Option System Guide

VERTEX
SYSTEMS

Vertex BD Option System Guide

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Conventions

This guide uses the following conventions:

Example	Description
/shared/projects	Folder
user/SETUP	File in the directory structure of Vertex application
`set.gridsnap.on`	Keyword in the system settings
Reference Drawing or Model	Name of a function
File > Save	Name of a function in a drop-down menu
F6, Ctrl+O	Keyboard command

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1 Introduction

The Option System add-on feature of Vertex BD software allows the design of buildings with optional structures and optional materials in one integrated building model and database. It manages architectural, construction, and material information. It also produces the construction documentation required for construction and manufacturing of optionalized buildings.

Once the base model and the options have been designed and defined, the graphical representation of the different design alternatives can be created. The options selected will be automatically incorporated into the floor plans, elevations, 3D models, framing plans, panel drawings and other required documentation. Material lists are automatically updated reflecting the correct material quantities and costs for the specific selected option combination.

About This Manual

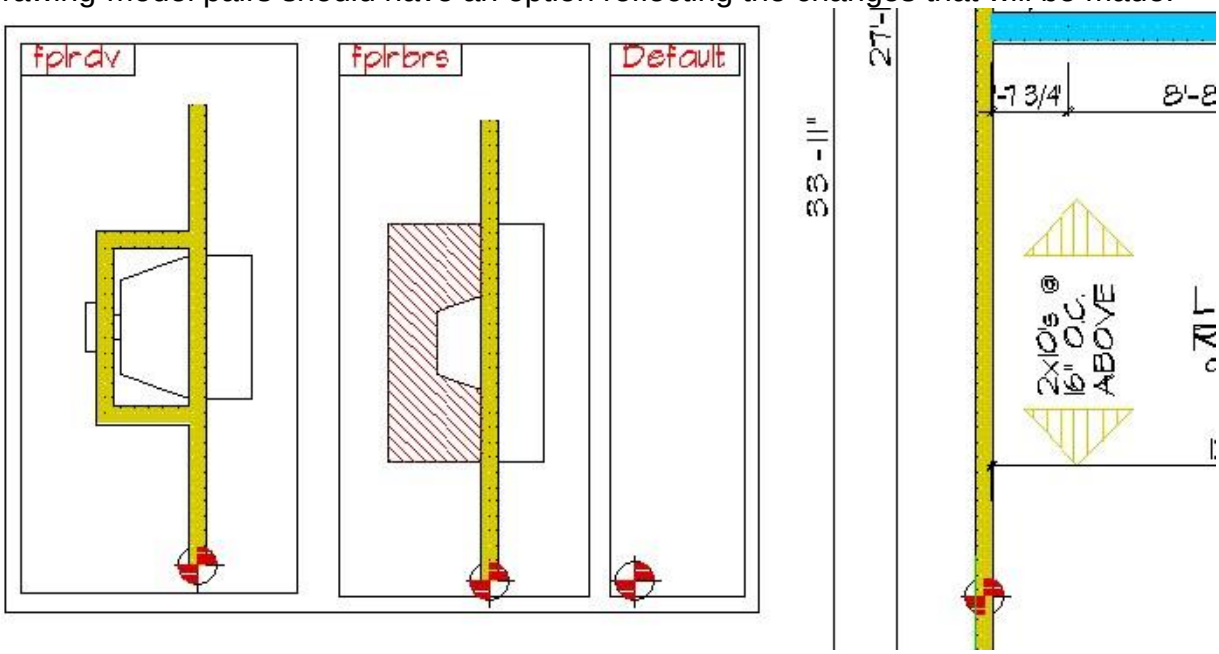
This user manual will guide you through the basic steps for defining, adding and solving options of a building. The user manual presumes that you have the basic knowledge of using Vertex BD software. The key features of Option System are briefly described, followed by an example of how the functions are applied to a project design. You can find instructions of all the features of the Option System in Vertex BD Help. Open the help file in either of the following ways:

- Select  **Help** from the menu bar.
- You can open the help for an individual function from the button menus. Move the cursor over the button, and hold shift while clicking the left mouse button to open the help.

Understanding and Using Options

The options method enables you to create variations within a project. This means that you can easily create additional unique models from a single project. An option may be as simple as substituting a dishwasher for a cabinet, adding a decorative trim package, or adding a fireplace. An option may also be as complex as adding a three-car garage, changing the exterior material on the front elevation and changing windows, or adding a wet bar sink and changing a bedroom into a library or study.

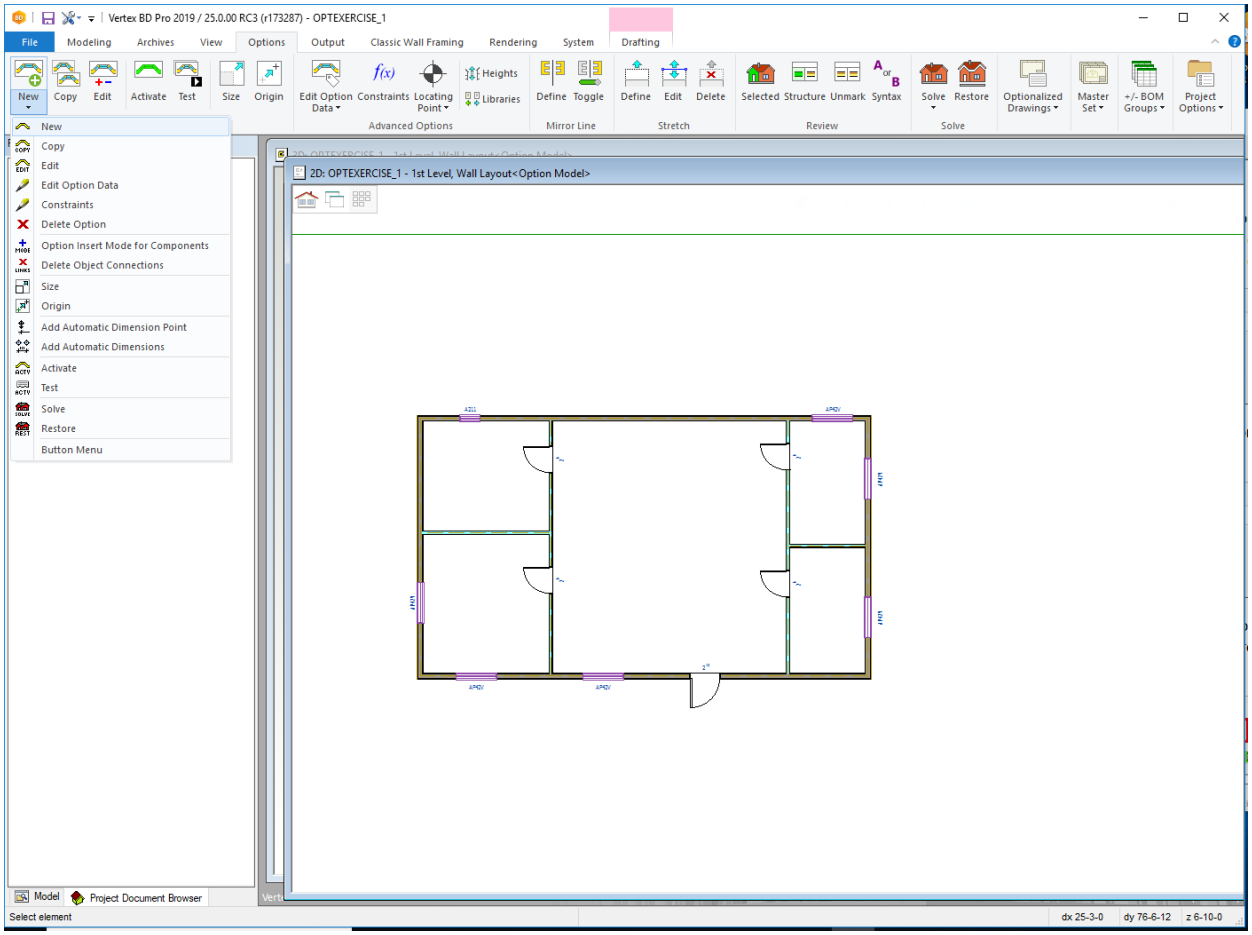
The possible options for a project are defined in the Options database. The database contains information about the options, like option id, name and description. After this, the option is designed in the floor plan drawing or in the model by modifying the building components. To solve an option correctly, all drawing-model pairs that are affected by the option must be modified. In other words, if a fireplace is added as an option, the foundation, first floor plan, first floor deck, second floor plan, second floor deck, and roof drawing-model pairs should have an option reflecting the changes that will be made.



To create a variation of the building, the desired options are selected and the options are solved. When the options are solved for the full project, a new set of job-specific drawings are created. The base drawings, and any secondary option drawings, are left intact so additional options can be created.

Overview of the User Interface

When the Option System add-on feature is included in your software, you can open the Option System function menu by clicking the **Options** tab on the ribbon bar.



Note: You can check the available software add-on features by selecting **File > This Software Version** from the ribbon bar. The add-on features included in the software will be displayed in a message box.

Design Process

When you design options, follow these main steps:

1. Define the options in the options database.
2. Cut the links between objects, for example cut walls.
3. Define the options on the drawing by selecting building components.
4. Design the new option by changing the configuration of the building components.
5. Select the building components to be added to the option or to be removed from the option.
6. Verify the defined option by activating it in the active drawing-model pair, or in all drawing-model pairs at once.

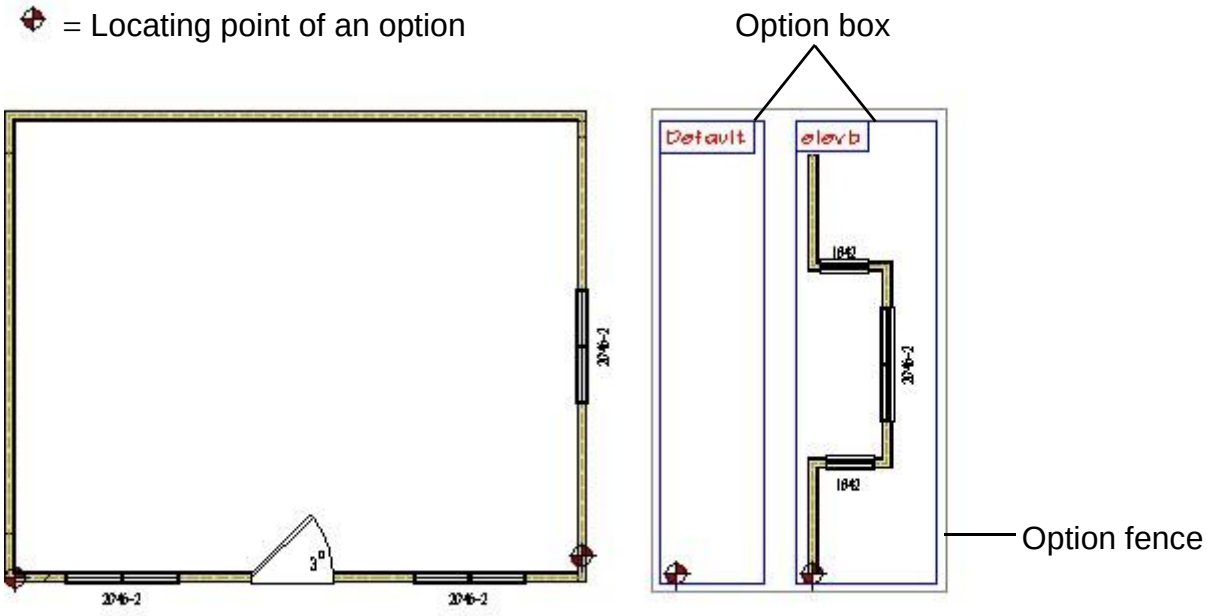
7 Solve the entire model with the desired options.

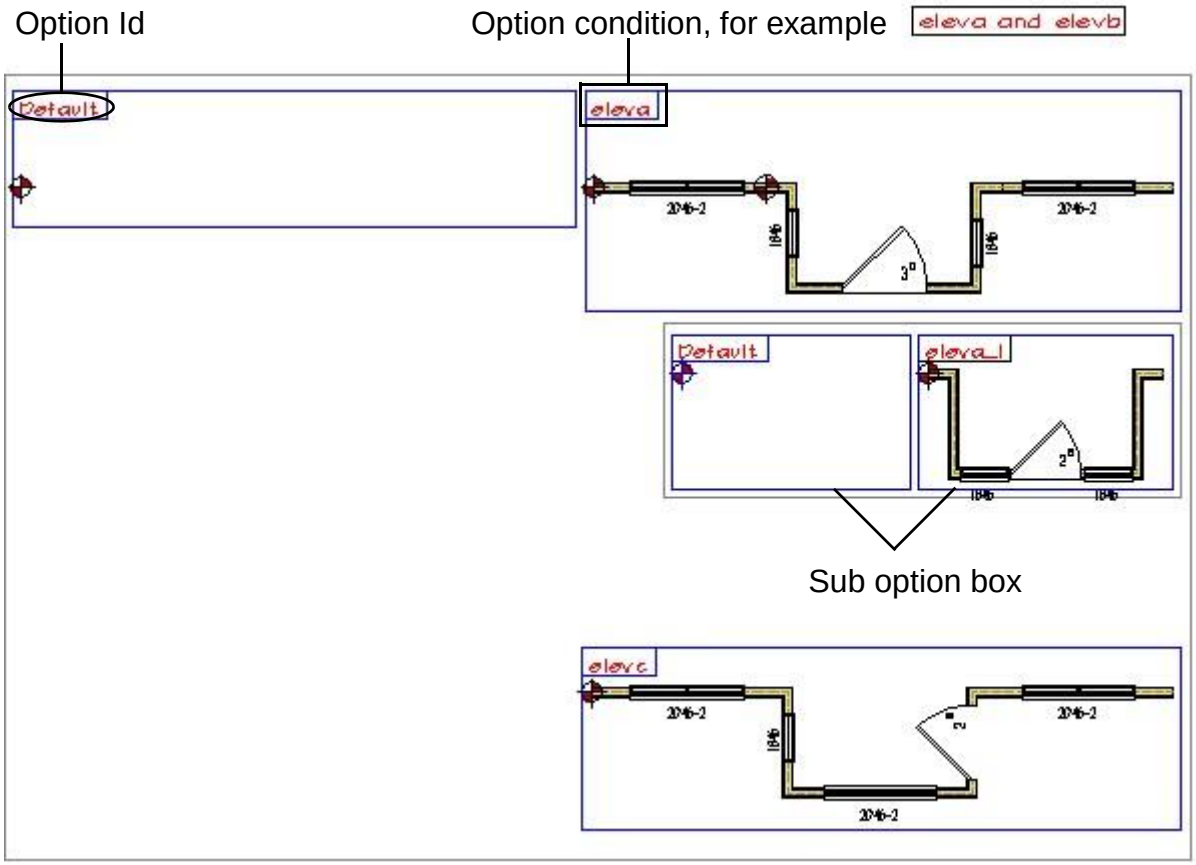
8 Restore the original model.

Details of these steps are described in the following chapters. In each chapter the functions are are applied to an example project design.

Basic Concepts of Options

The figure below explains some basic option system concepts used in this user manual.





2 Options Database

The Options database describes all of the options that are a part of the project. Each option that is to be solved must be listed in the database. You may have more options in the Options database than are used in the project; however, this may confuse other users who may try to solve for a specific option that is not defined on the plan. Only options that are defined on the plan will be solved.

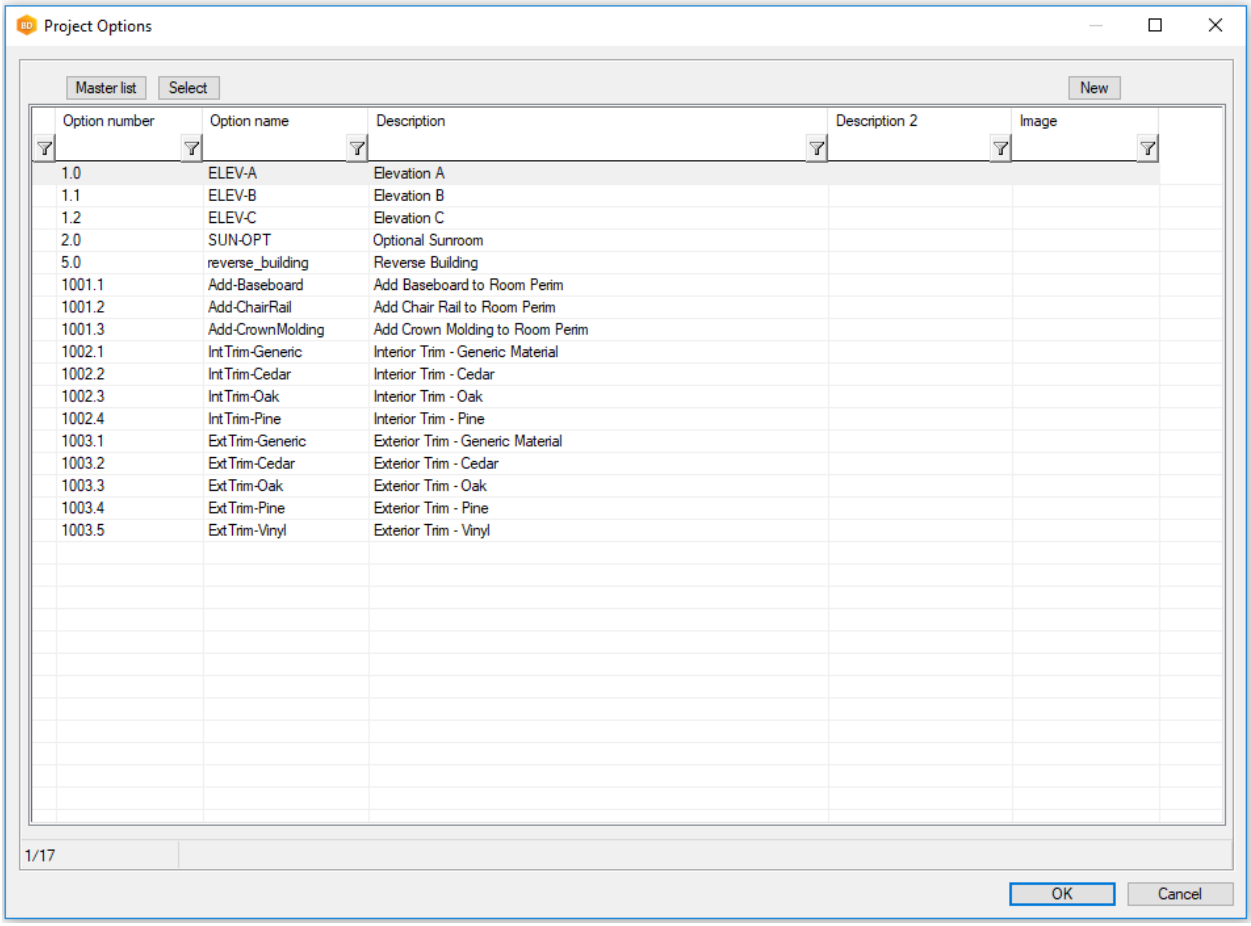
You can use the template projects to set up the option information. Define an option database for each template project you use for creating new projects. After you have created a new project, you can modify the option database of the project by adding or deleting items. The Options database is stored with the project so the same option names can be used in multiple projects.

Opening the Options database

Open the Options database in the following way:

1 In the Options tab, select **Project Options > Project Options**.

The Project Options database view opens. There may be options already available for a new project if the option information has been set up in the template project that has been used to create the project. Below is an example of a template Options database.



The parameters on the database view are:

- **Option Number** - Used to sort and organize the option list, its number must be unique.
- **Option Name** - This is the key field. It is the name of the Option and will be displayed on the drawing (16-character limit). It is also what is used to identify the option when the option is added, edited, or solved.
- **Description** – Option description.

Adding Items into the Options Database

Before adding an option to the floor plan of the project, the option must be defined in the Options database. You may add options to the database at any time, even when you are adding options to the floor plan. Add an option to the Options database as follows:

1 In the Project Options database view, move to the location where you want to add the item and do one of the following:

- **Right Click > Copy Row** or press Ctrl+Shift+Insert. This will copy the line where the cursor was located.
- **Right Click > Add Row Before** or press Shift+Insert. This will add a new line above the line where the cursor was located.
- **Right Click > Add Row After** or press Alt+Shift+Insert. This will add a new line below the line where the cursor was located.

2 Fill in the fields **Option Name** and **Description** in one of the following ways:

- Select one of the following from the **ID** list:

Option Name	Explanation
header	A header does not define a true option. You can use the header alternative to define a group of options. Define the header as the main level of options and then define sub options under the header.
default	The default option for the structure or the components.
reverse_building	An option which mirrors the building or a drawing in relation to a user defined axis.

  Type a description in the **Description** field.

- Type a desired label in the **Option Name** field. Allowed characters in the **Option Name** are the letters a-z and A-Z, numbers 0-9 and the special character underscore (_). Do not use the following character strings within the body of the **Option Name**: or, and, not. For example "motorrm". Type a description in the **Description** field.

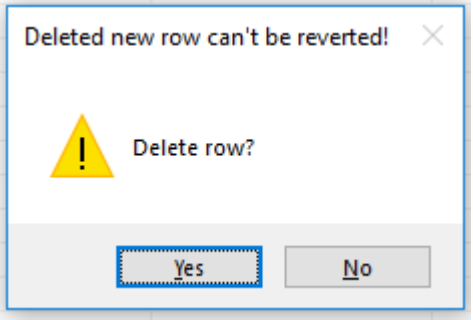
3 Type the number of the option in the **Option Number** field.

Removing Items from the Options Database

To delete an option from the Options database, do the following:

1 In the Project Options database view, move the cursor to the row that you want to delete.

2 **Right Click > Delete Row** or press Shift+Delete. You will receive the prompt: Delete row?



3 Select **Yes** and the row will be deleted.

While you are active in the current database, any additional deletions will be immediate; you will not be prompted each time.

Saving or Quitting the Database

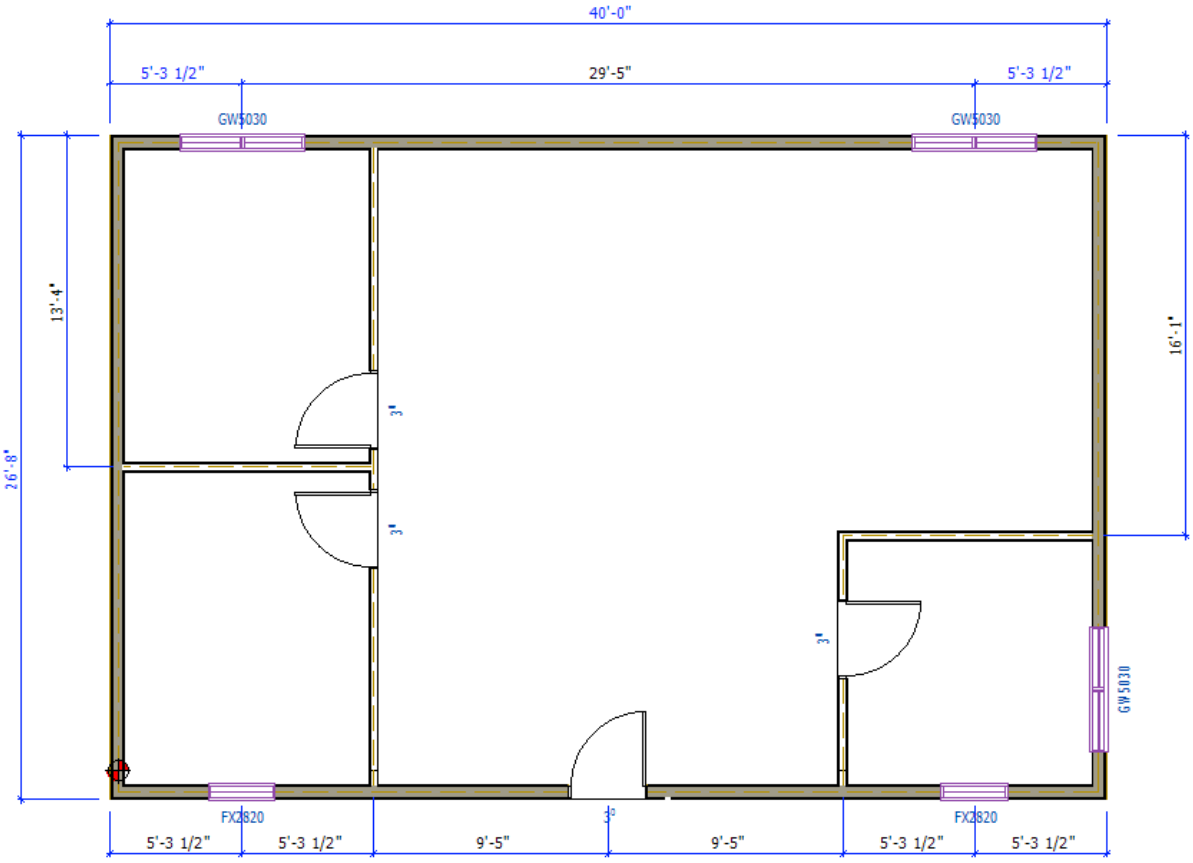
To save the database, click the **OK** button in the database view. All the changes you made will be saved and you will exit the database. To quit without saving the changes, press the Esc key or click **Cancel**. You will then be prompted to save the changes. Select **No** and you will exit the database and the changes will not be saved.

Example Project

In the following chapters of this guide, you will learn how to use the options functions by examples. The example project used in this guide is a simple one-storey building. The floor plan of the example building is shown in the figure below. Create a new project based on a regular template project and add the building components to the following drawing-model pairs:

- Add the walls and dimensions to the 1st Level, Wall Layout drawing-model pair.
- Add the foundation walls to the Foundation or Basement drawing-model pair.
- Add the floor to the 1st Level, Deck Layout drawing-model pair.
- Add the gable roof to the Roof drawing-model pair. Stretch the wall sidings to the roof.

Select the wall, window and doors types as you prefer.



Creating the Options Database of Example Project

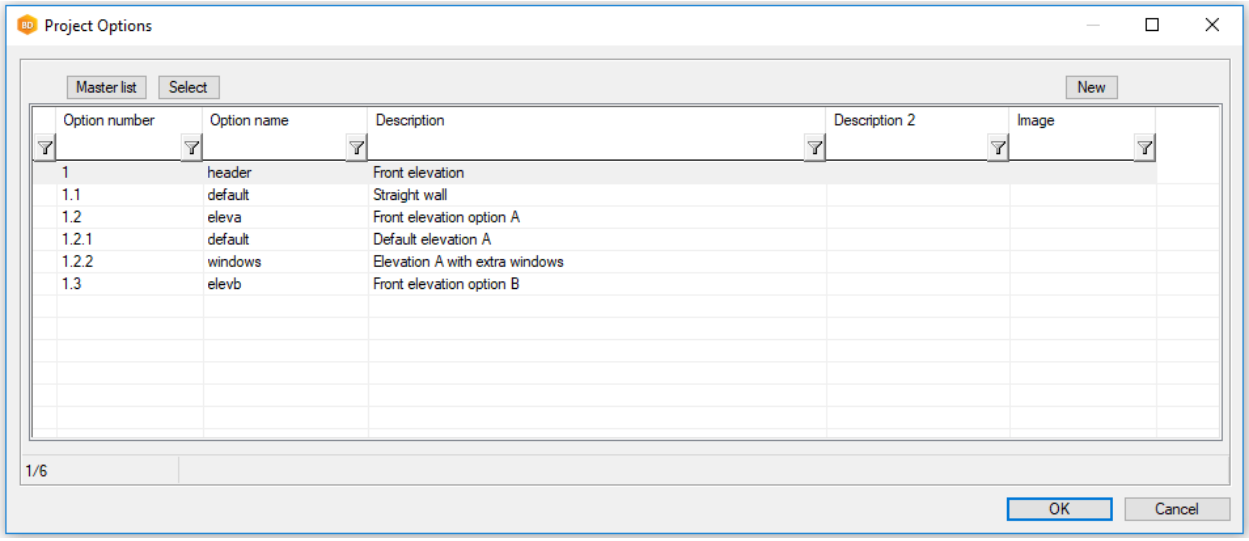
In the example project, you will create an Options database of your own. If the project template you used includes an Options database template, you can delete all the items

in the database and define new ones. Use the procedures described earlier to open the database, delete lines and add new lines.

1 Open the Options database.

2 Delete all the lines in the database, if there are any.

3 Add new lines to the database and fill in the data as shown in the database view below.



The line **1 header** does not define an option but it is a header line which defines the front elevation as the component for which options are created.

The option **1.1 default** defines the default shape of the front elevation which in this example is a straight wall.

The options **1.2 eleva** and **1.3 elevb** are the options for the front elevation.

The option **1.2 eleva** has two sub options, the **1.2.1 default** and **1.2.2 windows** (elevation with extra windows).

You will learn more about these options and create new ones in the following chapters.

4 Click **OK** to save the database and to close the database view.

3 Adding Options to the Floor Plan

You may add as many options to a floor plan as needed. You may have more options in the options database than are used in the project, but only options that are defined on the plan will be solved.

One of the major features of options is to create optional elevation conditions that you can use to create a number of different styles. For the project example, you will create an elevation with various modifications.

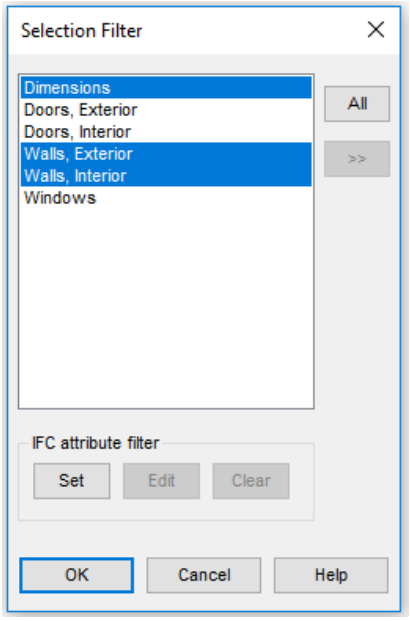
Adding an Option to the Plan

1 Load in the appropriate drawing-model pair for the option addition. For this example, open the **1st Level, Wall Layout** drawing-model pair.

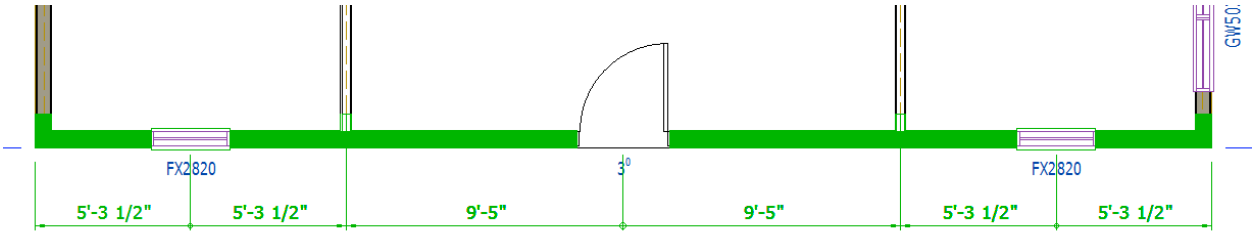
2 In the Options tab, select **New**.

3 You can control which objects will be selected with a filter tool. Click the **Selection Filter** button on the toolbar.

By default, all element types are selected in the Selection Filter dialog box. For this example, select the element types **Dimensions, Walls, Exterior** and **Walls, Interior** and clear other selections.



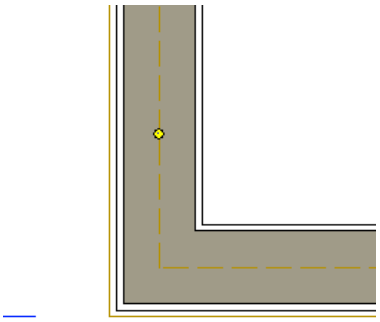
4 Select all objects that you wish to add to the option. Hold down the Ctrl key while clicking the objects. In the example project, select the following walls and the dimensions.



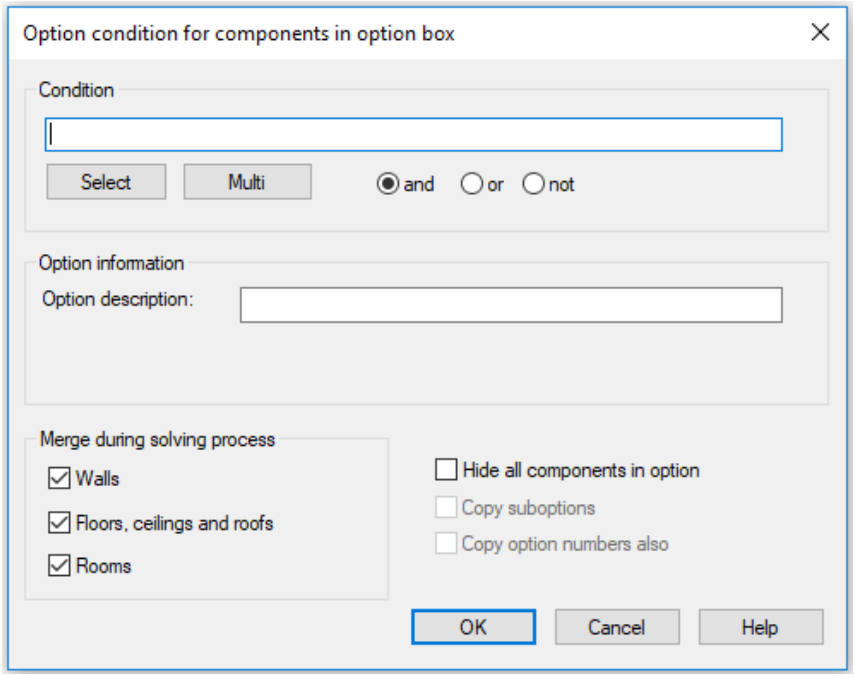
To avoid selecting the entire length of the vertical walls, you can use the Cut Wall function before creating the option. Click on the wall you want to cut, select **Cut Wall**, and then select where you want the cut to be made.

5 Select the **Confirm** function.

6 Select the origin point, or the point that you will use as a locating point for the option. Select a point that will not interfere with any other option location. In the example project, click the point shown in the figure below.



The system will add an origin point symbol to the selected location. The Option Condition for Components in Option Box dialog box opens.



In the dialog box, you can use three operators to define conditions for options:

- **And** - The option on the floor plan will only apply if options A and B are both selected to be solved.
- **Or** - The option on the floor plan will only apply if option A or option B is selected to be solved.
- **Not** - The option on the floor plan will only apply if option A is selected and option B is not selected to be solved.

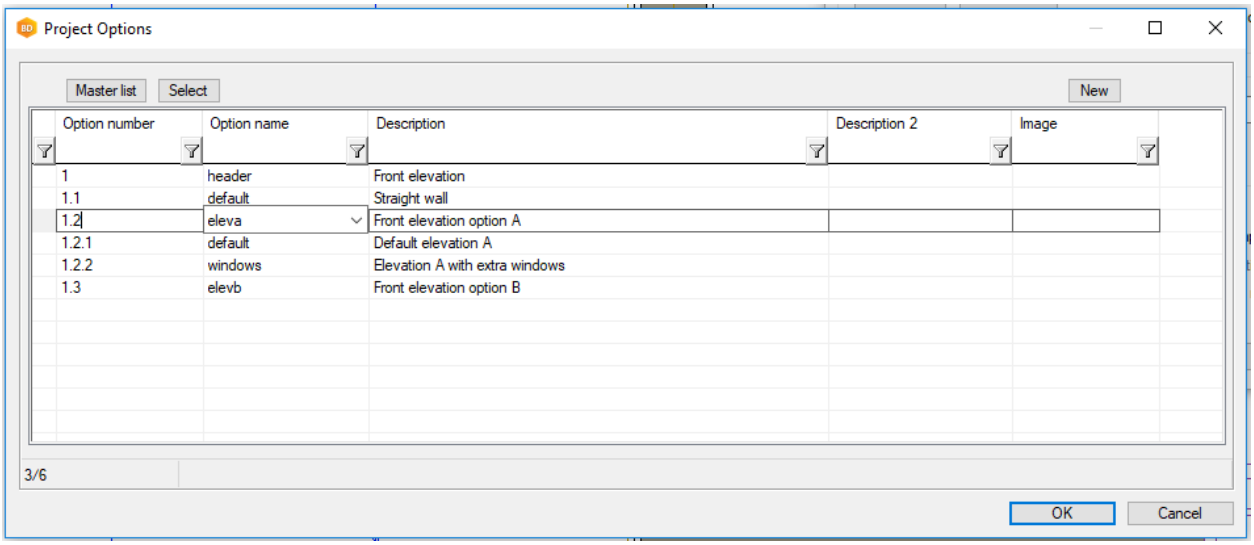
At this point, you don't have to use any of these operators. You will use the **Or** operator later in the example project when defining a sub option.

The objects you have cut before defining the options will be merged during the option solving process when you select the appropriate check boxes. By default, all check boxes (**Walls**, **Floors, ceilings and roofs** and **Rooms**) are selected.

By selecting the **Hide all components in option** check box the system will hide the 2D/3D geometry of the options and improve the speed of the system. In this example, leave the check box blank.

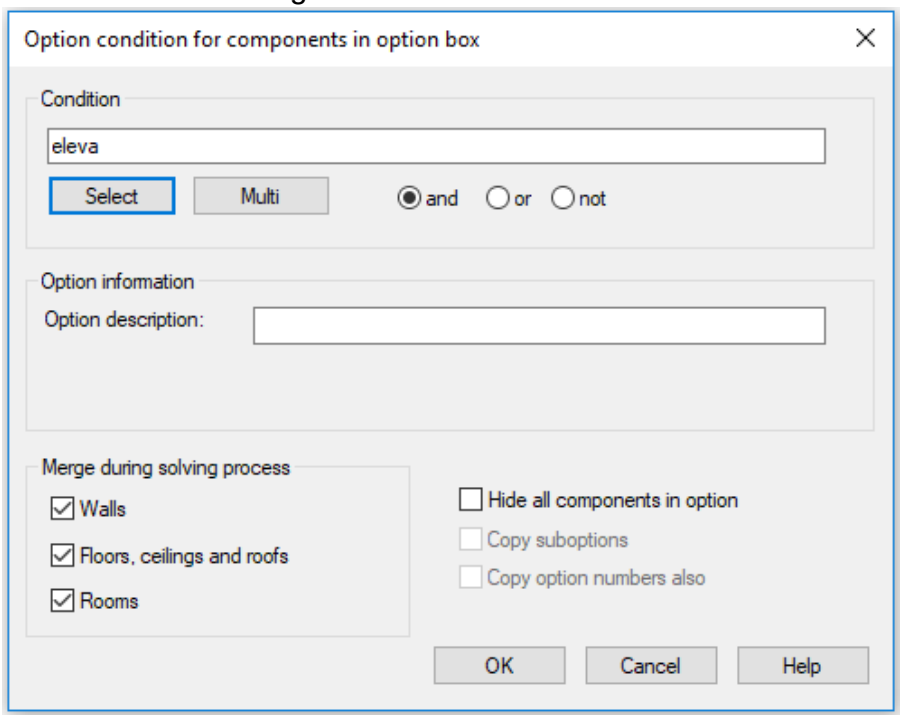
7 To select the options from the Options database, click the **Select** button in the dialog box. The Project Options database view opens.

8 Move the cursor on the line **1.2 eleva** and click **OK**.

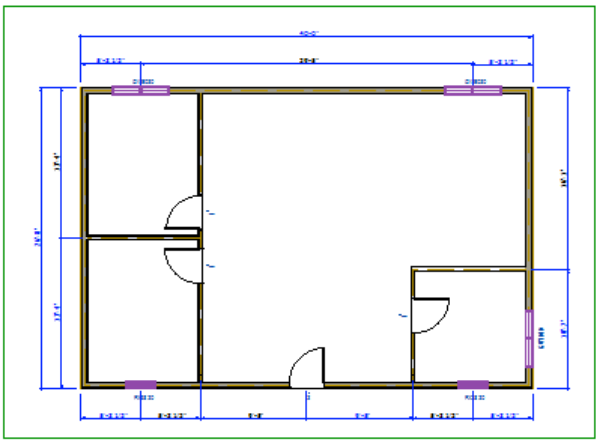


The Option Condition for Components in Option Box dialog box opens again.

9 Click **OK** in the dialog box.



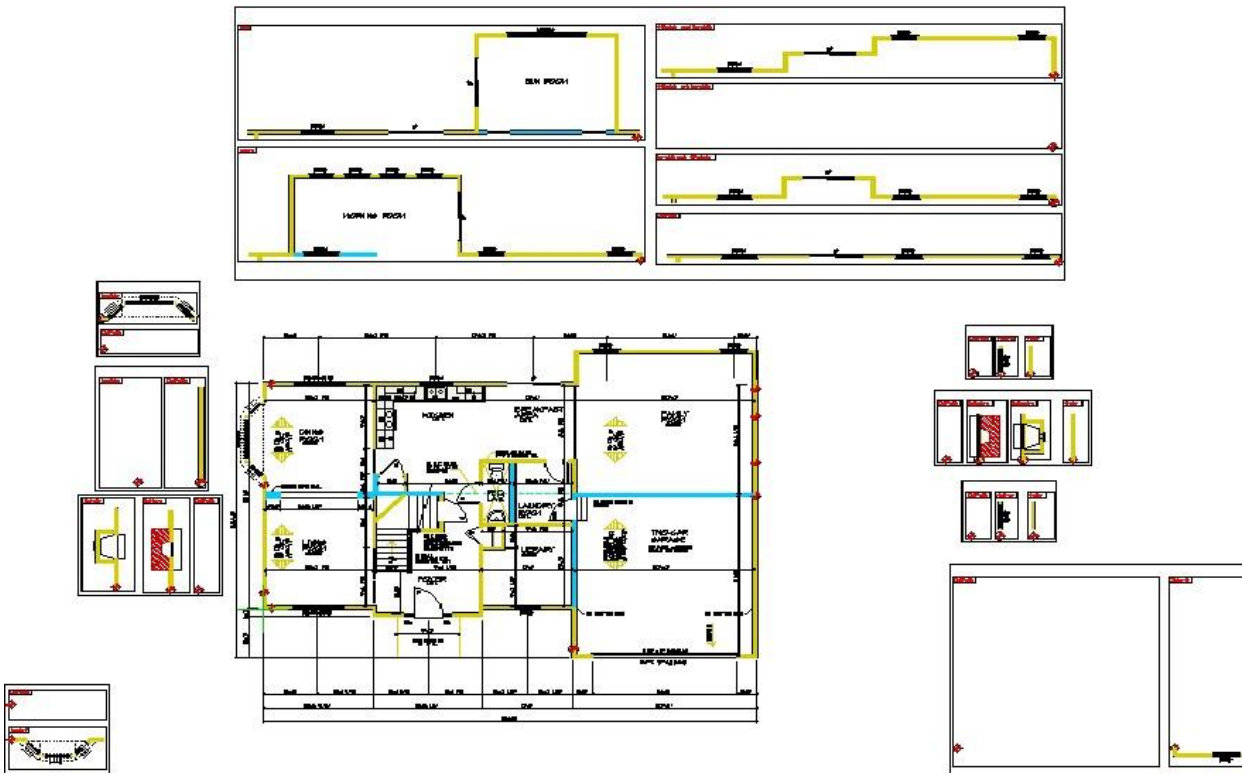
10 Select the location for the option box. Zoom out the drawing by pressing the F7 key, for example. You can lock the cursor in the x or y axis direction, in which case the cursor is locked to move through the selected locating point. Place the option box far enough away from the floor plan drawing that it will not interfere with the current plan's notes and dimensions.



The program copies the walls and dimensions you selected to the **Default** option box. You can now edit the walls and dimensions on the floor plan drawing to create the elevation option.

11 Select **Zoom Extents** from the toolbar or press Shift+A.

The options can be anywhere in the drawing area. The next figure shows another example of a floor plan drawing where there are 15 options defined in one drawing. Each option has a fence around it and is far enough away from the original base plan that notes and dimensions can be added.



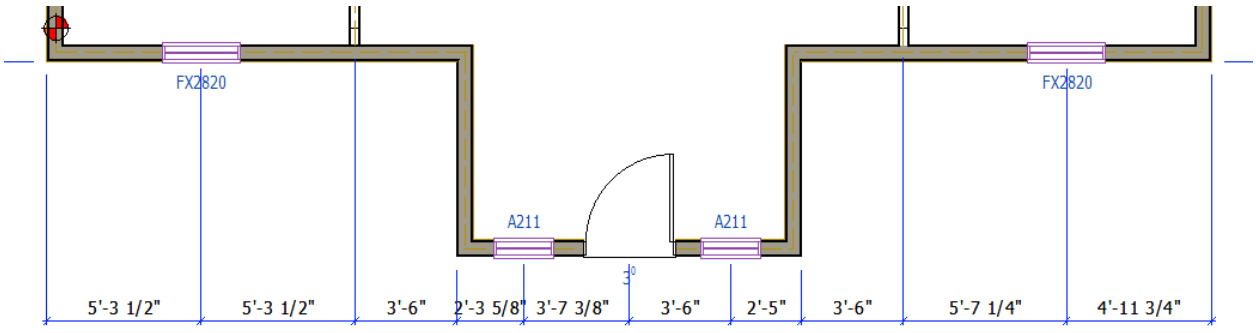
Note: You may have hidden the layer to which the option box geometry is added if you have activated a layer group while creating the floor plan. If the option boxes are not visible in the floor plan drawing, select all layers as visible by going to the View tab and selecting **Layers > All Layers**, for example.

Editing the Option

After you have added the option definition to the floor plan, you can modify the walls and other components to design the optional elevation.

Editing the Configuration of the Components

In the example project, change the wall layout by adding, deleting and trimming walls. The result is shown below.



To create the example elevation, follow these steps:

1 Add the new walls with the **Wall** function.

2 Cut the original front wall with the **Cut Wall** function. Cut the wall at two points.

3 Delete the extra part of the front wall.

4 Form corner joints with the **Joint** > **Corner Connection** function.

5 Add a door and two windows of your choice.

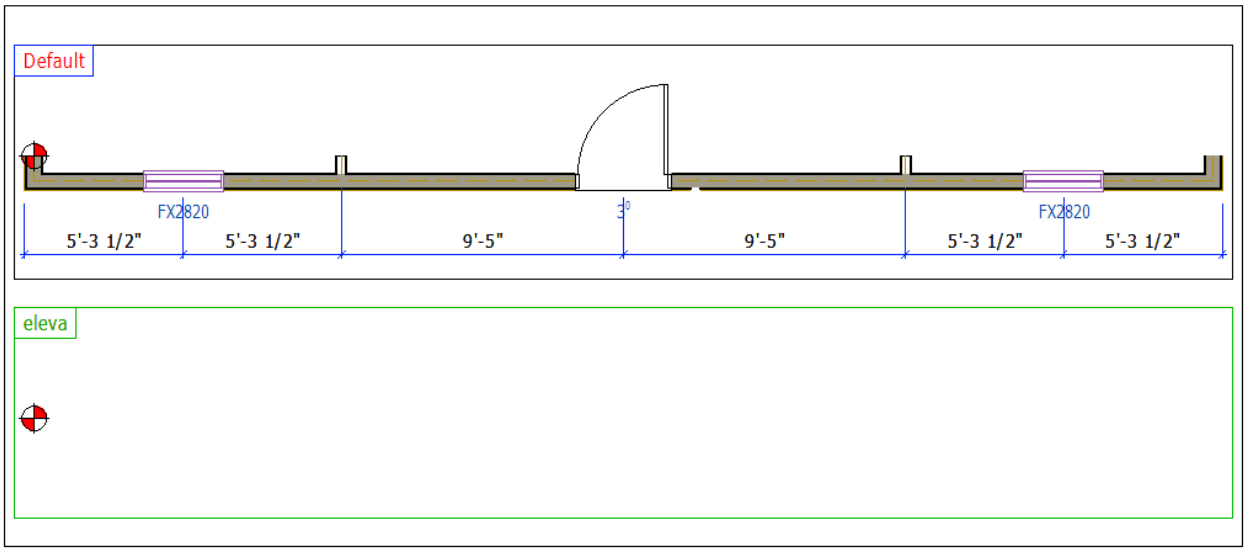
6 Add new dimensions.

Adding Components to the Option

After designing the elevation, add the components you have inserted to the defined option condition. In the example project, add the extra walls to the **eleva** option condition.

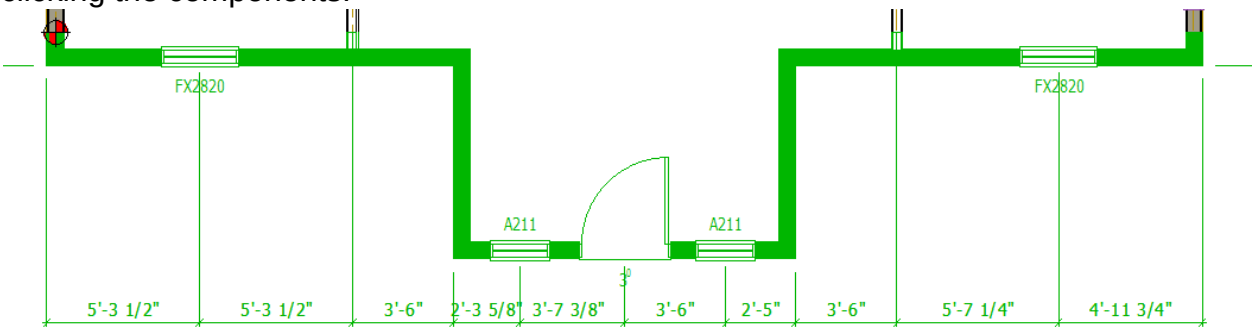
1 In the Options tab, select **Edit**.

2 Select the **eleva** option box.



The option box and all objects associated to the option become highlighted in green.

3 Select the walls and the dimensions you have added. Hold down the Ctrl key while clicking the components.



4 Select the **Confirm** function.

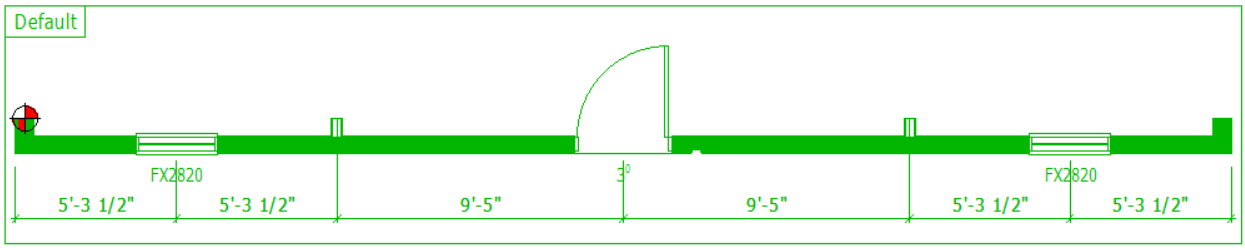
5 Press Esc to quit the function.

Activating an Option

Now you have two options for the front elevation: the **default** option and the **eleva** option. Switch the **default** option active in the following way:

1 In the Options tab, select **Activate**.

2 Select the option you want to activate.



3 Select the **Confirm** function.

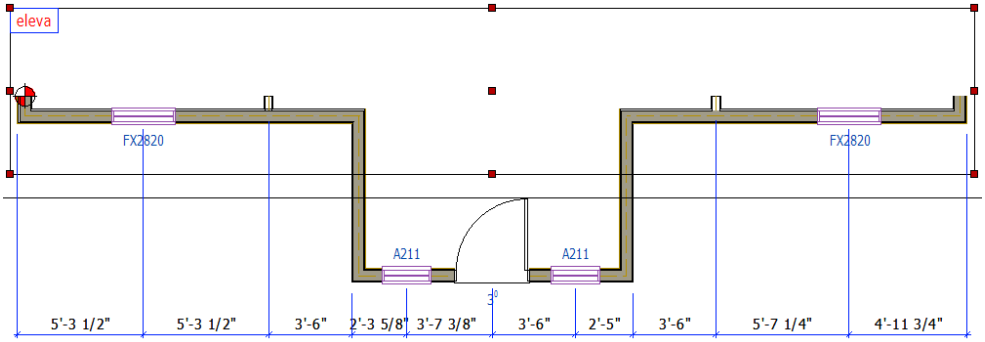
The **default** option is activated. The components of the **eleva** option are moved to the **eleva** option box.

Editing the Option Box Size

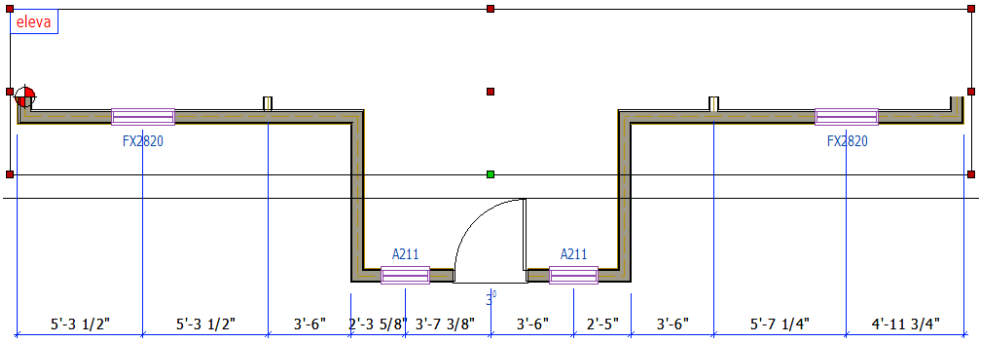
Edit the **eleva** option box size to fit in all the components of the option.

1 In the Options tab, select **Size**.

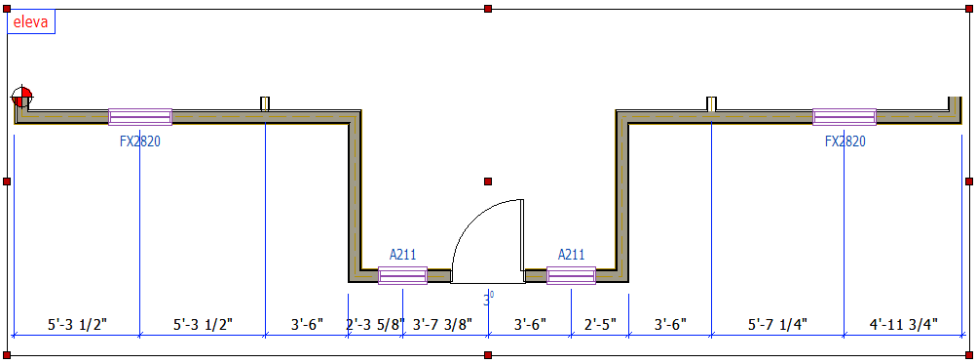
2 Select the option box.



3 Select the edge to be moved.



4 Select the new location.



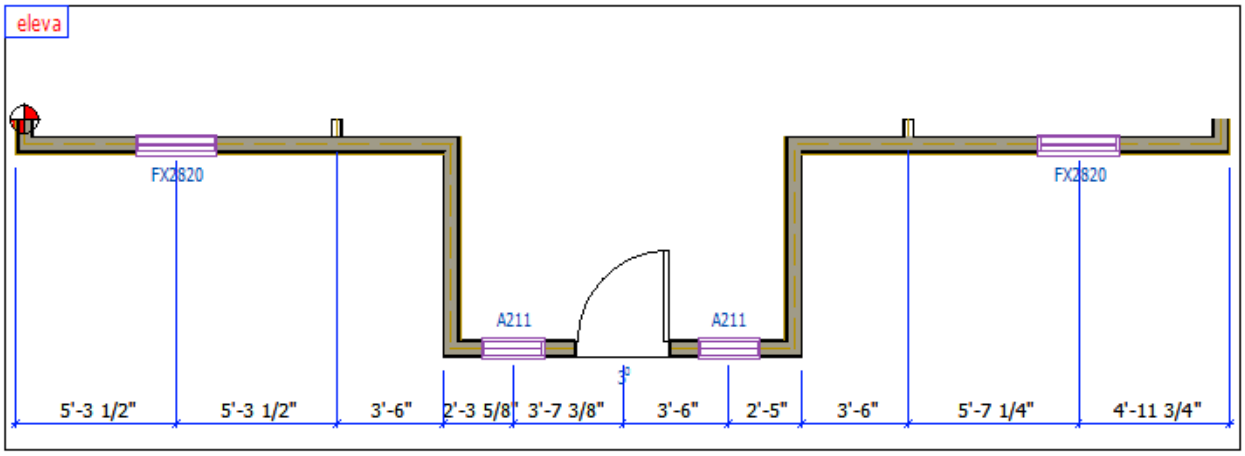
5 Quit by pressing the Esc key.

Copying an Option

In the example project, create another elevation option by copying the **eleva** option.

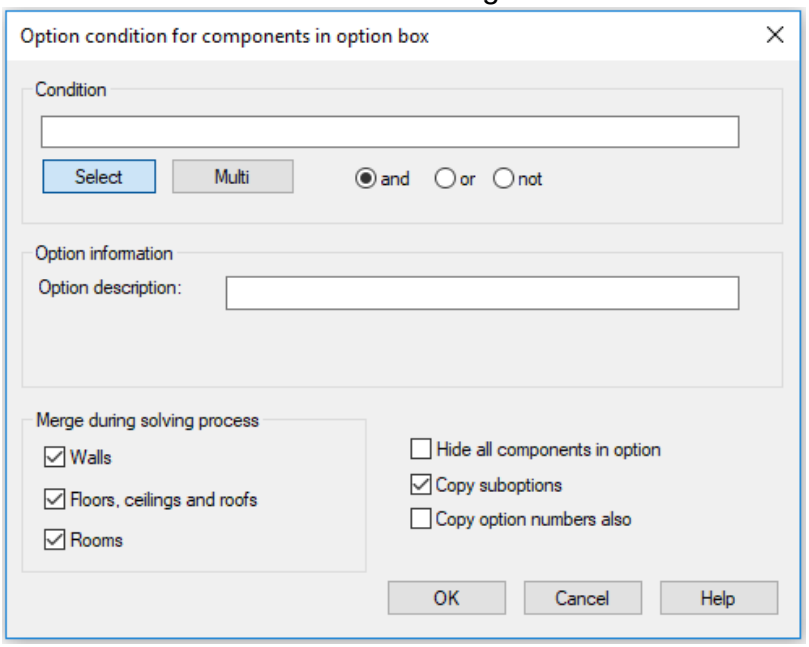
1 In the Options tab, select **Copy**.

2 Select the option box.



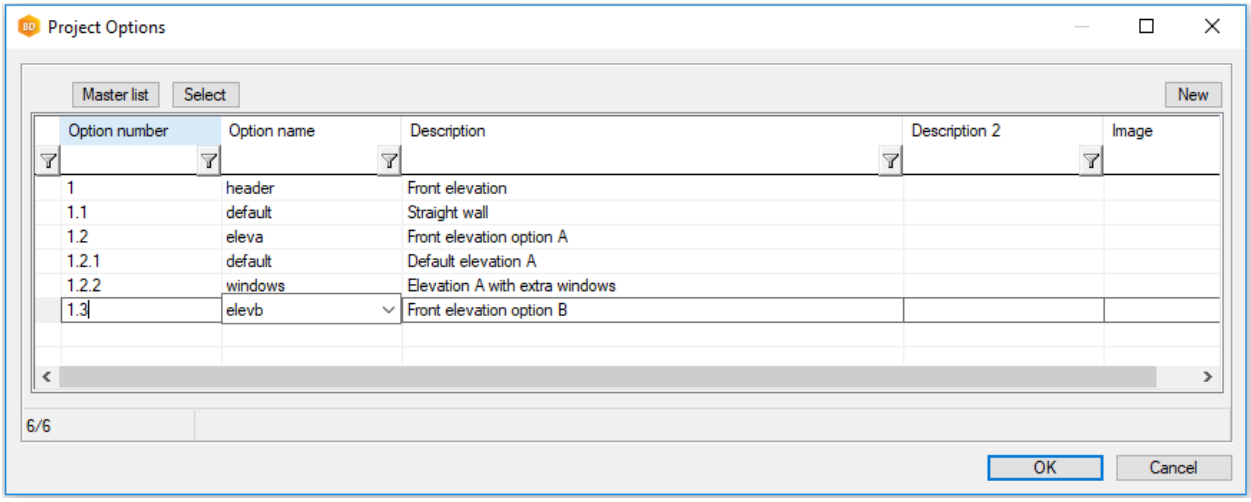
The Option Condition for Components in Option Box dialog box opens.

3 Click the Select button in the dialog box.

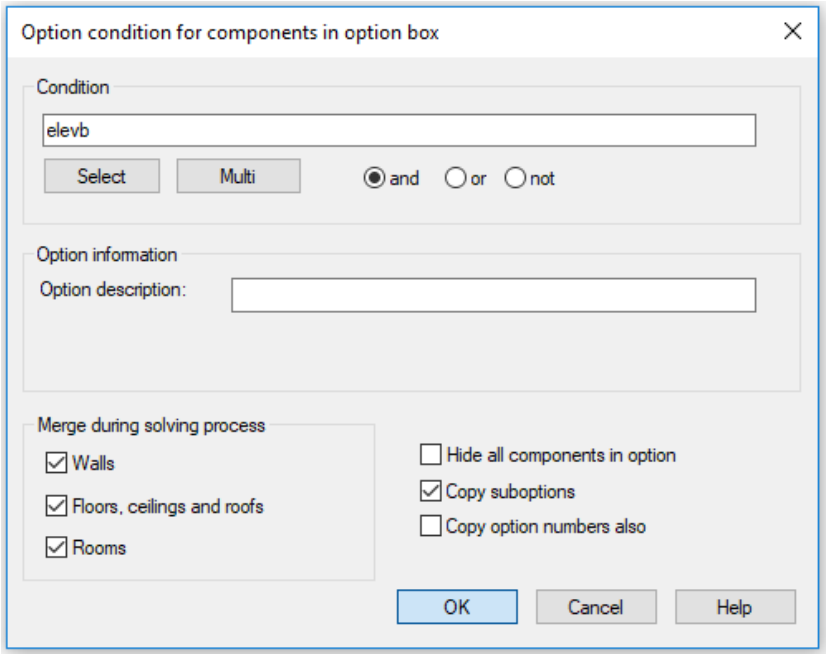


The Project Options database view opens.

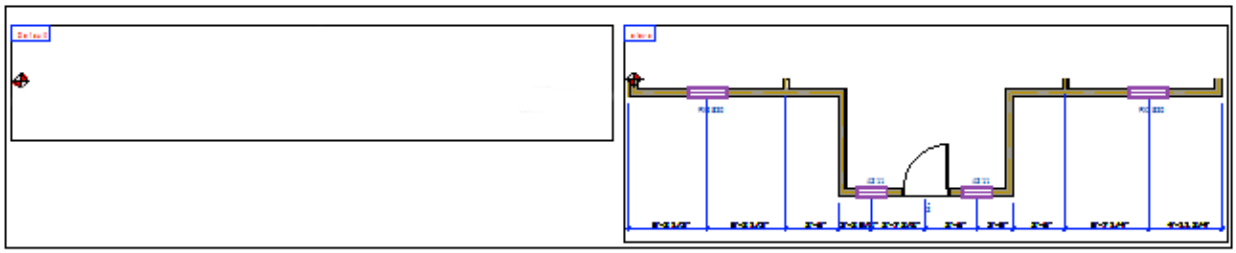
4 Move the cursor on the line **1.3 elevb** and click **OK**.



5 Click **OK** in the Option Condition for Components in Option Box dialog box.



6 Select the location for the option box. Zoom out the drawing by pressing the F7 key, for example. Place the option box far enough away from the floor plan drawing.



The program moves the components of the default option to the **default** option box, and copies the components of the **eleva** option to the floor plan.

You can now edit the floor plan drawing to create the **elevb** option.

Editing the Copied Option

In the example project, edit the elevation by changing the window and door types. You can change the opening type in the following way:

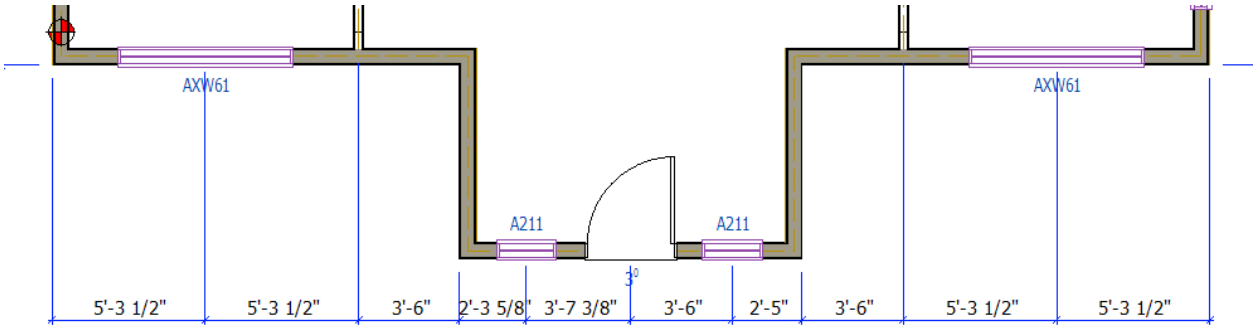
1 Quit the previous function by pressing the Esc key.

2 Select an opening.

3 Right-click to open the context-sensitive menu.

4 Select **Properties**. The Window or Door dialog box opens and you can select another opening.

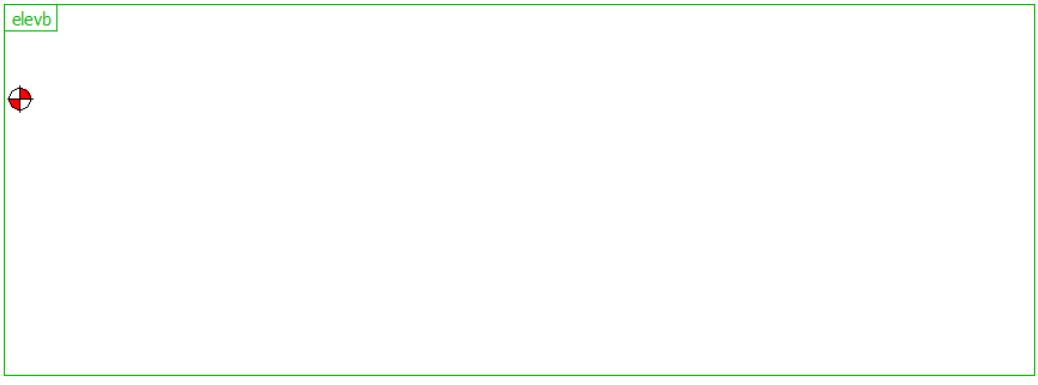
Move the openings on the floor plan, if necessary. Add new dimensions.



When the option is ready, add the components to the option. In this example, the edited windows and the door are still included in the option, as only the type of the openings was changed. However, new dimensions must be added to the option.

1 In the Options tab, select **Edit**.

2 Select the **elevb** option box.



The option box and all the objects associated to the option become highlighted in green.

3 Select the dimensions to be added to the option condition. Hold down the Ctrl key and click the dimension lines.

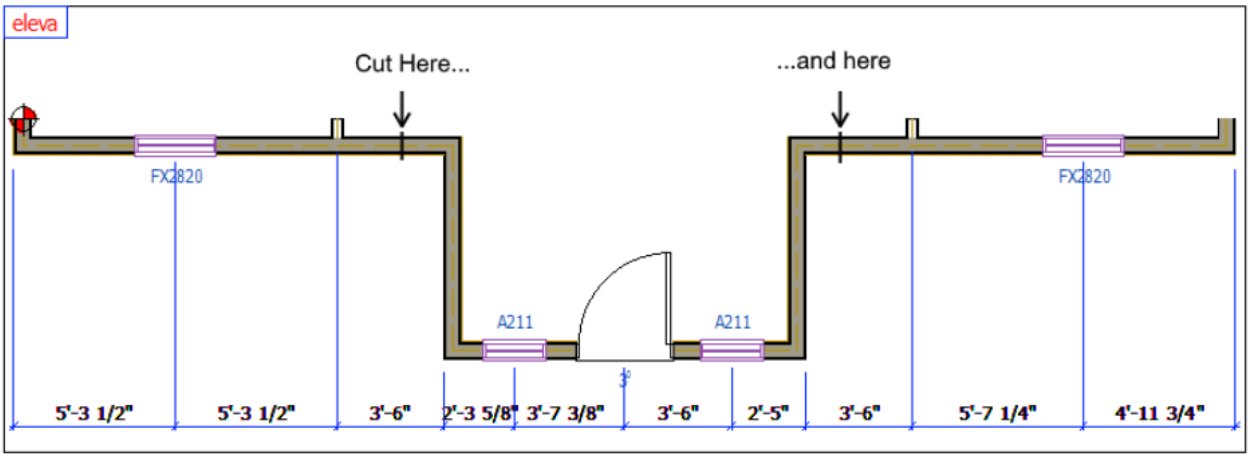
4 Select the **Confirm** function.

Creating a Sub Option

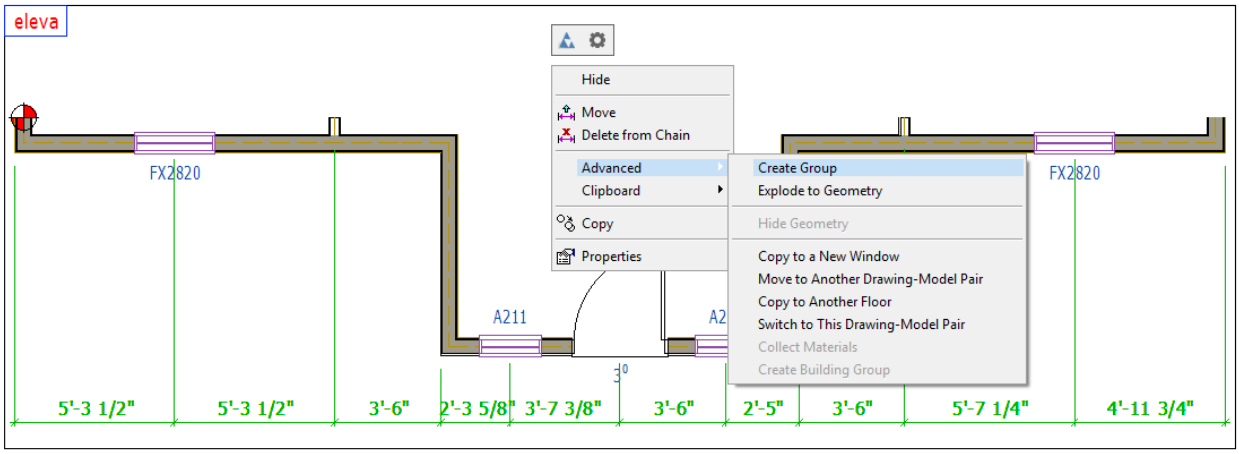
If you want to create an optional elevation by just modifying a part of an existing elevation option, you can do it by creating a sub option.

In the example project, you will create a sub option for the **eleva** option. First make sure that one of the other options, **default** or **elevb**, is activated, and all the components of **eleva** option are in the **eleva** option box. Edit the components in the **eleva** option box.

Before defining the sub option, cut the walls in the **eleva** option box as shown in the figure below.



It is also a good idea to group the dimensions together before defining the sub option. You can do this by selecting all of the dimensions in the option, right clicking, and selecting **Advanced > Create Group**.

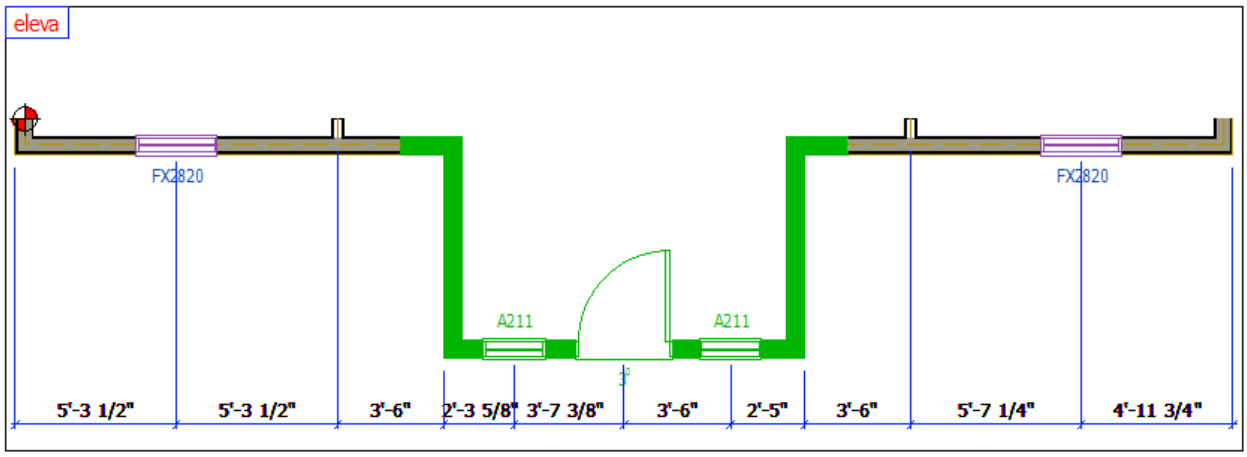


Defining the Sub Option Condition

Define the sub option in the following way:

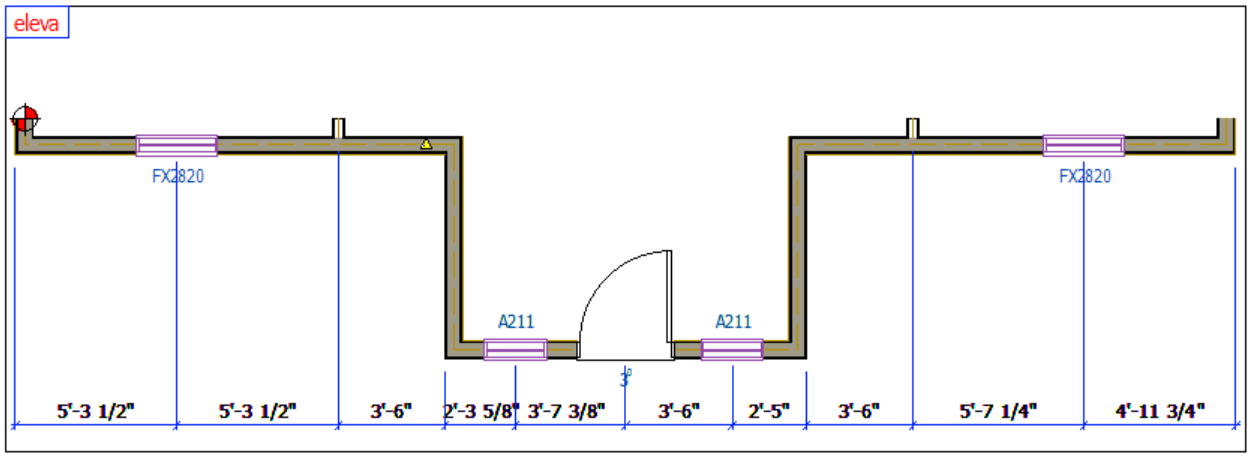
1 In the Options tab, select **New**.

2 Select the walls. Hold down the Ctrl key while clicking.



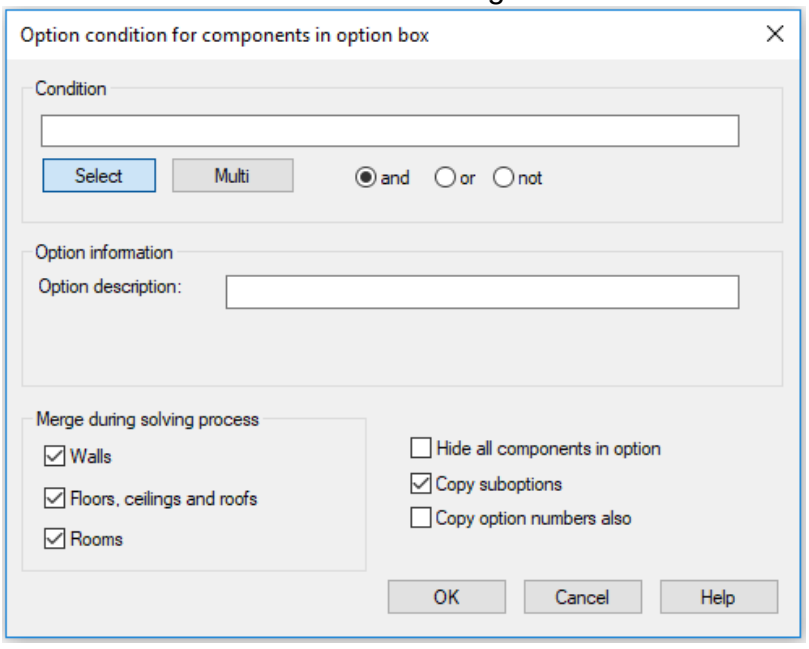
3 Select the **Confirm** function.

4 Select the origin point. Click the point shown in the following figure.



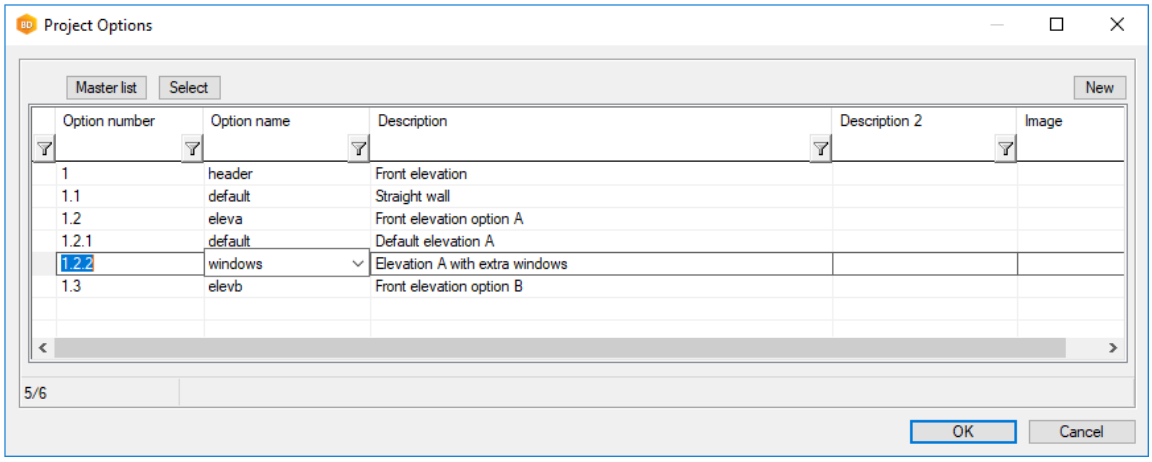
The Option Condition for Components in Option Box dialog box opens.

5 Click the **Select** button in the dialog box.

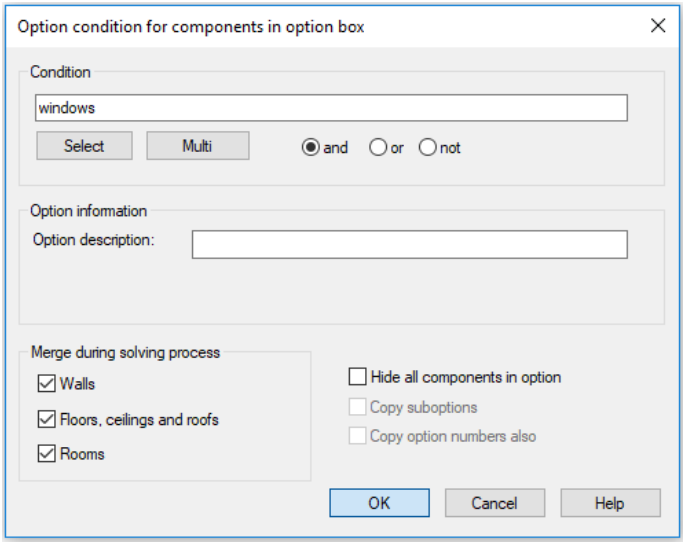


The Project Options database view opens.

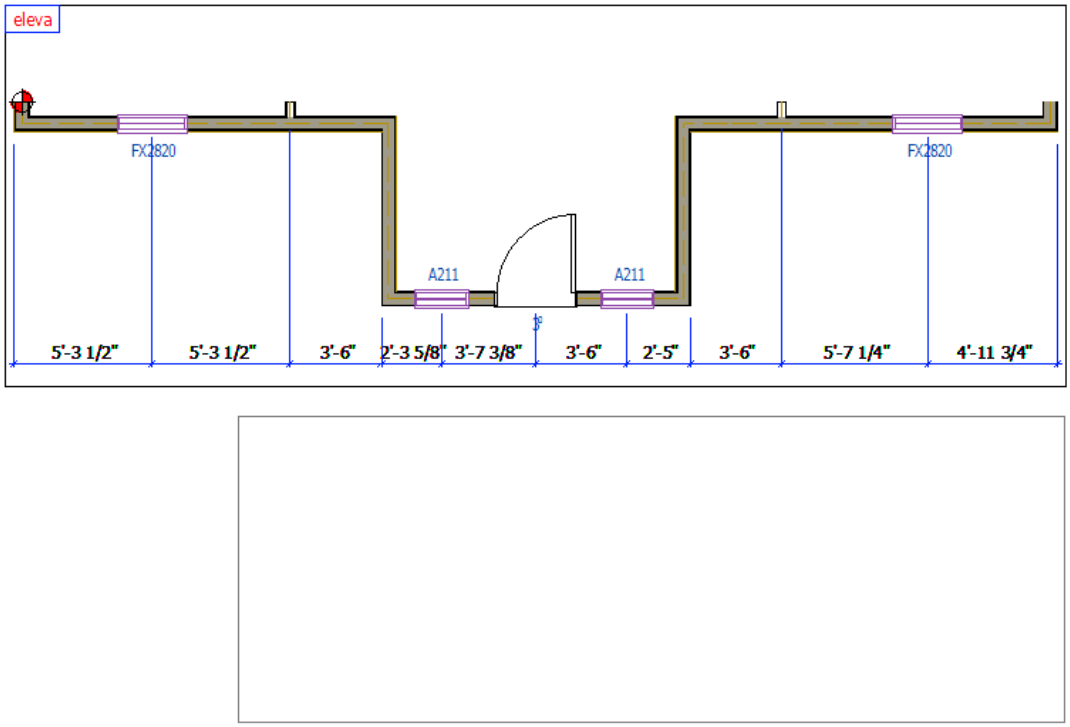
6 Move the cursor on the line **1.2.2 windows** and click **OK**.



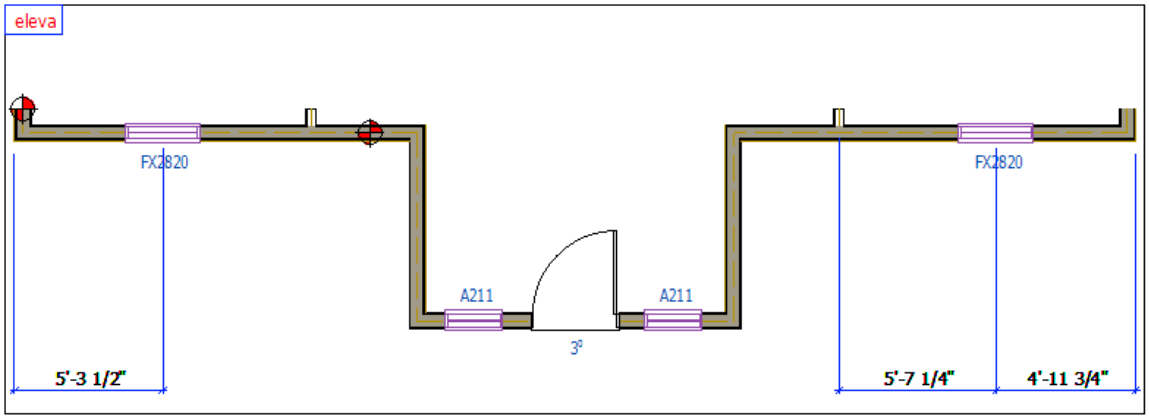
7 Click **OK** in the Option Condition for Components in Option Box dialog box.

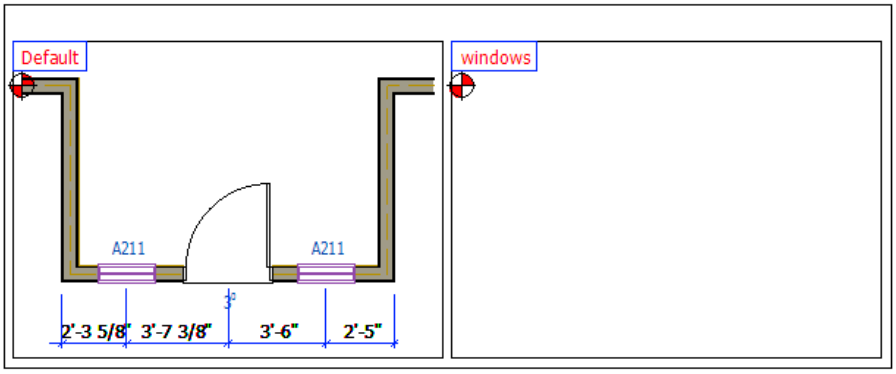


8 Select the location for the option box. Zoom out the drawing by pressing the F7 key, for example.



The program copies the selected walls to the **default** sub option box. If necessary, re-add any dimensions that got moved from the eleva option box to the Default sub option box.

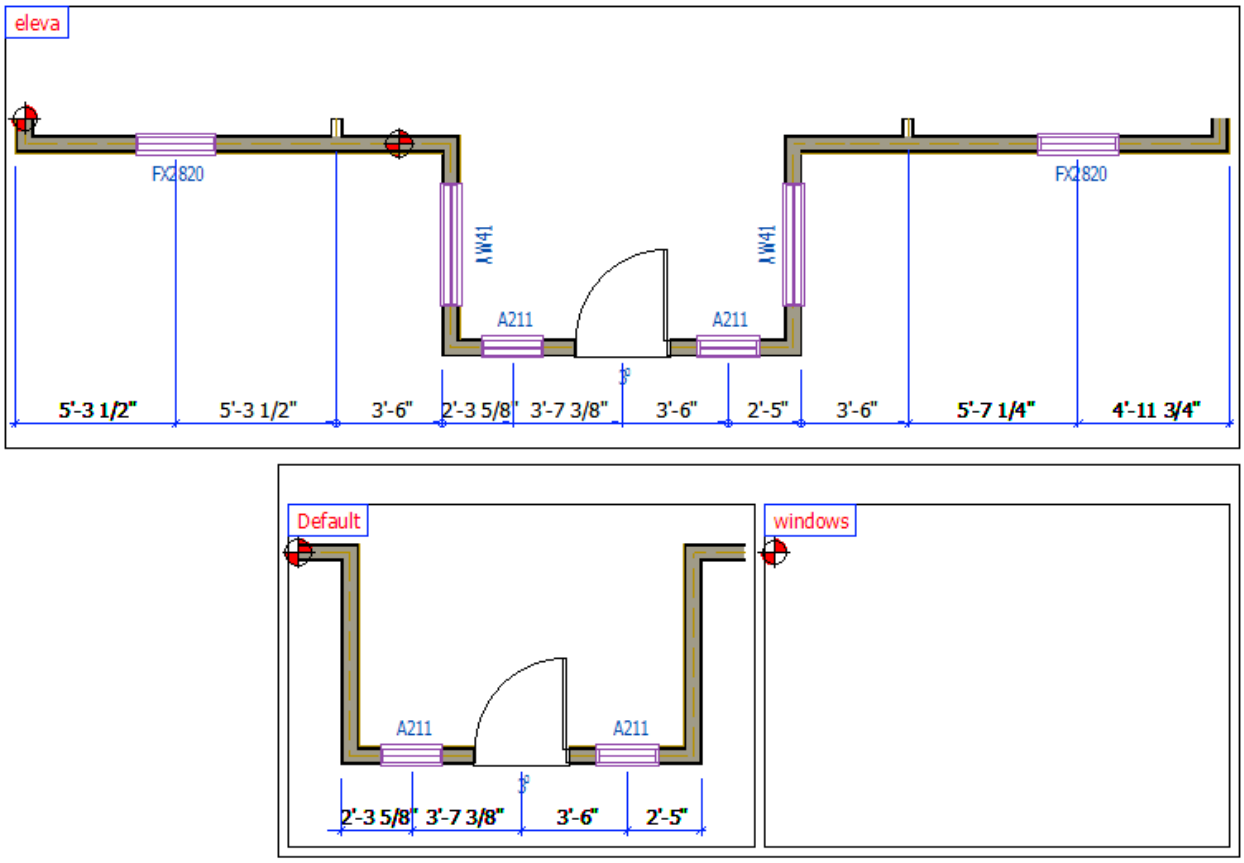




You can now edit the walls in the **eleva** option box to design the **windows** sub option.

Editing the Configuration of the Sub Option

In the example project, add two windows to the **windows** sub option. Edit the walls in the **eleva** option box.



Use the **Edit** function to add the components to the **windows** option.

Editing Other Drawing-Model Pairs

To solve an option correctly, all drawing-model pairs that are affected by the option must be modified. In the example project, you will add an option to the Foundation, 1st Level Deck Layout and Roof drawing-model pairs reflecting the changes made in the 1st Level Wall Layuot drawing-model pair.

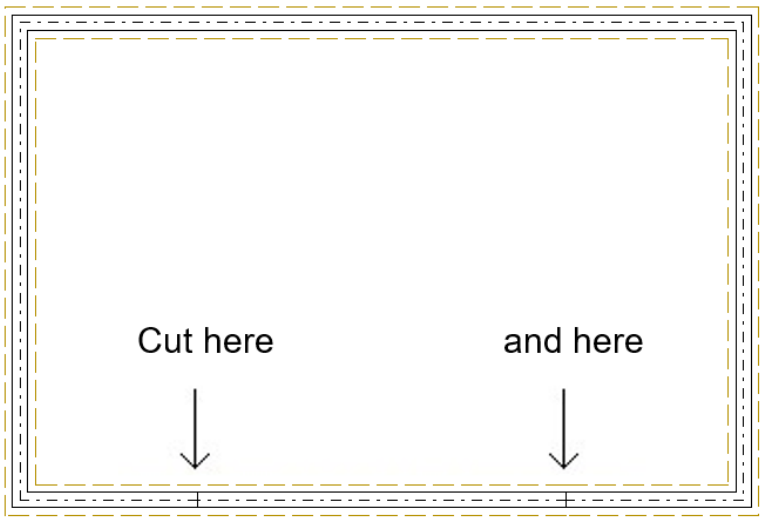
Editing the Foundation

As the wall layout of the elevation options **eleva** and **elevb** are alike, you can use the same foundation option for both elevations.

Before you start, make sure the elevation option **eleva** or **elevb** is active in the 1st Floor Walls drawing-model pair.

1 Open the Foundation drawing-model pair. Press F4 and select **Foundation** from the button menu. The 1st floor walls should be visible as a reference drawing in the drawing window.

2 Cut the front wall of the foundation at the approximate points shown in the figure below. After you have solved the options, the walls will merge so the cut lines will not be visible.



3 In the Options tab, select **New**

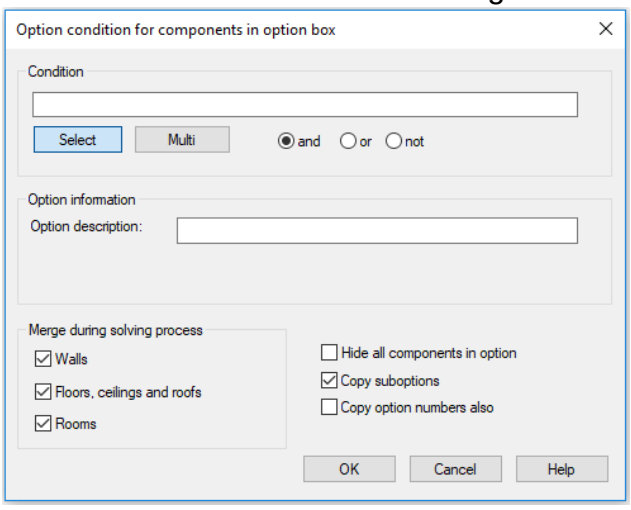
4 Select this part of the foundation wall.

5 Select the **Confirm** function.

6 Select the origin point. Click the point shown in the next figure.

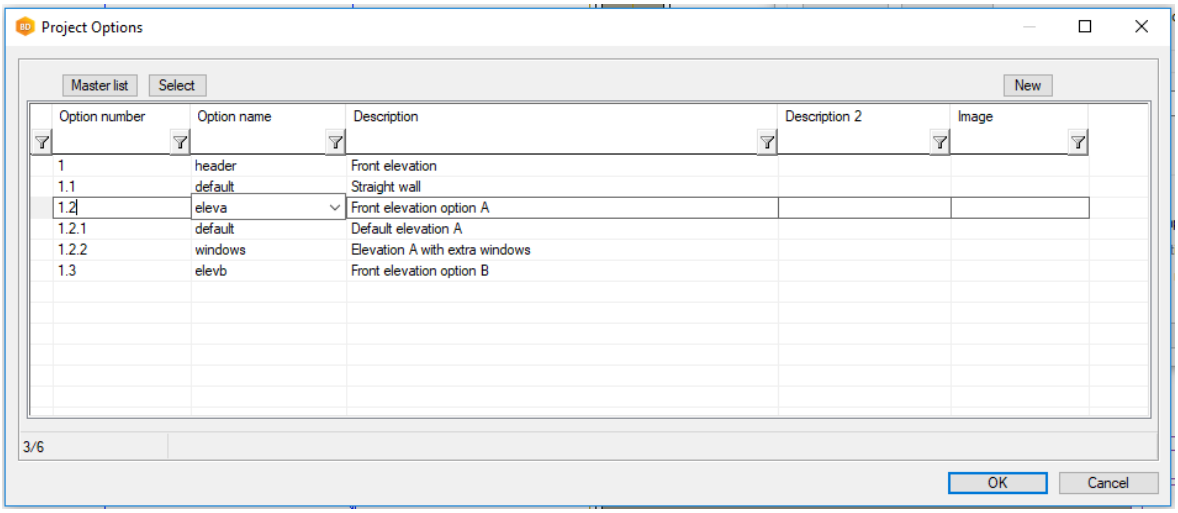
The Option Condition for Components in Option Box dialog box opens.

7 Click the **Select** button in the dialog box.

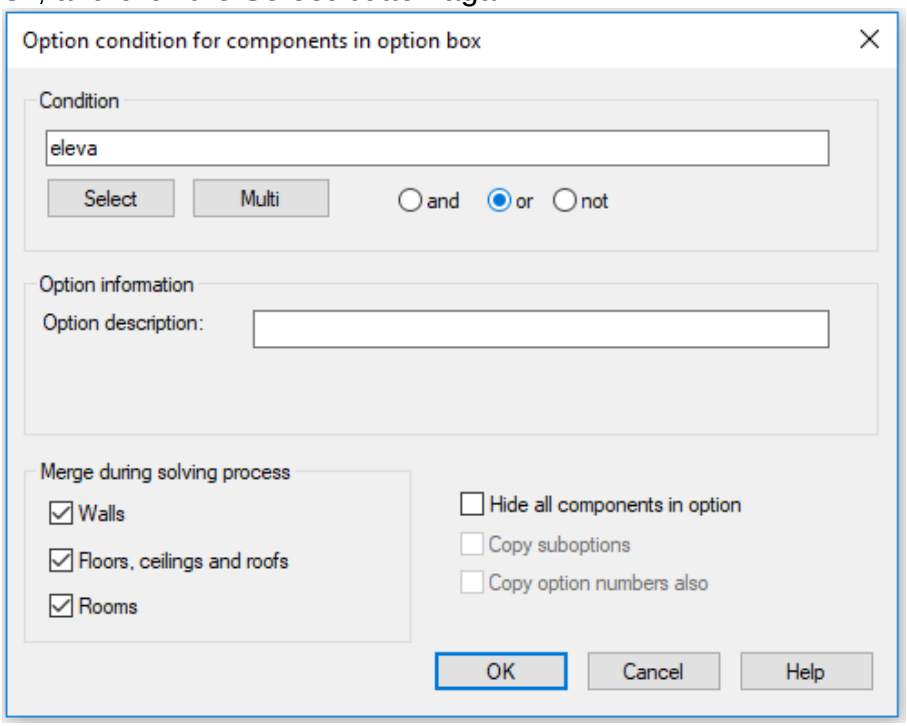


The Project Options database view opens.

8 Move the cursor on the line **1.2 eleva** and click **OK**.

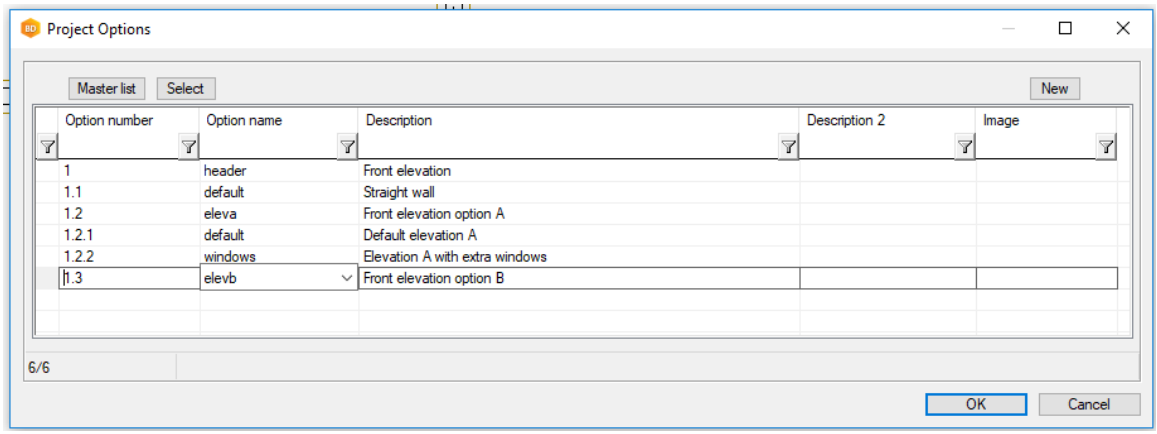


9 In the Option Condition for Components in Option Box dialog, select the radio button **Or**, and click the **Select** button again.

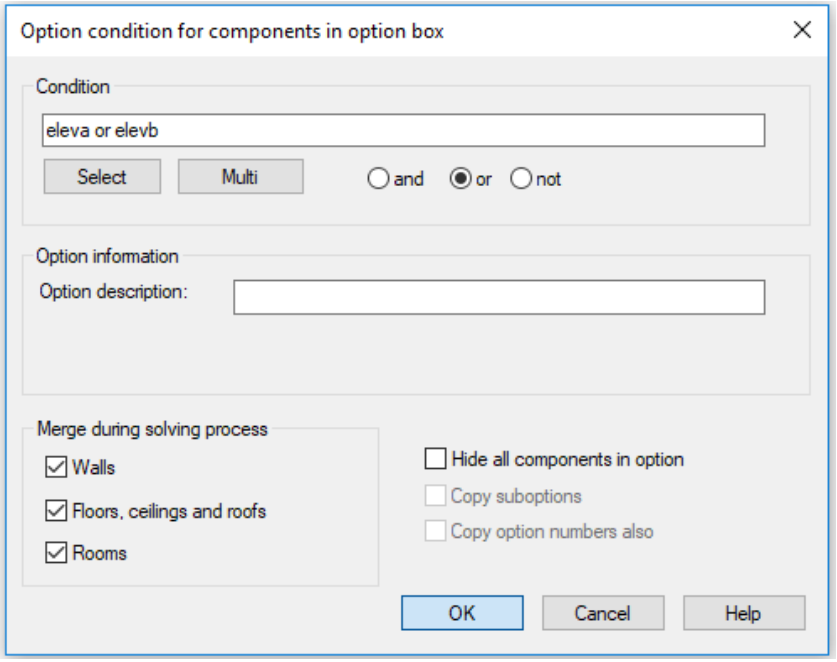


The Project Options database view opens again.

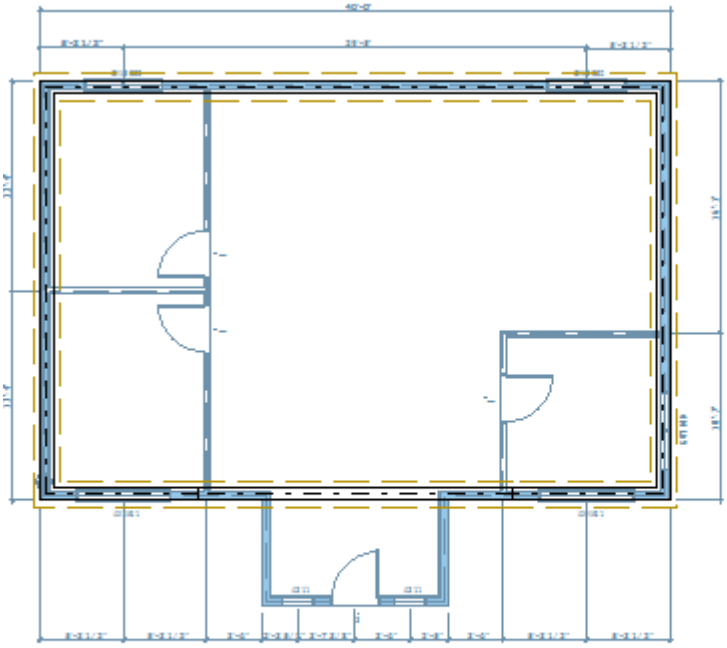
10 Move the cursor on the line **1.3 elevb** and click **OK**.



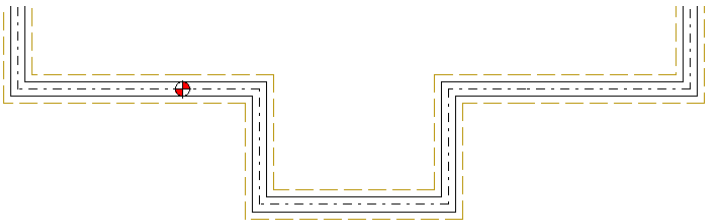
11 Click **OK** in the Option Condition for Components in Option Box dialog box.



12 Select the location for the option box.



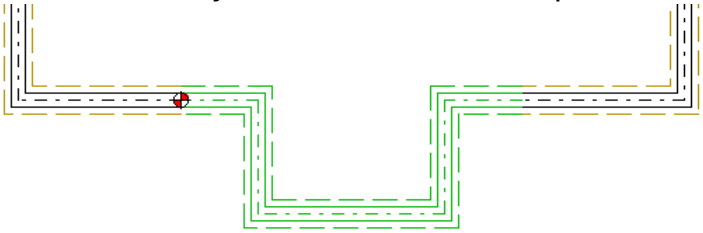
13 Edit the foundation walls according to the elevation options of the 1st floor.



14 In the Options tab, select **Edit**

15 Select the **eleva or elevb** option box.

16 Select the walls you want to add to the option.

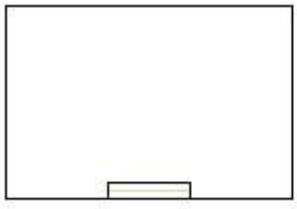


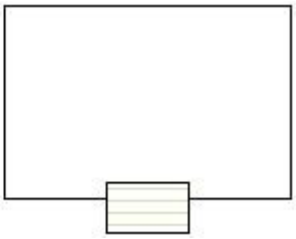
17 Select the **Confirm** function.

Editing the Floor

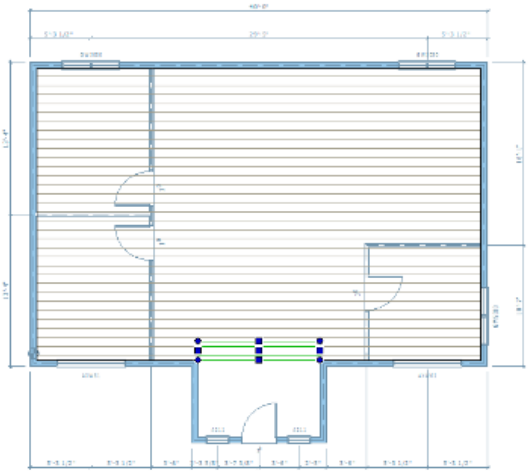
Open the drawing-model pair of the 1st Level Deck Layout and create a floor option you can use for both **eleva** and **elevb** elevation options. Use the **Or** operator when setting the option conditions as you did in the Foundation drawing-model pair.

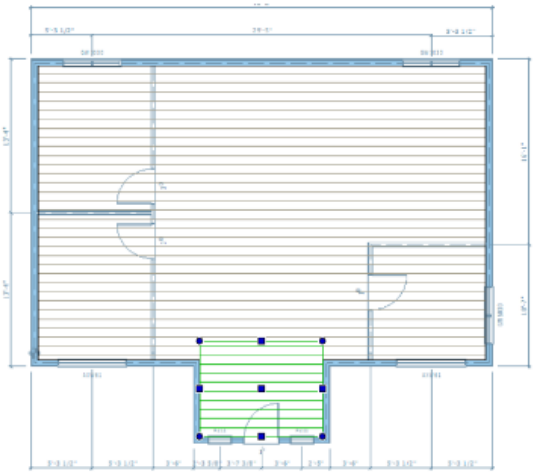
You can create the floor option by cutting the floor into two areas, and add just the smaller area to the option. Edit the area by moving its edge. When you solve the options, the areas will be merged.

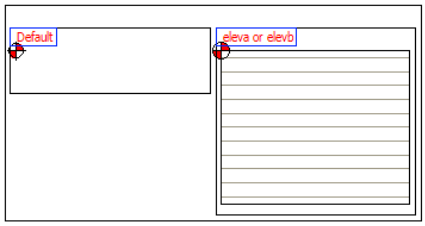




Click on the floor and select the **Clip** function in the Plane Structure tab to cut the floor area. Select the smaller floor section and move the edge until it matches the outline of the house







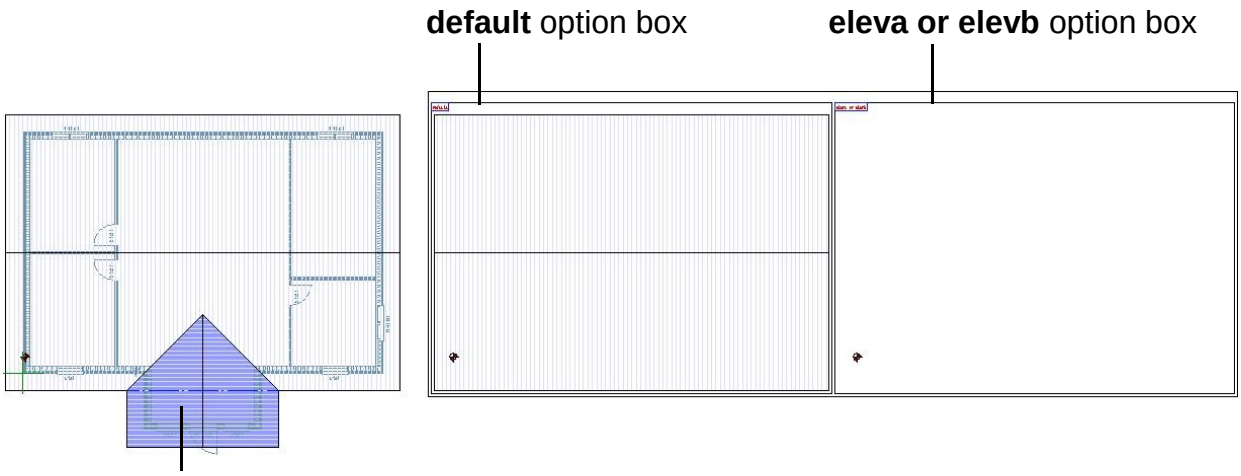
Editing the Roof

Open the Roof drawing-model pair and create an option you can use for both **eleva** and **elevb** elevation options. When creating the roof option, it is not necessary to cut the links between the walls and the roof.

Before you start designing the roof option, make sure that either of the elevation options **eleva** or **elevb** is activated in the drawing-model pair of the 1st floor walls.

When you create a new option, select both slopes of the default roof to be included in the option. When you set the option conditions, use the **Or** operator as you did in the Foundation drawing-model pair.

Add the crossing roof according to the walls of the elevation option **eleva** or **elevb**, and add the new slopes to the option by editing the option components.



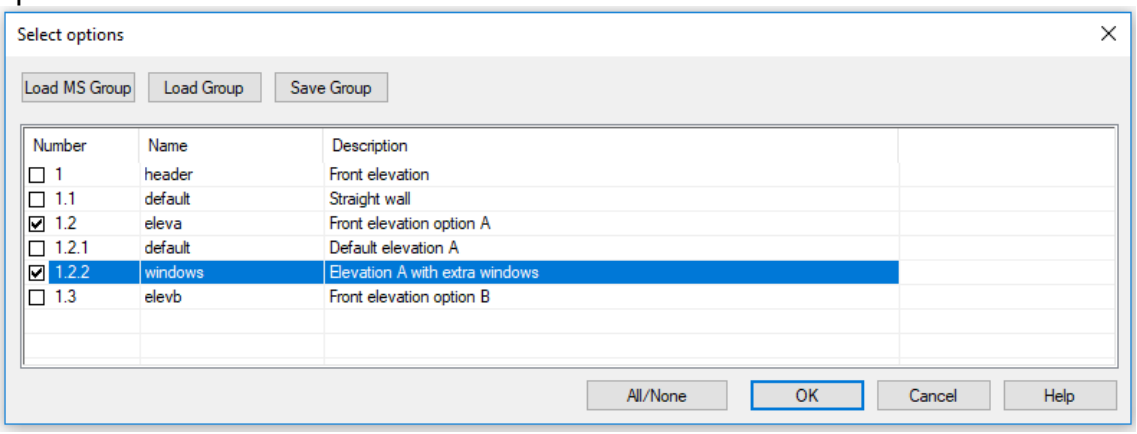
Add the crossing roof and combine it with the slope of the main roof

Activating All Options With the Same Name

After you have modified all the drawing-model pairs, check the options to ensure that they work correctly. You can easily activate all options with the same name in all drawingmodel pairs as follows:

1 In the Options tab, select **New >** **Test**. The Select Options list opens.

2 Select the options to be processed by selecting the check box in front of the option number. For example, select the option **1.2 Front elevation option A** and its sub option **1.2.2 Elevation A with extra windows**.



3 Click OK. The selected options will be activated in all drawing-model pairs.

Stretching Wall Exterior Sidings to the Roof

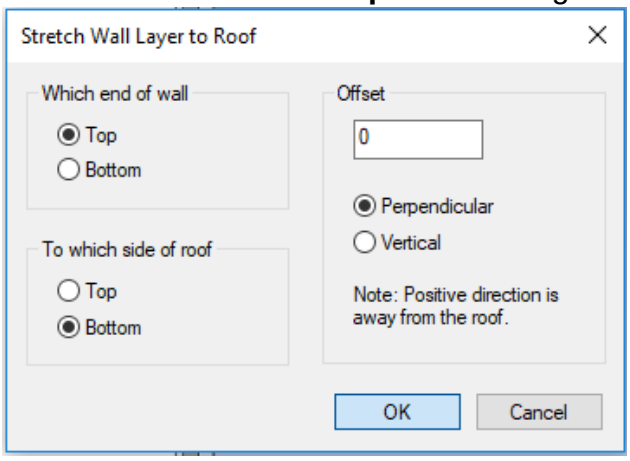
Activate the model window, and check the stretching of wall exterior sidings to the roof. Activate each option in turns as described before, and check the stretching of exterior sidings to the option roof in the model window.

1 Select the wall, right click, and select **Stretch to Roof**.

2 Select the roof slopes to which the sidings will be stretched.

3 Select the **Confirm** function. The Stretch Wall Layer to Roof dialog box opens.

4 Select the radio button **Top** in the dialog box, and click OK.



When you first created the building and stretched the walls to the default roof, the program created a link between the walls and the roof. To enable the correct stretching of the walls when you solve the options, you will need to connect the gable and side walls also to the option roof. Stretch the walls to all the four roof slopes as shown in the next figure.

Note: The side walls have been cut. Stretch the cut walls as well.

Moving Option Boxes And Components Inside Them

You can move the option boxes and the components inside the boxes to place the options with the same option condition on top of each other in different drawing-model pairs.

Moving the Option Box

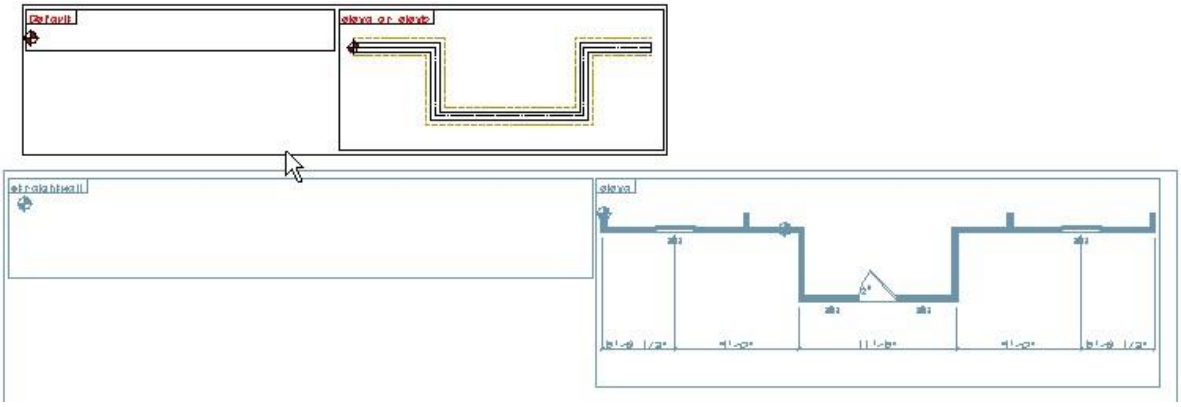
1 Activate the default structure to move the option components to the option boxes.

In the Options tab, select **New >** **Test**, and select the option **1.1 Straight wall** as the option to be processed.

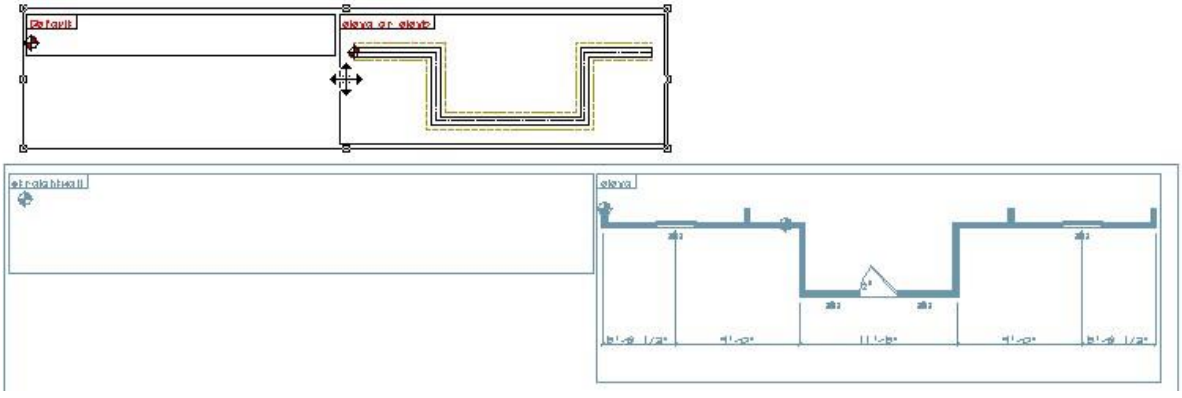
2 Open the Foundation drawing-model pair. The 1st floor walls should be visible as a reference drawing in the drawing window.

3 In the Options tab, select **Size**.

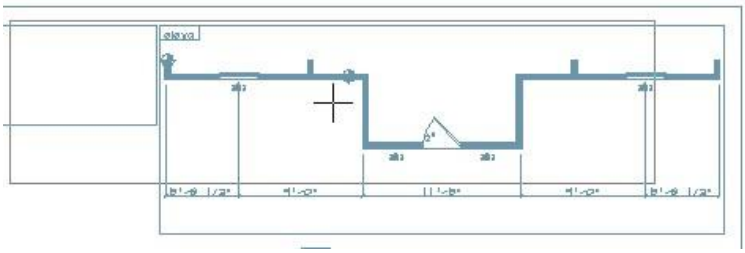
4 Click the edge of the option fence around the option boxes to move all the option boxes of the structure in question.



5 Click the snap point in the middle of the fence.



6 Select the new location. Place the option fence approximately on the corresponding fence in the reference drawing.



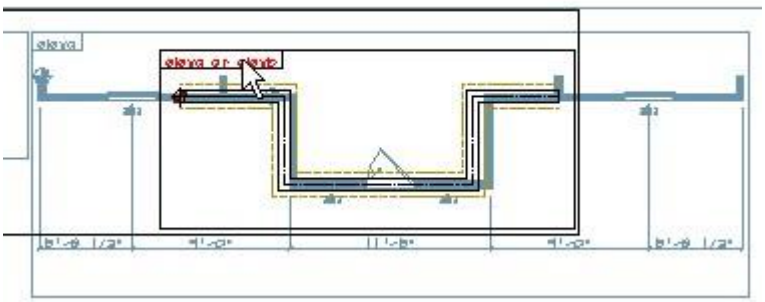
7 Press the Esc key to quit the function.

During the next steps, you will move the components exactly on top of the components in the reference drawing.

Moving the Components Inside the Box

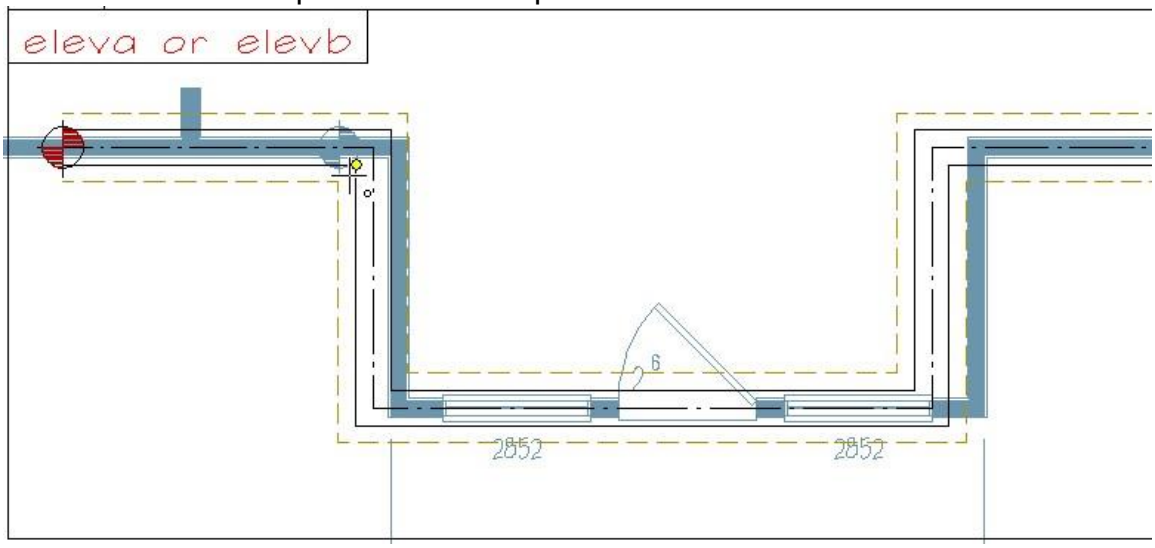
1 Select **Option System > Move Origin in Option Box**.

2 Select the option box.

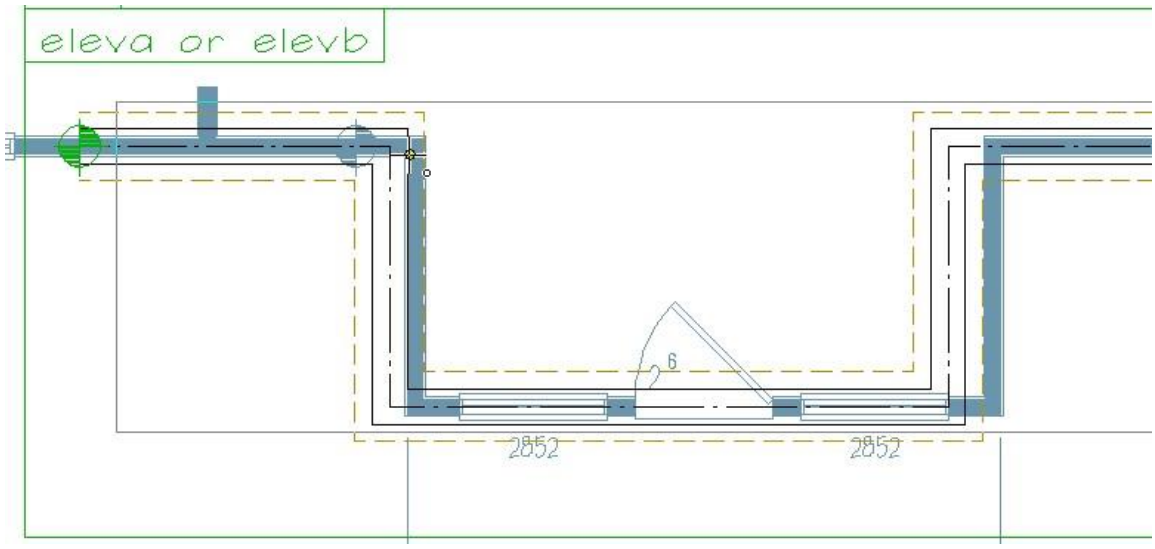


3 Click the **REFPOINT** button above the status bar. If you cannot see the button, stretch down the bottom edge of the Vertex window.

4 Select the reference point for the components to be moved.



5 Select the new location. Select a point of the reference drawing.



6 Press Esc to quit the function.

Optional Opening Trims

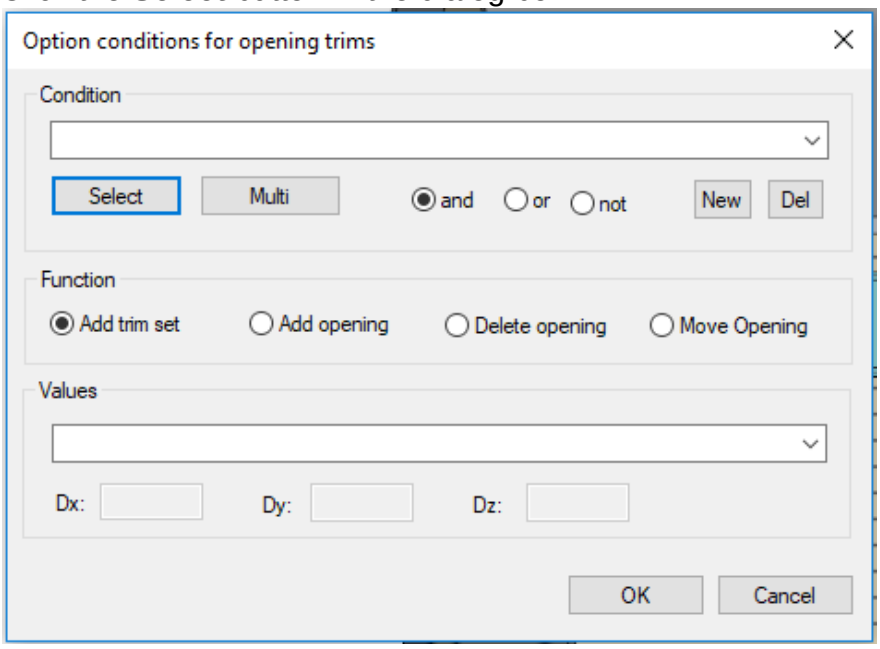
If you want to have several opening trim alternatives, you don't have to define a new elevation option for each trim type. You can add one trim type to the openings in the building model, and then define the other alternatives in the following way:

1 Open the 1st Level Wall Layout drawing-model pair and activate the 3D model window.

2 In the Options tab, select **New >** **Edit Option Data**.

3 Select a window. You can only select one window at a time. The Option Conditions for Opening Trims dialog box opens.

4 Click the **Select** button in the dialog box.

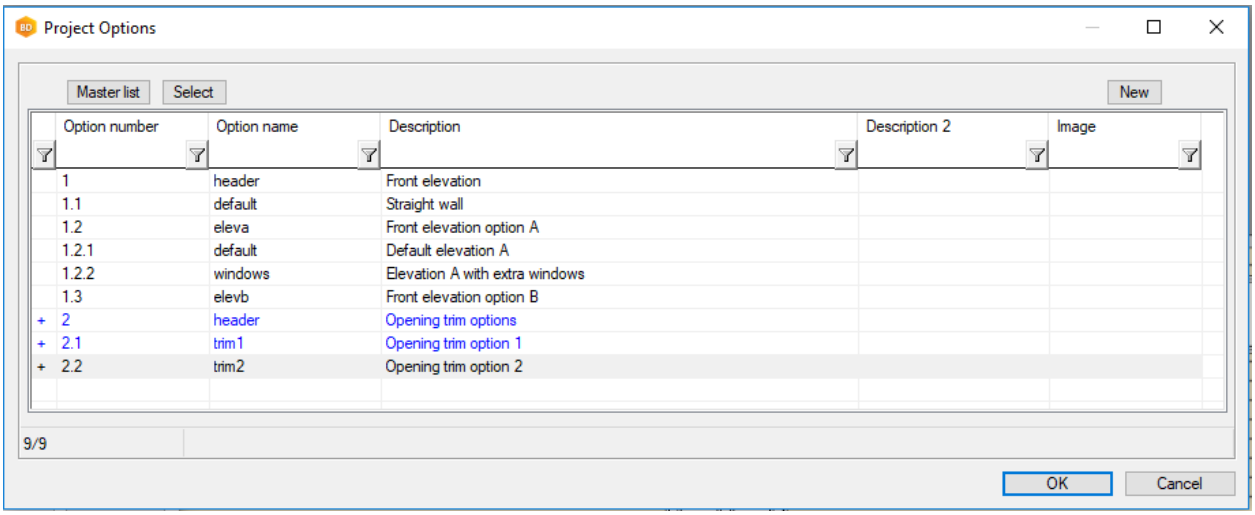


The Project Options database view opens.

5 Add 3 new lines to the database and fill in the following data:

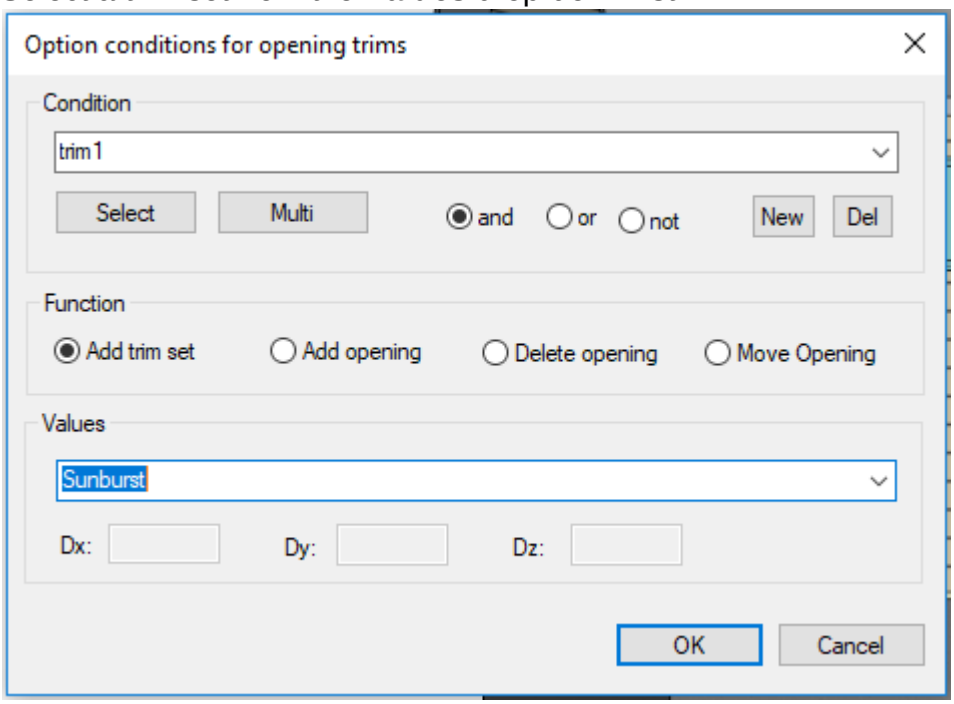
Order	ID	Name
2	header	Opening trim options
2.1	trim1	Opening trim option 1
2.2	trim2	Opening trim option 2

The database view should now look like this:



6 Move the cursor on the line **2.1 trim1** and click **OK**. The Option Conditions for Opening Trims dialog box opens again.

7 Select a trim set from the **Values** drop-down list.



8 To define another optional trim set, click the **New** button in the dialog box. The fields in the dialog will be cleared.

9 Click the **Select** button. The Project Options database view opens.

10 Move the cursor on the line **2.2 trim 2** and click **OK**.

11 Select another trim set from the **Values** drop-down list.

12 Click **OK** in the Option Conditions for Opening Trims dialog box.

Repeat the procedure to all the openings you want to add optional trims. The window may be located in the original model or in one of the option boxes. You can later change the trim sets you selected with the same editing tool.

Note: The optional trims will be added to the openings when you solve the option.

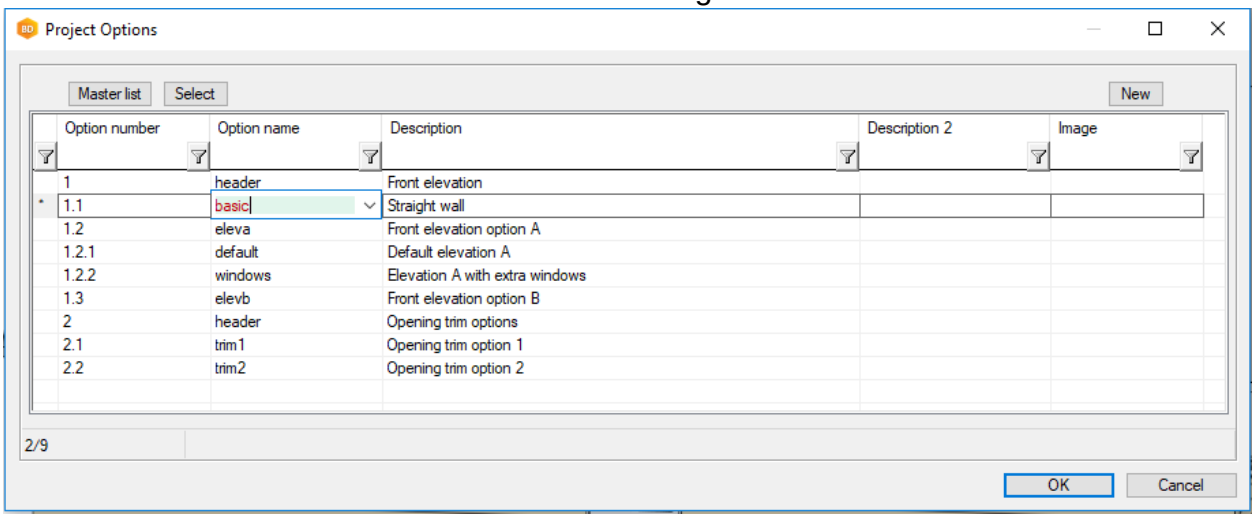
Note: You can use the same method to define different wall type alternatives for an elevation option.

Editing the Option Id

You can edit the option information at any time during the design process. In the example project, change the option ID of the default front elevation. First change the ID in the Options database, and then refresh the ID in the floor plan.

1 In the Options tab, select **Project Options > Project Options**.

2 Move the cursor on the line **1.1 default** and change the ID to **basic**.



3 Click **OK** in the Project Options database view.

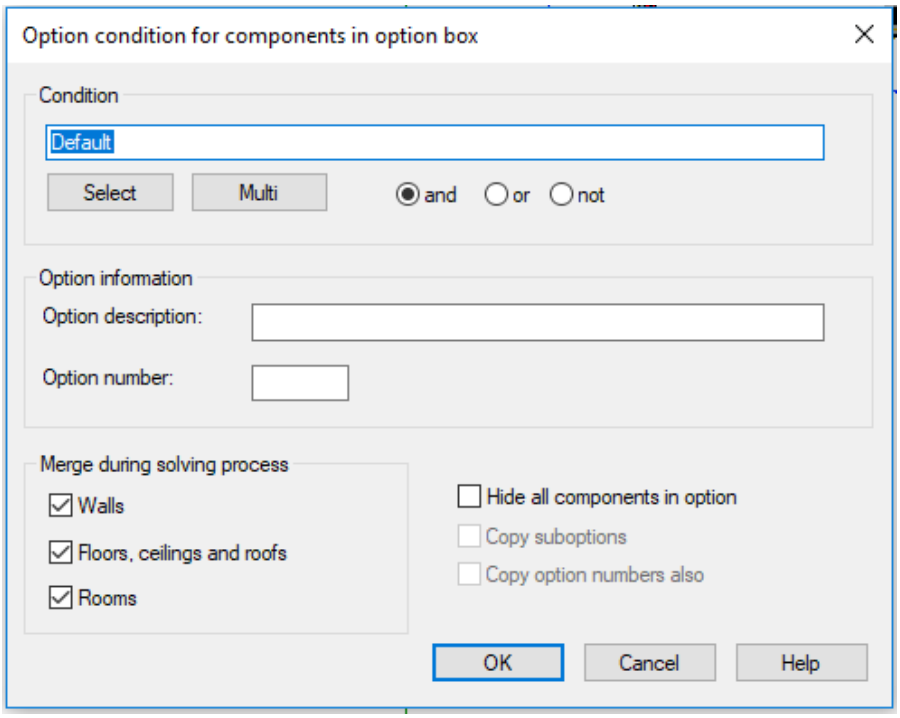
Note: In order for the option to work correctly after the ID has been changed, be sure to perform the following steps:

4 Inthe Options tab, select **New > Edit Option Data**

5 Select the **Default** elevation option box.

6 The Option Condition for Components in Option Box dialog box opens.

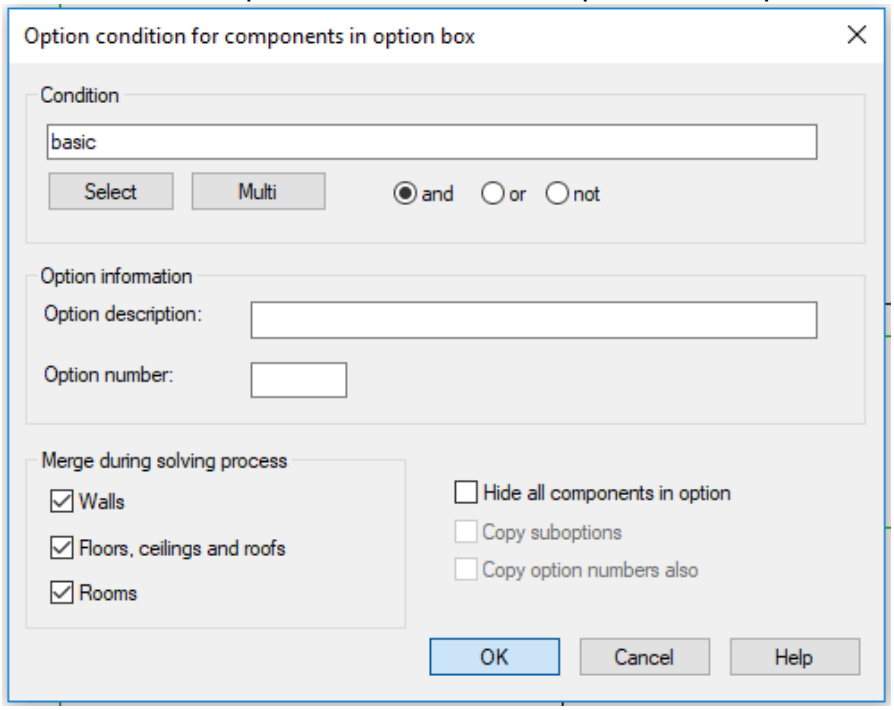
7 Select the text **Default** and press Delete.



8 Click the **Select** button in the dialog box. The Project Options database view opens.

9 Move the cursor on the line **1.1 basic** and click **OK**.

10 Click OK in the Option Condition for Components in Option Box dialog box.



11 The ID is refreshed in the floor plan drawing.

Defining Option Rules

When you test or solve the options of the building, you select the options to be processed from the Select Options list. All the available options for the project are displayed in the list. On the list, there may be options which cannot be selected at the same time with another option, or options which require another option to be processed at the same time.

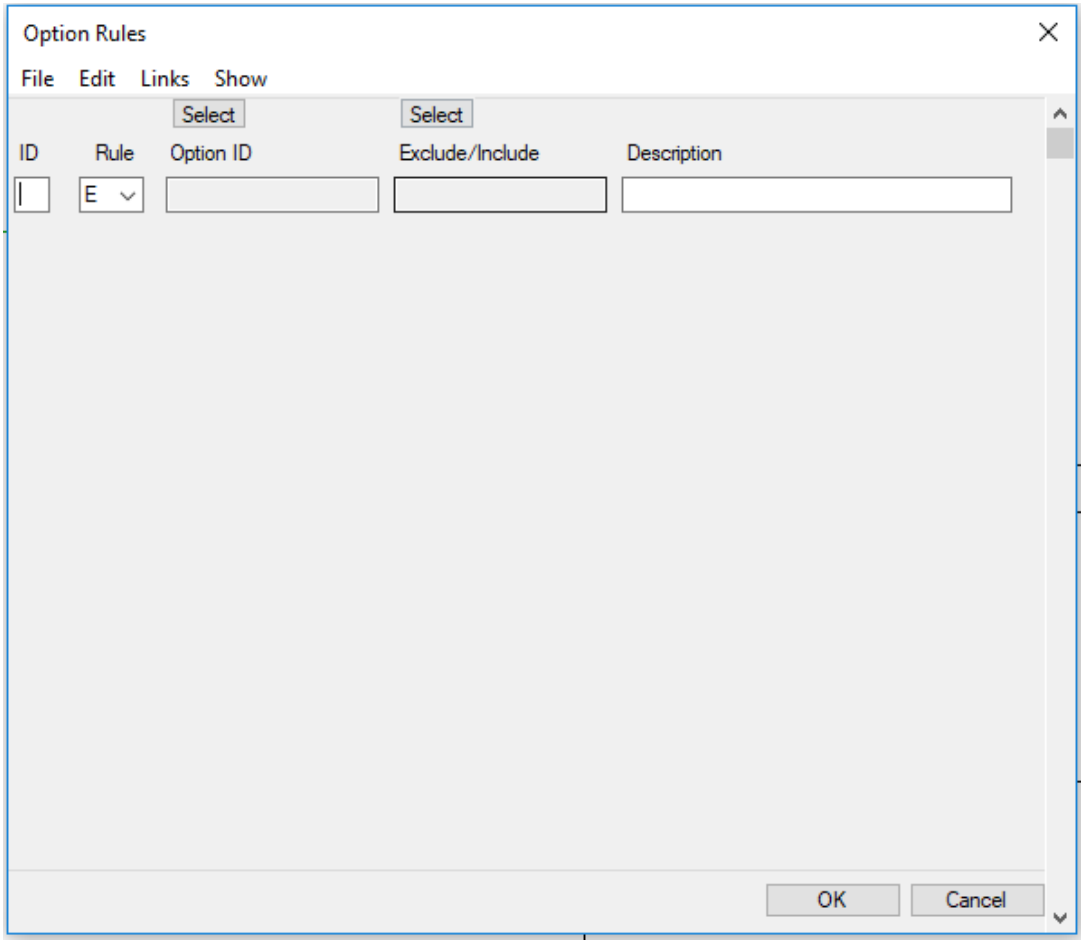
You can control the selection of options by defining option rules.

Rule	Option ID	Exclude/Include	Result when selecting the options
Exclude	A	B	If you select option A, option B becomes automatically deselected.
Include	A	B	If you select option A, option B becomes automatically selected.

Set the option rules for the example project in the following way:

1 In the Options tab, select **Project Options >** **Option Rules**. The Structural Option Rules database view opens. The template database is empty.

2 Add a line to the database by pressing Shift+Insert. The default value in the **Rule** field is E = Exclude.



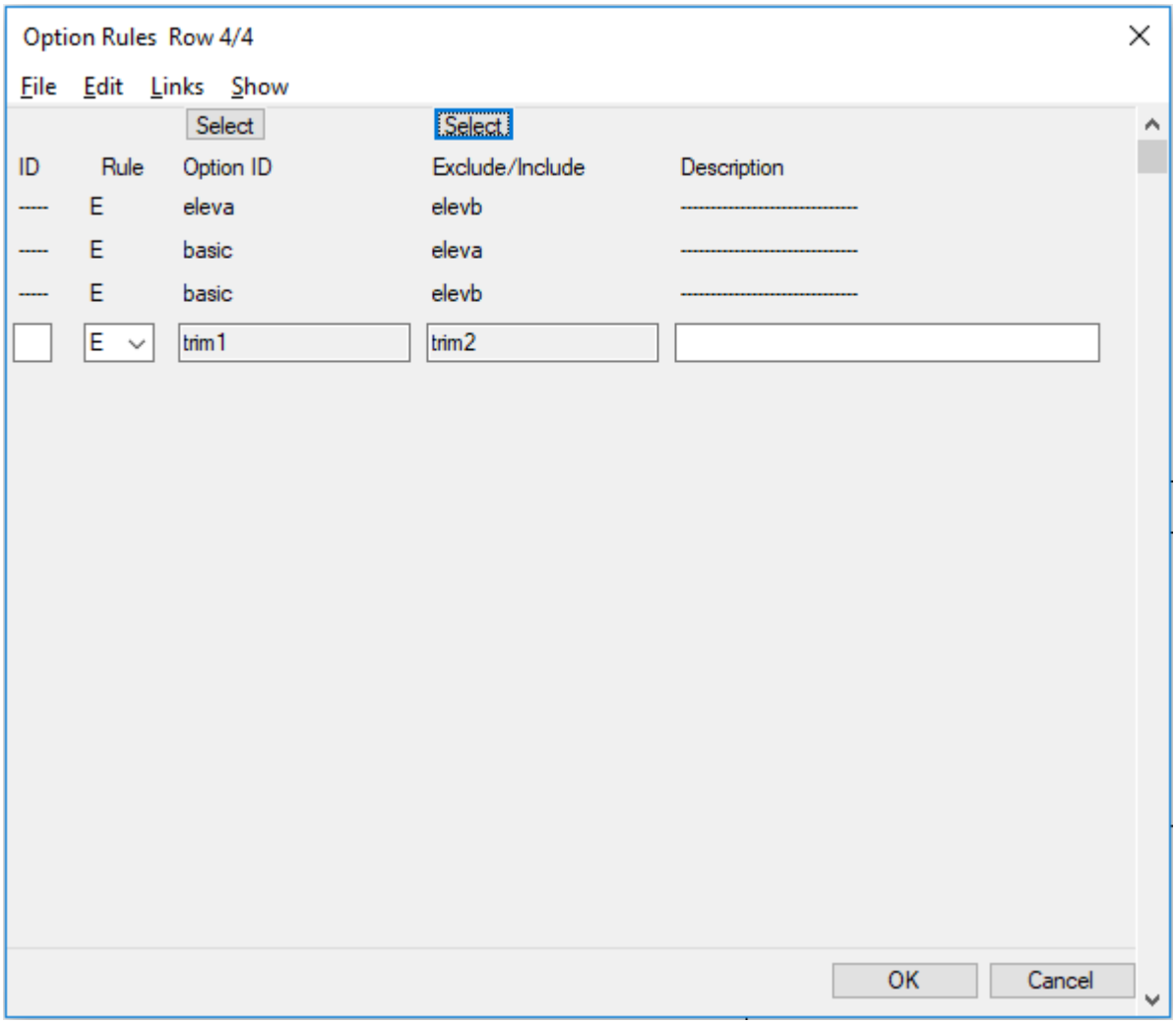
3 Click the **Select** button above the **Option ID** field. The Project Options database view opens.

4 Move the cursor on the line **1.1 basic** and click **OK**.

5 Click the **Select** button above the **Exclude/Include** field. The Project Options database view opens again.

6 Move the cursor on the line **1.2 eleva** and click **OK**.

7 Repeat the procedure for as many rules to be set. You can set following rules, for example:



8 Click **OK** to save and close the database.

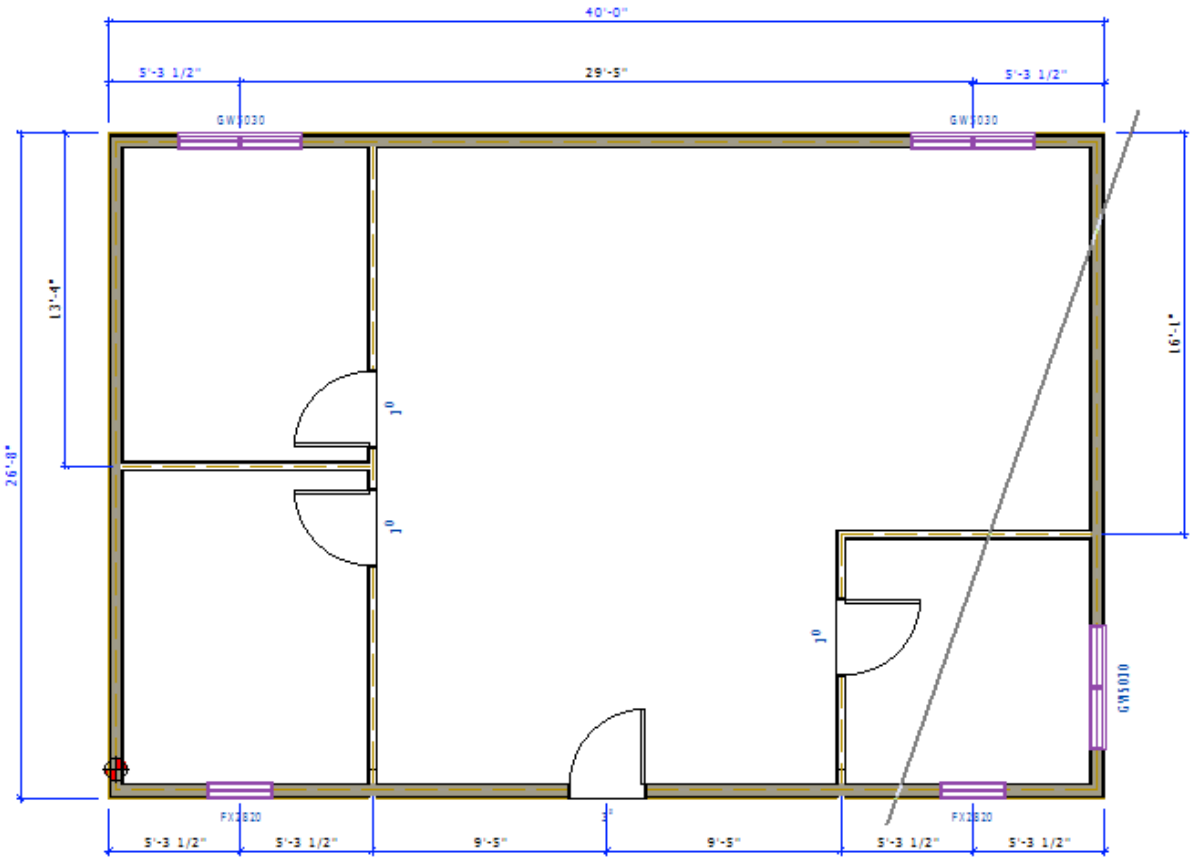
Stretching a Building

Using the options function, you can stretch a single plan or the whole building in the X axis or Y axis direction.

Define the stretch option to the example building in the following way:

1 In the Options tab, select **Stretch >** **Define**.

2 Select the corner points of the area you want to stretch.

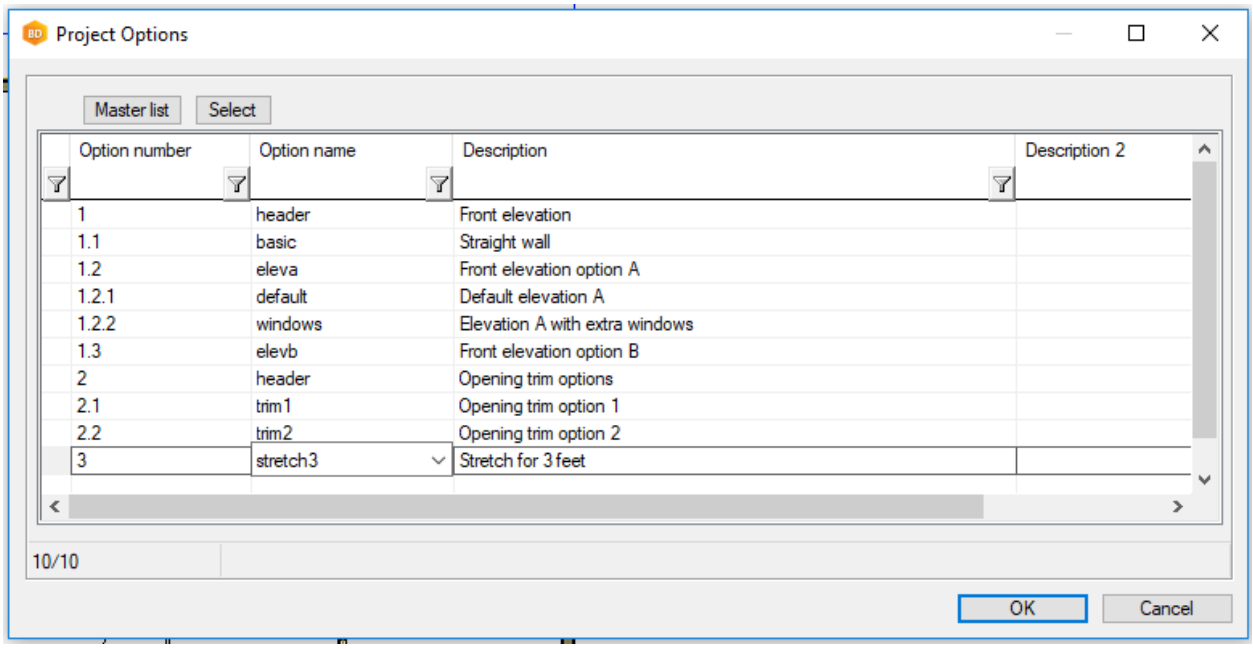


Note: When you solve the stretch option, the dimensions will be refreshed even if the dimension lines were left outside the stretch area.

3 Select the **Confirm** function. The Option Condition for Components on Stretch Area opens.

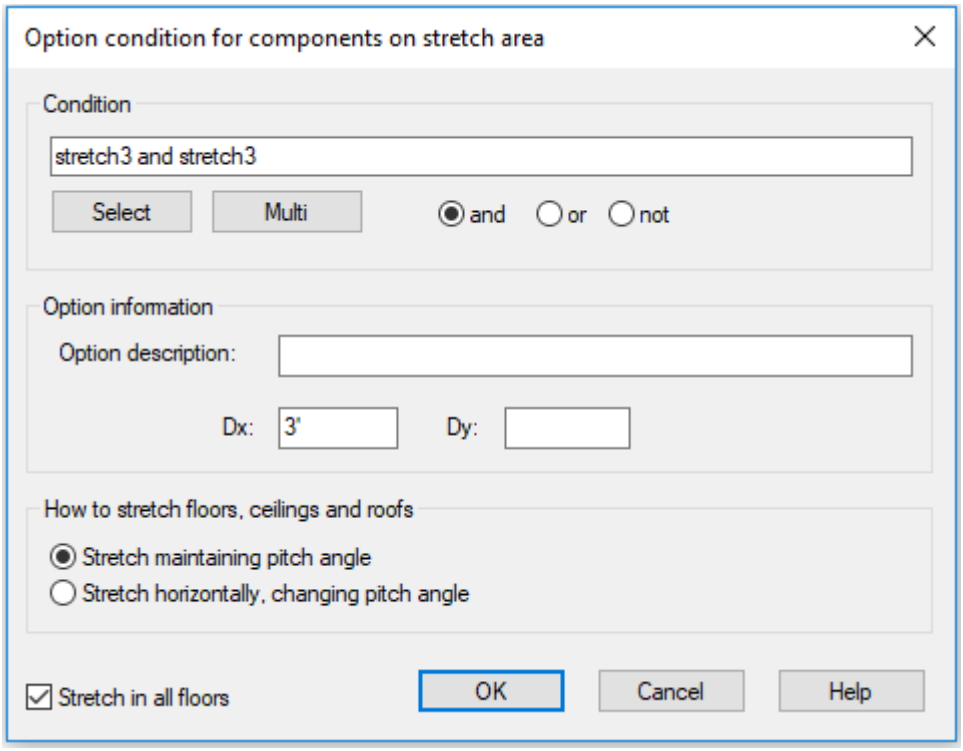
4 Click the **Select** button in the dialog box. The Project Options database view opens.

5 Add a line to the database and fill in the following information:



6 Click **OK** in the database view. The Option Condition for Components on Stretch Area opens again.

7 Enter the stretching dimension in the dialog box. In this example, you will stretch the building in the x axis direction. Enter the dimension in the **Dx** field. To apply the change to all drawing-model pairs of the building, select the check box **Stretch in all floors**. If the area to be stretched includes sloping horizontal structures, you can select whether the structure is stretched in the horizontal direction or in the sloping direction. In this example, the stretching direction is insignificant, and you can use either of the options.



8 Click **OK** in the dialog box. The building will be stretched when you solve the option, see "Solving the Whole Building" on page 59.

Note: The stretch option will not be processed when you use the **Test Options** function, see "Activating All Options With the Same Name" on page 40.

Reversing a Building

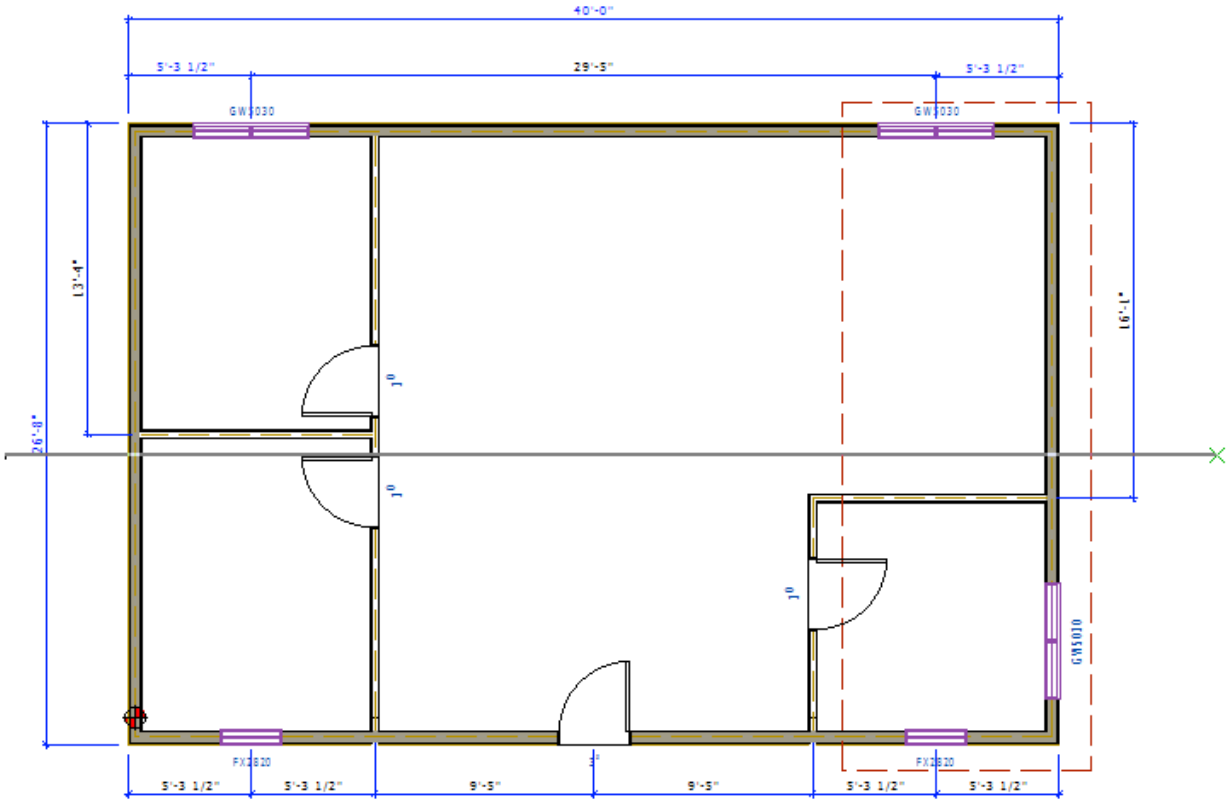
Using the options function, you can reverse the whole building. The building is mirrored about a user defined axis. All components, including wall panels, are mirrored.

Defining the Mirroring Line

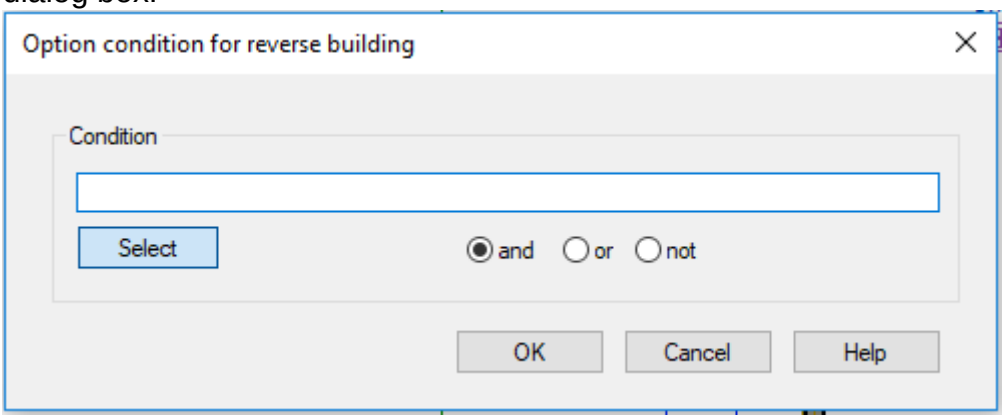
Define two points by which the building model will be mirrored.

1 In the Options tab, select **Mirror Line >**  **Define**

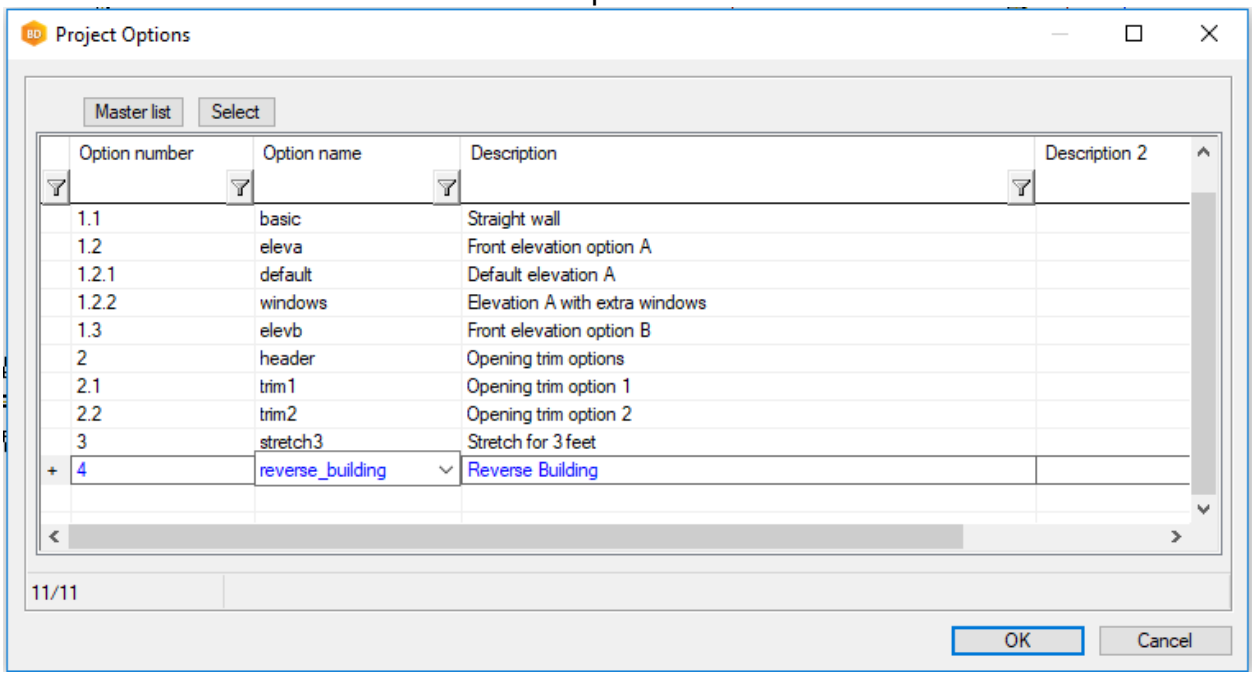
2 Select the start and end points of the mirroring line.



3 The Option Condition for Reverse Building opens. Click the **Select** button in the dialog box.



4 Add a line to the database and fill in the option data.



Note: Select **reverse_building** from the **ID** list.

5 Click **OK** in the database view and the Option Condition dialog box. The building will be mirrored when you solve the option, see "Solving the Whole Building" on page 59.

6 Hide and show the location of reversal axis with the **Mirror Line > Toggle** function.

Note: The **reverse_building** option will not be processed when you use the **Test Options** function, see "Activating All Options With the Same Name" on page 40.

4 Solving Options

Once you have defined and designed all options, you can create different design alternatives of the building by solving the options. You can create a job specific drawing set for each solved building. You can also create a construction document set to indicate all of the options available for the particular project.

Solving the Whole Building

In the previous chapter you learned how to check the options by activating all options with the same name, see "Activating All Options With the Same Name" on page 40. Once all options work correctly you can solve for the entire building.

When you solve the whole building the system will store and deactivate the original model and drawing files of the project. After solving the options, you can restore the option model and create and solve additional options.

Note: It is always a good idea to save your project prior to solving the entire building.

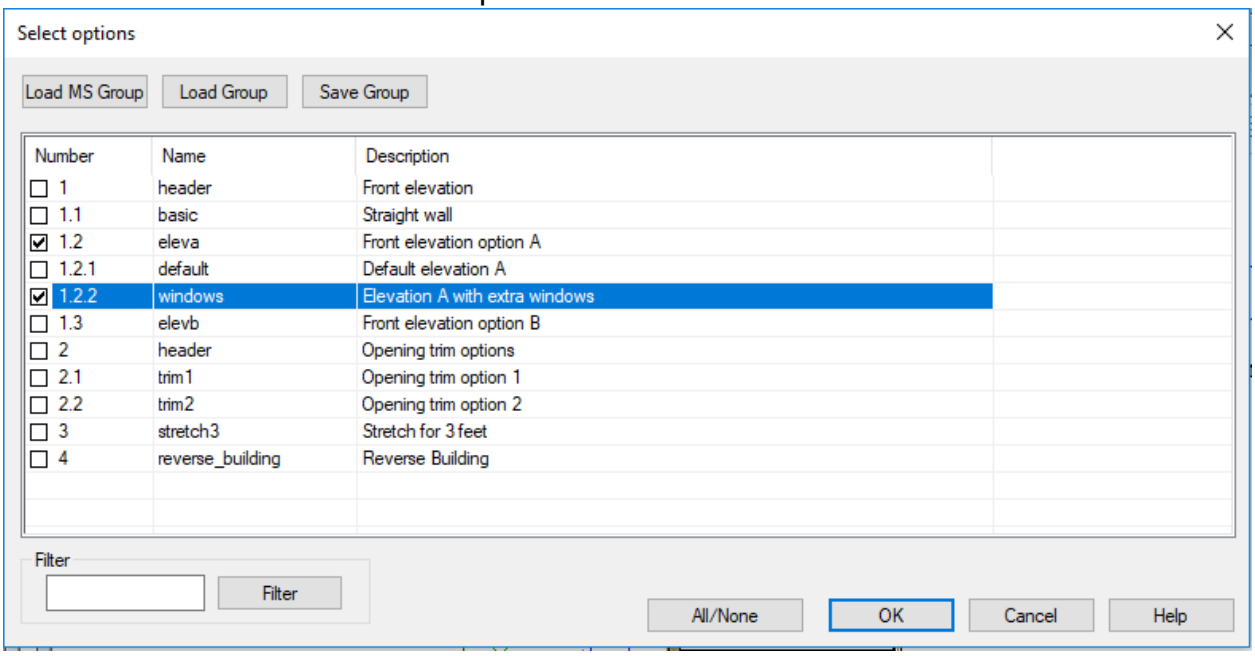
To solve the whole building, follow these steps:

1 In the Options tab, select **Solve >**  **Solve**. The Select Options list opens.

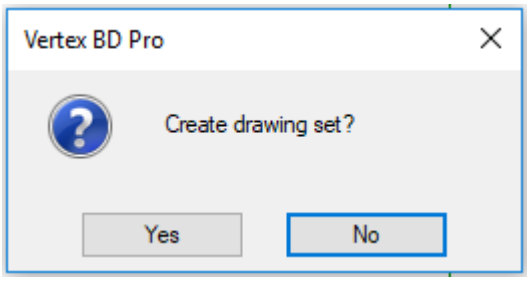
2 For the example project, select the following options:

- 1.2 Front Elevation option A
- 1.2.2 Elevation A with extra windows

Select the check boxes of these options on the list.



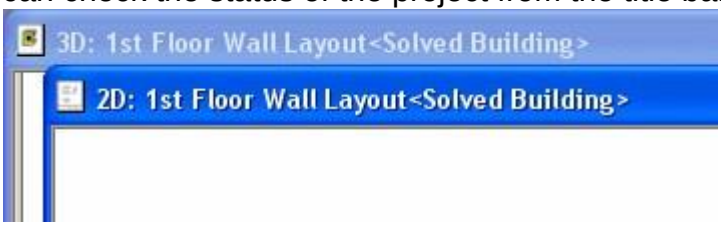
3 Click **OK** to confirm. You will receive the prompt:



When you solve the whole building, you can create the job specific floor plan, elevation, section etc. drawings of the solved building. The drawing sheets to be generated are the same drawing sheets you can create and refresh with the **Drawing Sheets** function in the Output tab.

4 Click **Yes** to create the job specific drawing set.

The program solves the options and refreshes the model and drawing files of the building. Once the process is complete, the system remains in the solved model. You can check the status of the project from the title bar of the working window.



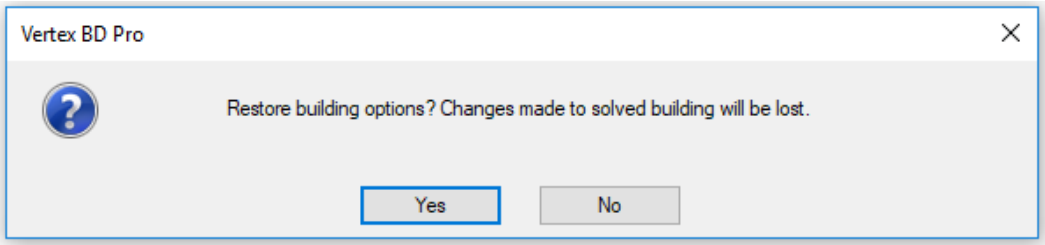
You can open the drawing sheets with the **Drawing Sheets** function.

Note: You can also optionalize the drawing sheets for different options, see "Optionalizing Drawing Sheets" on page 62.

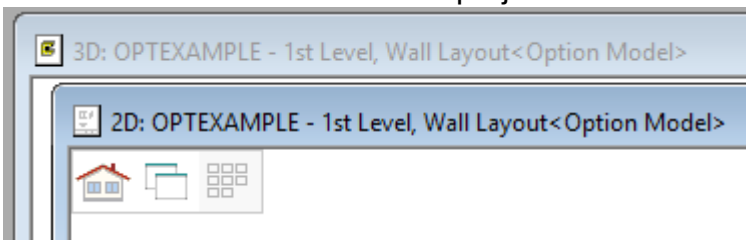
Restoring Option Model

When you solve the whole building the system deactivates the original model and drawing files of the project. You can restore the option model with the Restore Option Model function. After you have restored the option model, you can no longer view the drawing sheets of the solved model.

1 In the Options tab, select **Restore** . You will receive the prompt:



2 Confirm the restoring of the model by clicking **Yes** in the appearing message box. You can check the status of the project from the title bar of the working window.



Optionalizing Drawing Sheets

You can edit the elevation views of the building by adding basic geometry elements like texts or lines to the drawing, for example. However, these elements are not connected to the building and won't be mirrored when you solve the **reverse_building** option. Therefore, you need to optionalize the elevation view drawings. In the next example, a ground level line is added to an elevation view drawing. The ground level line is optionalized for the **reverse_building** option by mirroring the line.

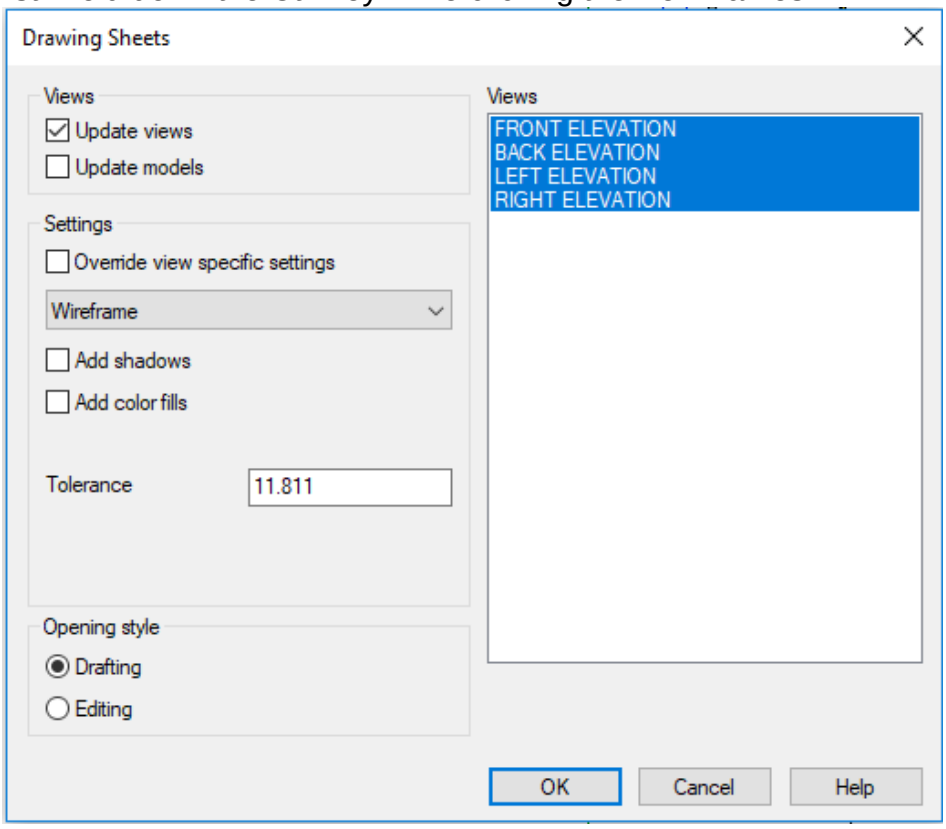
The template elevation views are usually empty drawings. Before adding the ground level line to the elevation views, the elevation view drawing files need to be updated according to the building model.

Updating the Elevation Views

Make sure you are in the Option Model status.You can check the status of the project from the title bar of the working window.

1 In the Output tab, select **Drawings > Update Views**. The View Tasks dialog box opens.

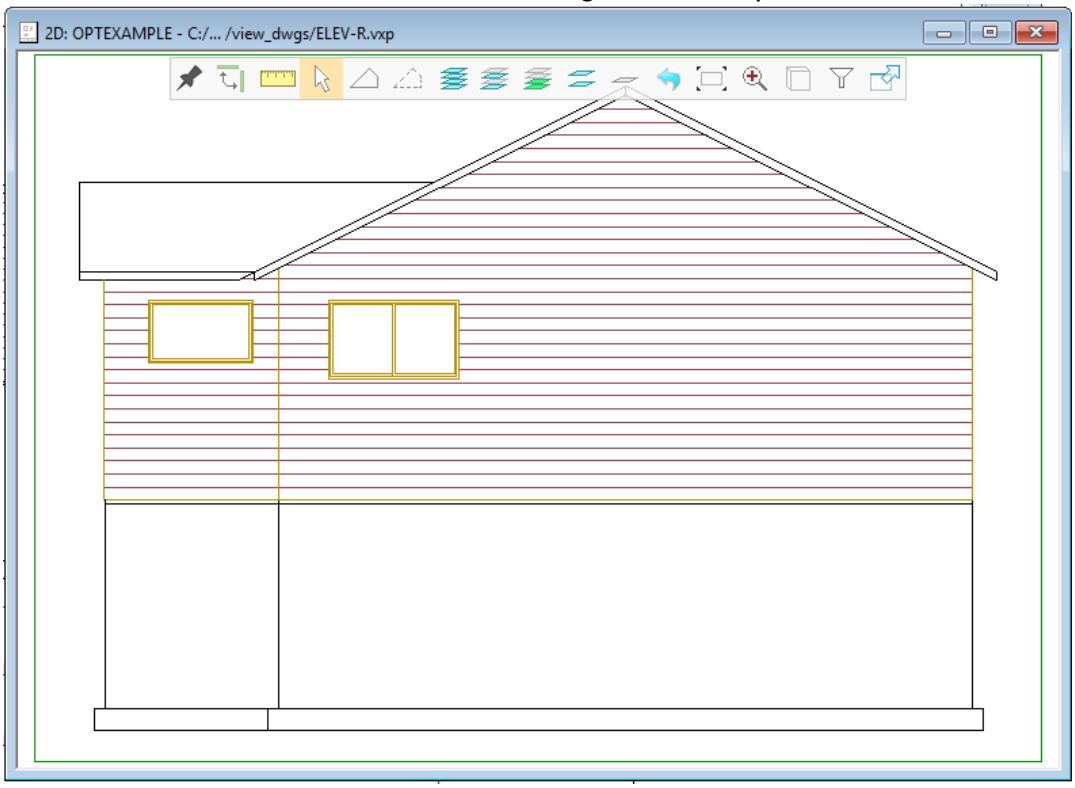
2 Select the check box **Update views**, and clear the check box **Update models**. The program will now use the drawing generation model created in the option solving process to generate the elevation views. Select all the elevation views in the **Views** list. Hold down the Ctrl key while clicking the view names.



3 Click **OK** in the View Tasks dialog box. The elevation view drawings open in separate drawing windows.

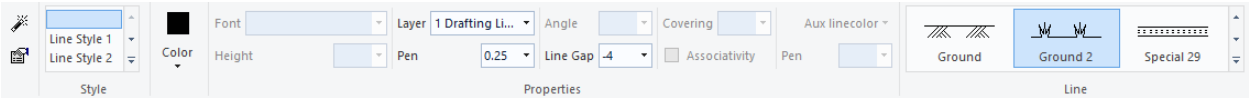
Adding the Ground Level Line

1 Activate one of the elevation view drawings, for example the ELEV-R.



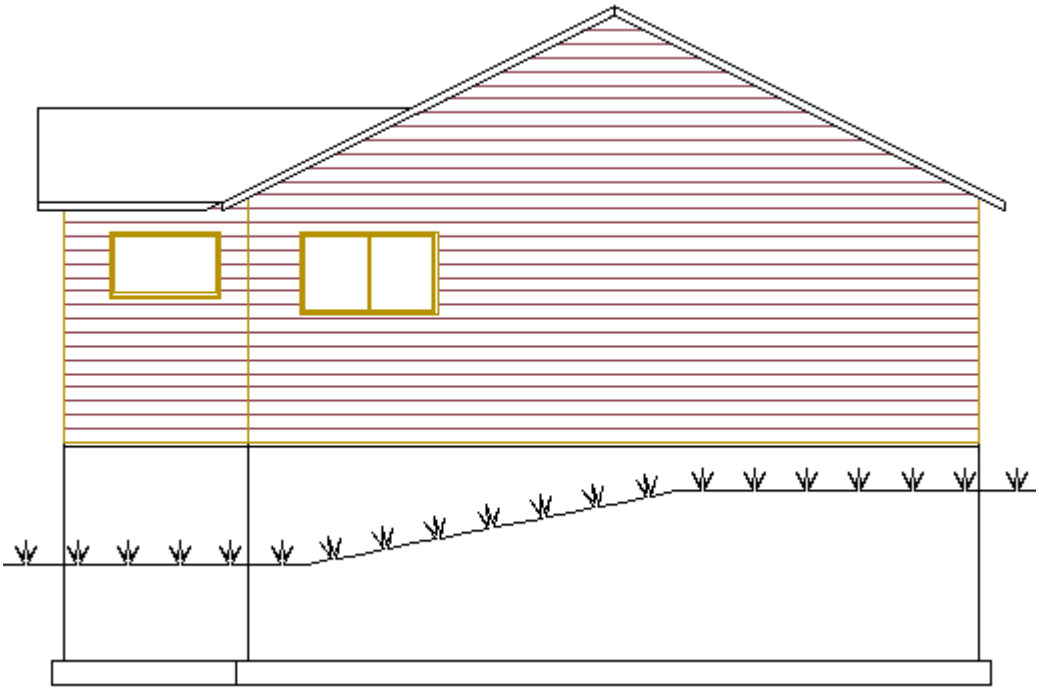
2 In the Drafting tab, select **Lines >** **Polyline**.

3 Select the properties of the line from the drop-down lists on the contextual tool bar.



Note: If you want to add a ground level line which cuts and either dashes or hides the lines of the foundation below the ground level, add the line on the layer 93 Dashing Ground Line or 94 Clipping Ground Line.

4 Add the line to the elevation view drawing.



5 Press Esc to quit the function.

Adding an option to the view drawing

First, create a geometry group of the ground level line, and add it to the option.

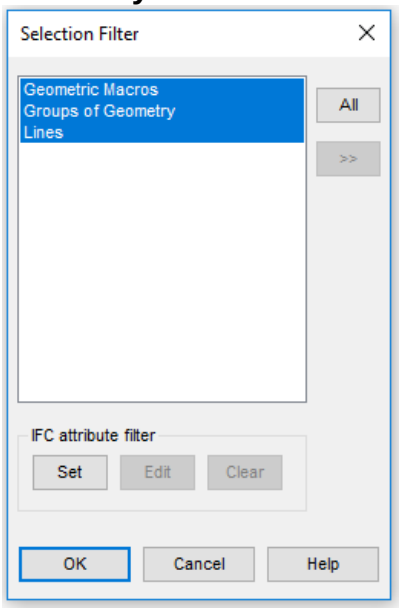
1 Select the line.

2 Right-click to open the context-sensitive menu.

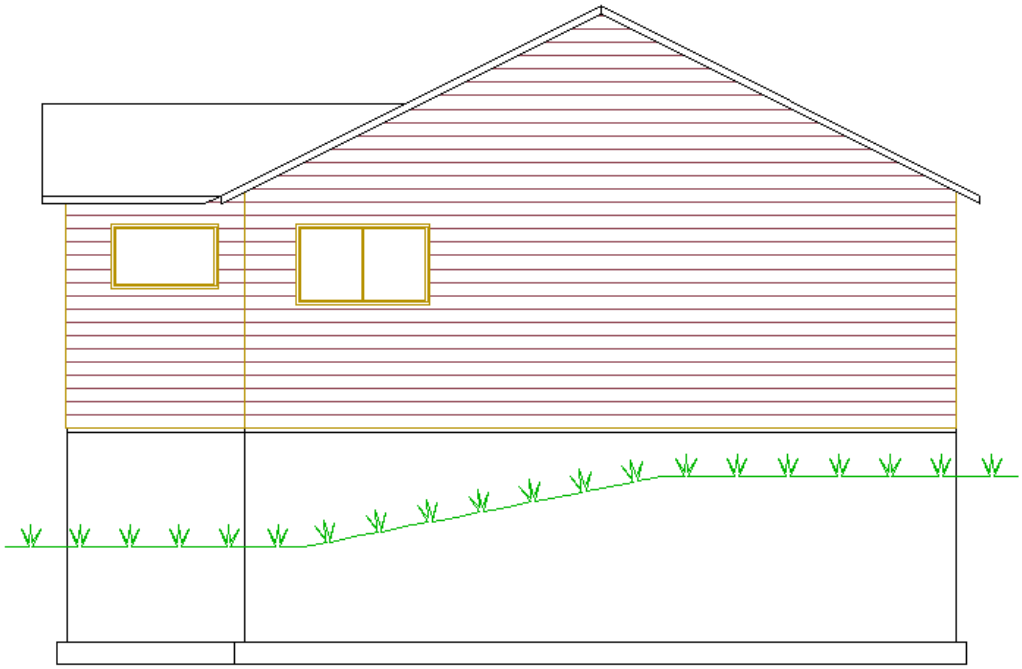
3 Select **Advanced> Create Group**.

4 In the Options tab, select **New**.

5 Click the **Selection Filter**, and make sure that the element type **Groups of Geometry** is selected.

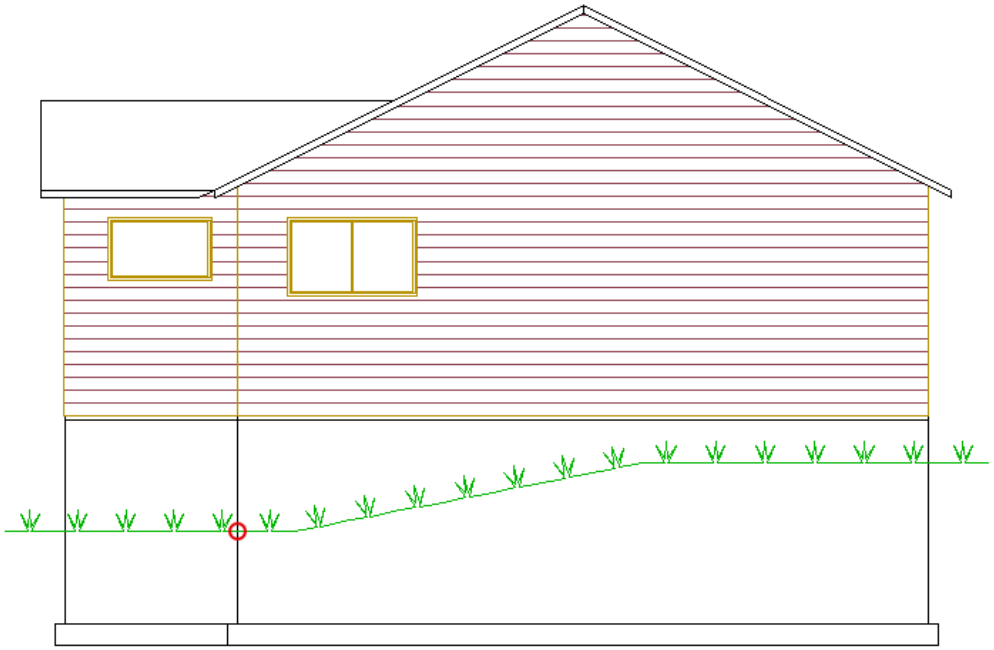


6 Select the geometry group consisting of the ground level line.



7 Select the **Confirm** function.

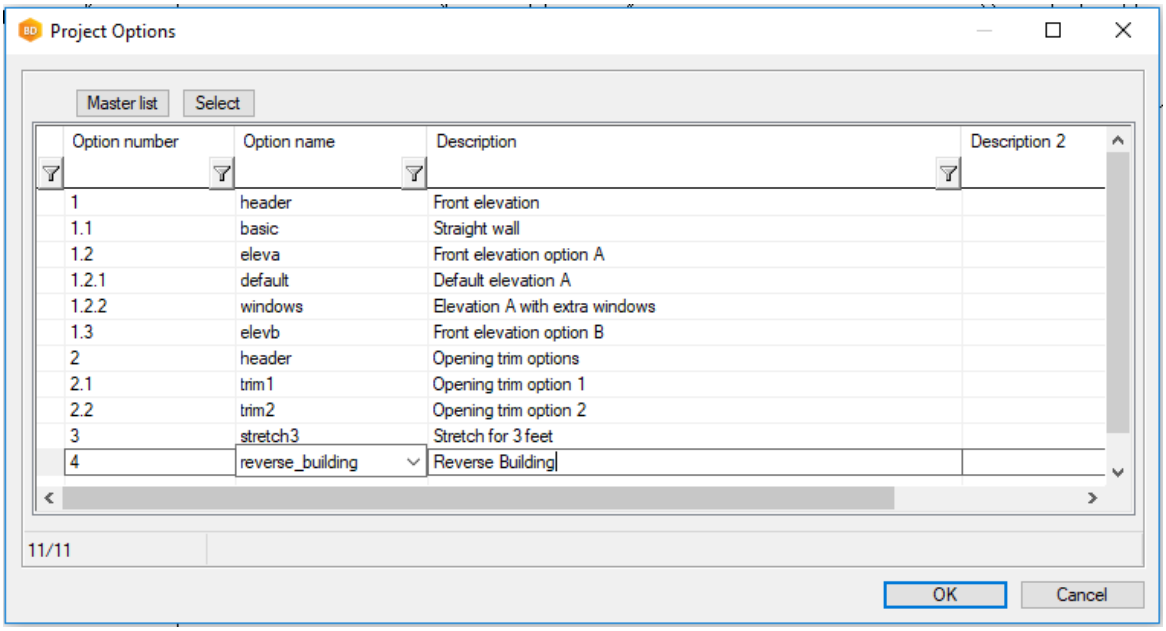
8 Select the locating point. Select a point in the drawing. In the next figure, the intersection point of the foundation wall and the ground level line is selected.



The Option Condition for Components in Option Box dialog box opens.

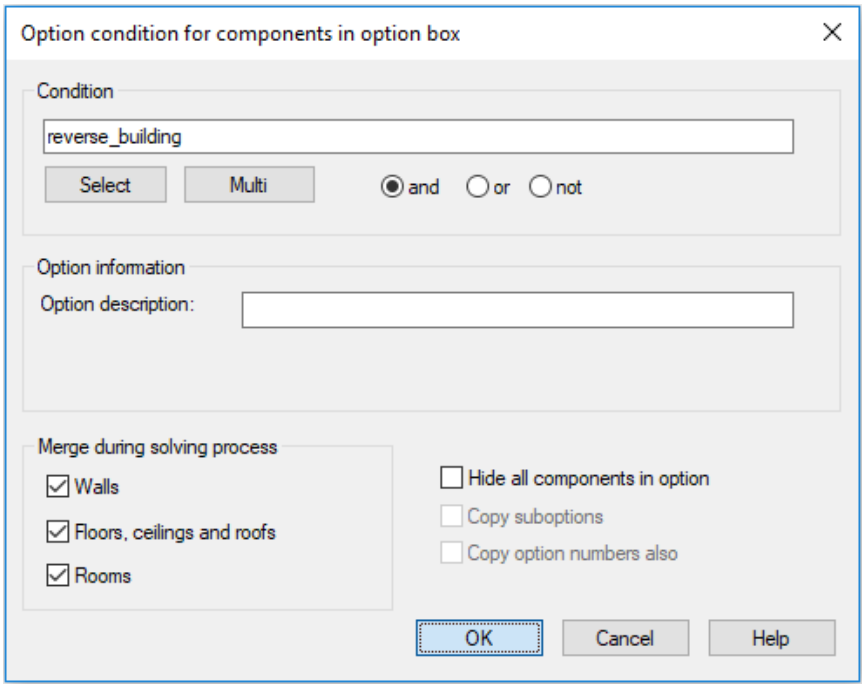
9 Click the **Select** button in the dialog box. The Project Options database view opens.

10 Move the cursor on the line **4 reverse_building** and click **OK**.

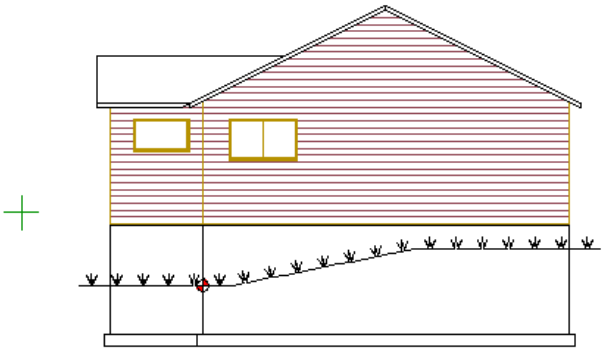


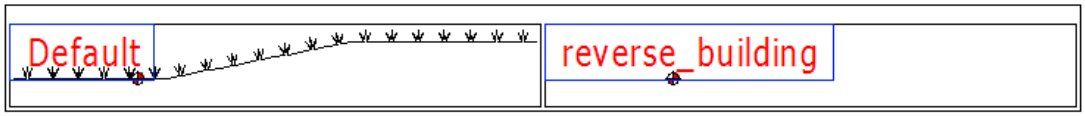
The Option Condition for Components in Option Box dialog box opens again.

11 Click **OK** to confirm.



12 Select the location for the option box. If necessary, edit the option box size and location, see "Editing the Option Box Size" on page 26.



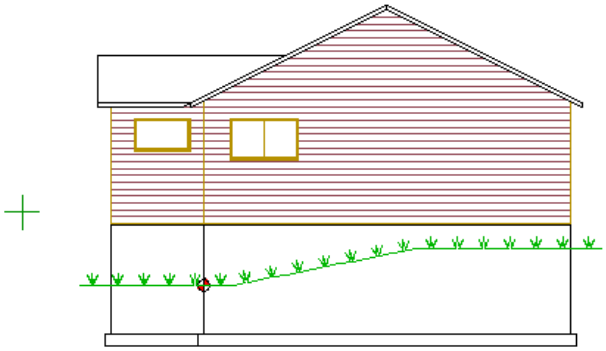


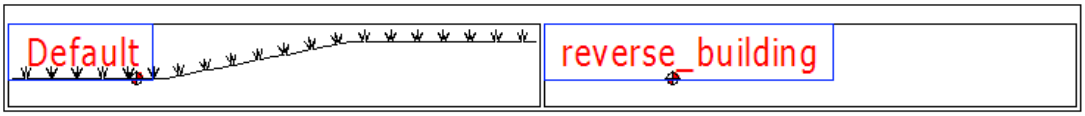
Editing the Option

Edit the option by mirroring the ground level line in the elevation view drawing.

1 Press Esc to quit the previous function.

2 Select the line.

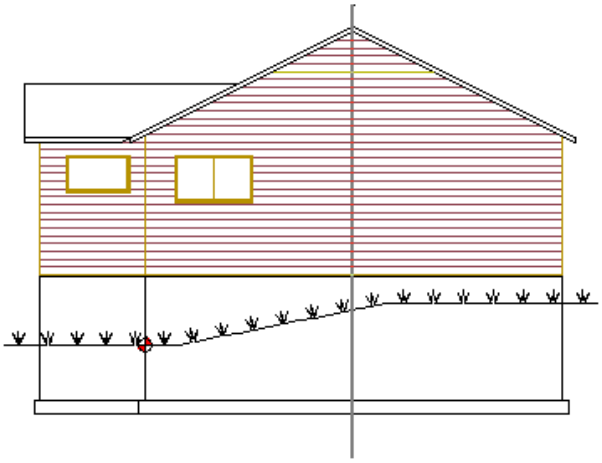




3 Right-click to open the context-sensitive menu.

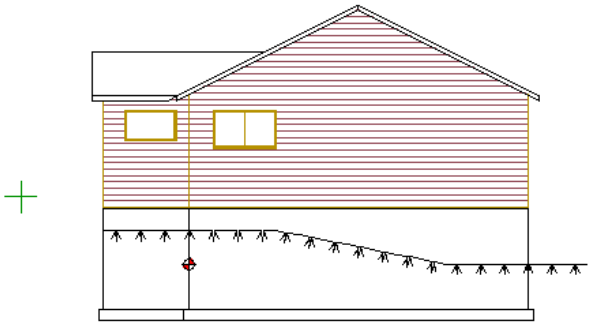
4 Select **Mirror** from the menu.

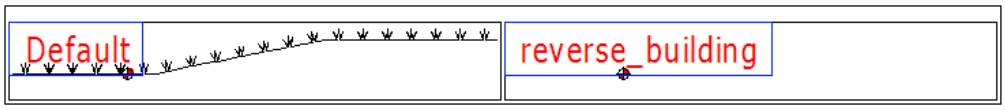
5 Select the start and end points of the mirroring line.



You will receive the prompt: "Maintain original geometry?"

6 Click **No** in the message box. The ground level line is mirrored.





7 Close the drawing file by clicking the **Close** button of the drawing window. You will receive the prompt: “Save changes?”

8 Click **Yes** in the message box.

Solving the Option and Viewing the Drawing Sheet

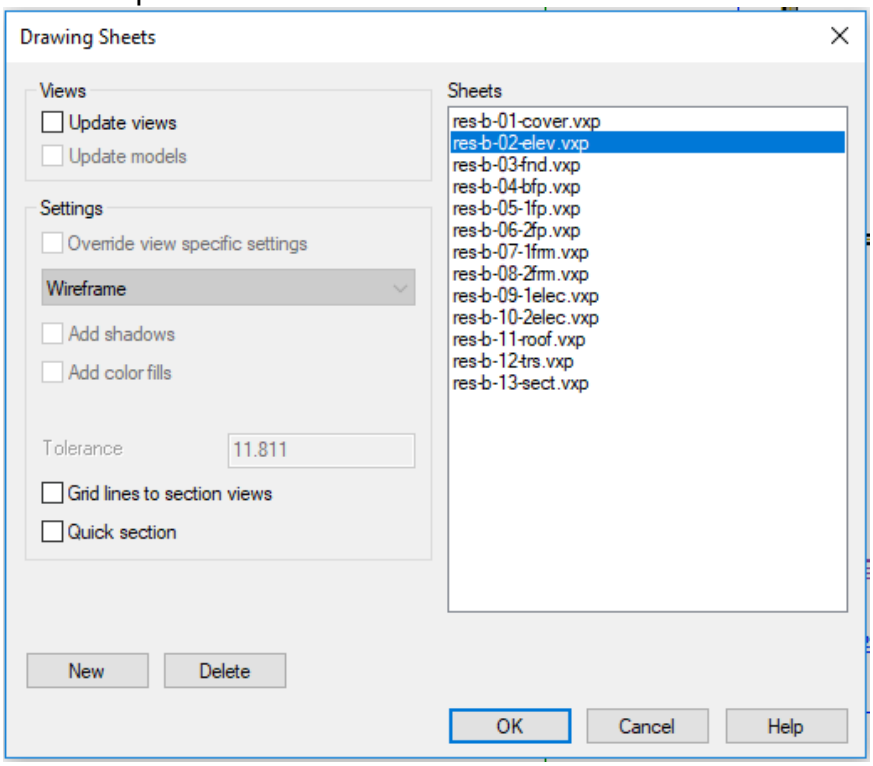
When you solve the options and select the **reverse_building** option, the ground level line in the elevation view drawing will also be mirrored.

1 Solve the options like described before, see "Solving the Whole Building" on page 59. Select the options **Front elevation option A** and **Reverse building** to be solved, for example. Select **Yes** when the program prompts you to create the job specific drawing set.

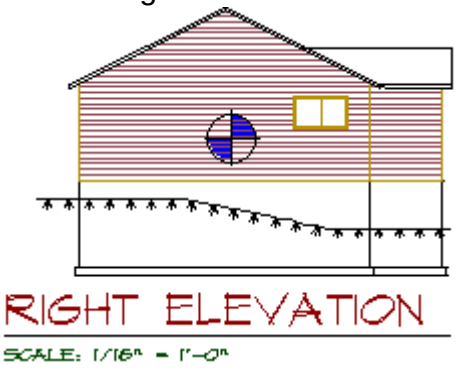
2 In the Output tab, select **Drawing Sheets**. The View Tasks dialog box opens.

3 Clear the check boxes **Update views** and **Update models**. These tasks were already performed when you solved the options and created the drawing set. Select

one of the elevation drawings sheets in the **Sheets** list, for example res-b-02elev.vxp.



4 Click **OK** in the dialog box. The elevation drawing sheet is opened and you can see the mirrored ground level line in the edited elevation view.



Creating a Master Set

In addition to the job specific document set, you can create a drawing set which will indicate all of the options and their combinations available for the particular project. This master set can be used to submit to a governing agency for approval, for example.

An option combination consists of option groups that you select for presolving before creating a master set. Each option group can contain several options. You can have an option combination presolved whenever you want, and then add the completed drawings to the master sets.

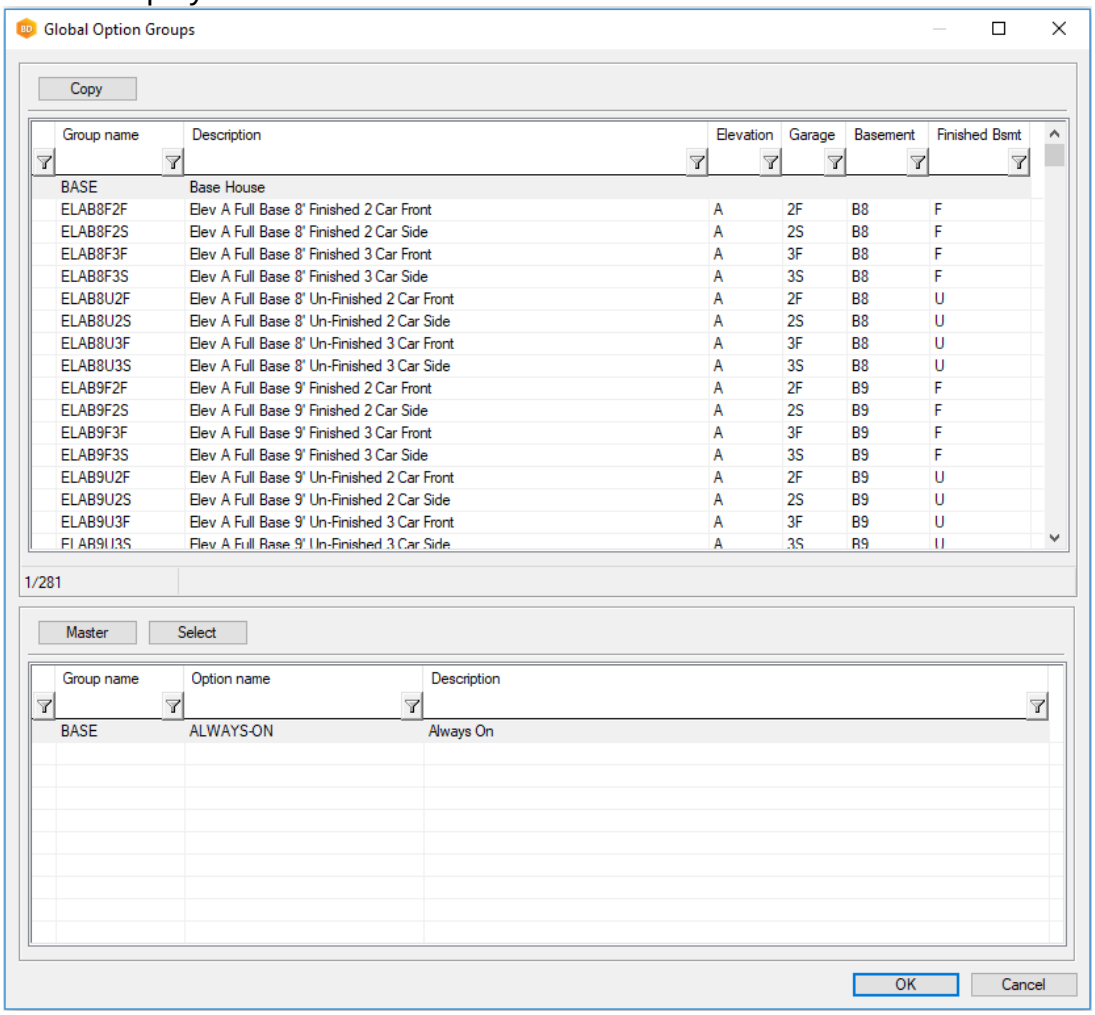
In the next example, you will create an elevation drawing with all the different front elevation alternatives of the example project placed on the same drawing sheet.

Note: Presolving options is available when the **Master Sets** add-on feature is included in your software.

Defining Option Groups

