parameter independently.

The G. Compute Volume parameter is available in the Data section of the Properties window for the selected components, in the assembly edit mode.

The value of the G. Volume parameter represents the total volume of the assembly's components, including the volume of the main element and the volumes of all the components when the G. Compute Volume parameter is set to True.

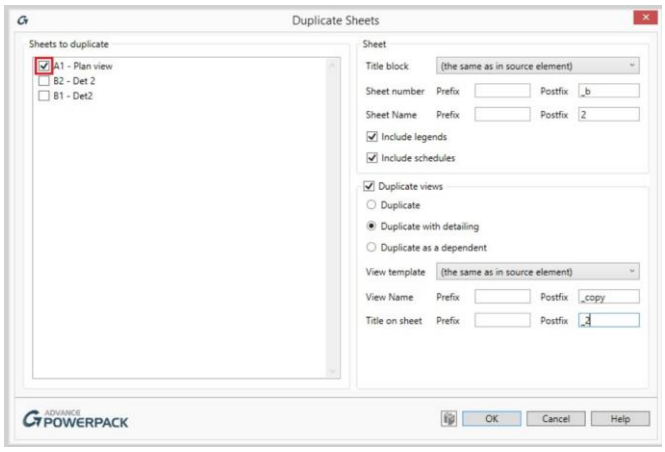


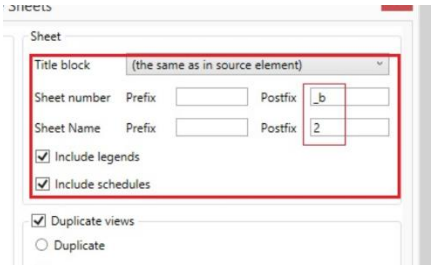
The next use of the G. Volume parameter refreshes the total volume of the assemblies (Volume parameter value).

12.5 Duplicate Sheets

The Duplicate Sheets command part of Graitec PowerPack for Revit allows you to quickly duplicate sheets.

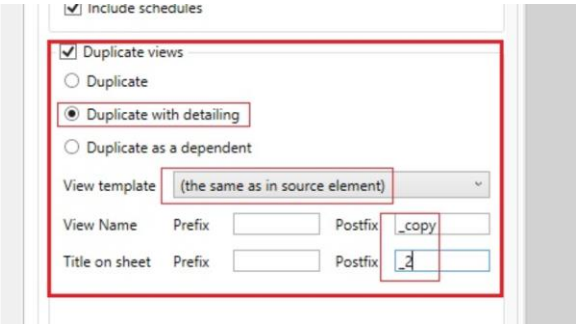
Firstly, select the sheets you want to duplicate. A drop-down menu appears and allows you to select the Title Block option (it can be set to none / the same as in source element or you can select any title block that was previously loaded in the Project).





- Add prefixes and postfixes to customize Sheet number and Sheet Name.
- Check the boxes if you want to Include legends and schedules of the sheet to duplicate.

Afterward, you can choose if you also want to duplicate the views in the sheet.



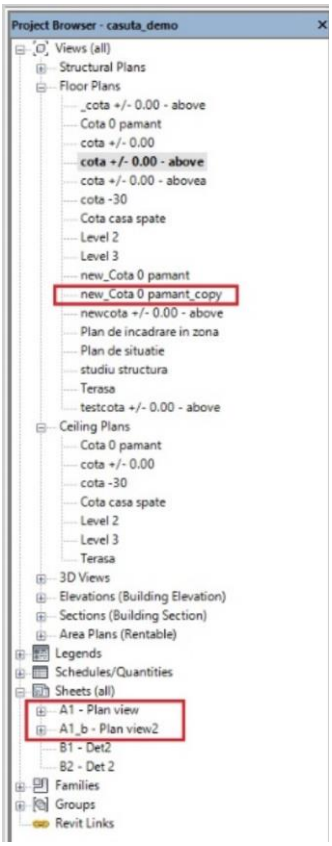
The **Duplicate** option creates a **duplicate** view of the model elements within the view.

The **Duplicate with detailing** option creates a **duplicate** view including the detail and annotations elements. They are independent from elements of the parent view.

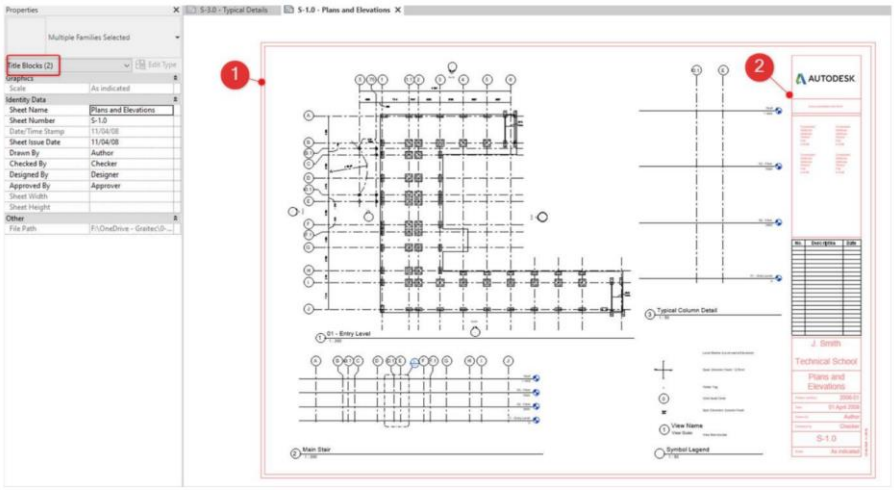
The **Duplicate as dependent** option creates a dependent view that behaves as the parent view. Any changes made to either the parent or the dependent view, will be applied to both views.

Select the **View template** option for the selected views from the related drop-down menu and add prefixes and postfixes to customize the **View Name** and the **Title on Sheet**.

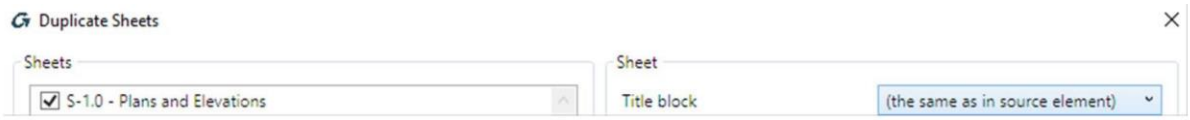
Revit will **duplicate** the selected **sheet** with the modified **Sheet Number** and **Sheet Name**, will create the duplicated view/s, and will update the title displayed on **sheet**



The Duplicate Sheets command can duplicate sheets comprised of several title blocks such as this example:



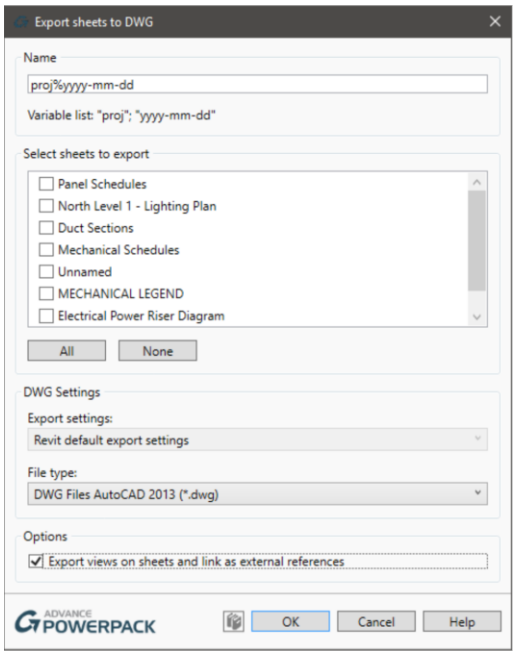
When choosing the option “the same as in source element”, all tittle blocks included in the sheet will be duplicated as well.



12.6 Export Sheets to DWG

The Export sheets to DWG command part of Graitec PowerPack for Revit helps you export Revit Sheets to DWG.

When the command is used for the first time, a dialog will pop up, where several configuration settings can be done



Name - Configure the name of the DWG file. The variables project name (proj) and system data (yyy-mm-dd) can be used.

Selected Sheets to Export – Select the sheets you want to export

Export Settings - DWG Export settings can be defined in Revit using the Revit/Export/Options/Export Setups DWG/DXF option.

File Type - Helps you choose the type of the new DWG file: AutoCAD 2010/2007/2004/2000.

Export views on sheets and link as external references - Choose if you want any DWG links in the project to be exported to a single file, rather than to several files that reference each other.

12.7 Arrange Views

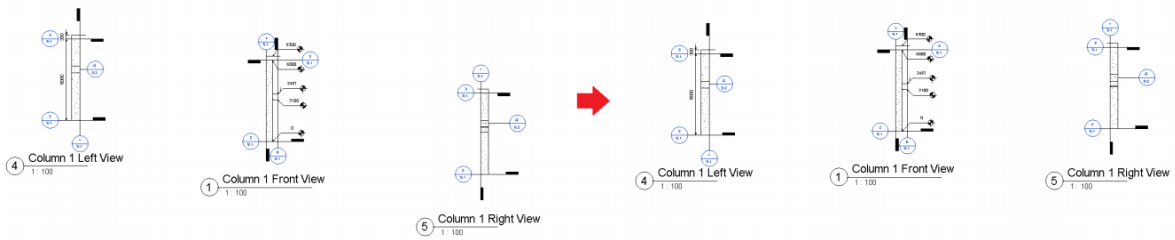
The Arrange command helps you align horizontally, vertically or by a line on a sheet all the selected viewports.

To run Arrange commands the user needs to activate the sheet view. Arrange can be used on any viewports on the sheet. It contains the following commands:

- Align Vertically by Left Edge
- Align Vertically by Right Edge
- Align Vertically by Central Line
- Align horizontally by Top Edge
- Align horizontally by Bottom Edge
- Align horizontally by Central Line
- Arrange along the Line
- Auto Arrange

Necessary steps for using the Align Vertically/Align Horizontally commands:

Select the viewports to be aligned, then select the viewport to which you want to align:



Necessary steps for using the Arrange along the Line command:

Draw the Detail line on the sheet and run the Arrange along the Line command. Select the viewports to be aligned, then select the Detail line to which you want to align: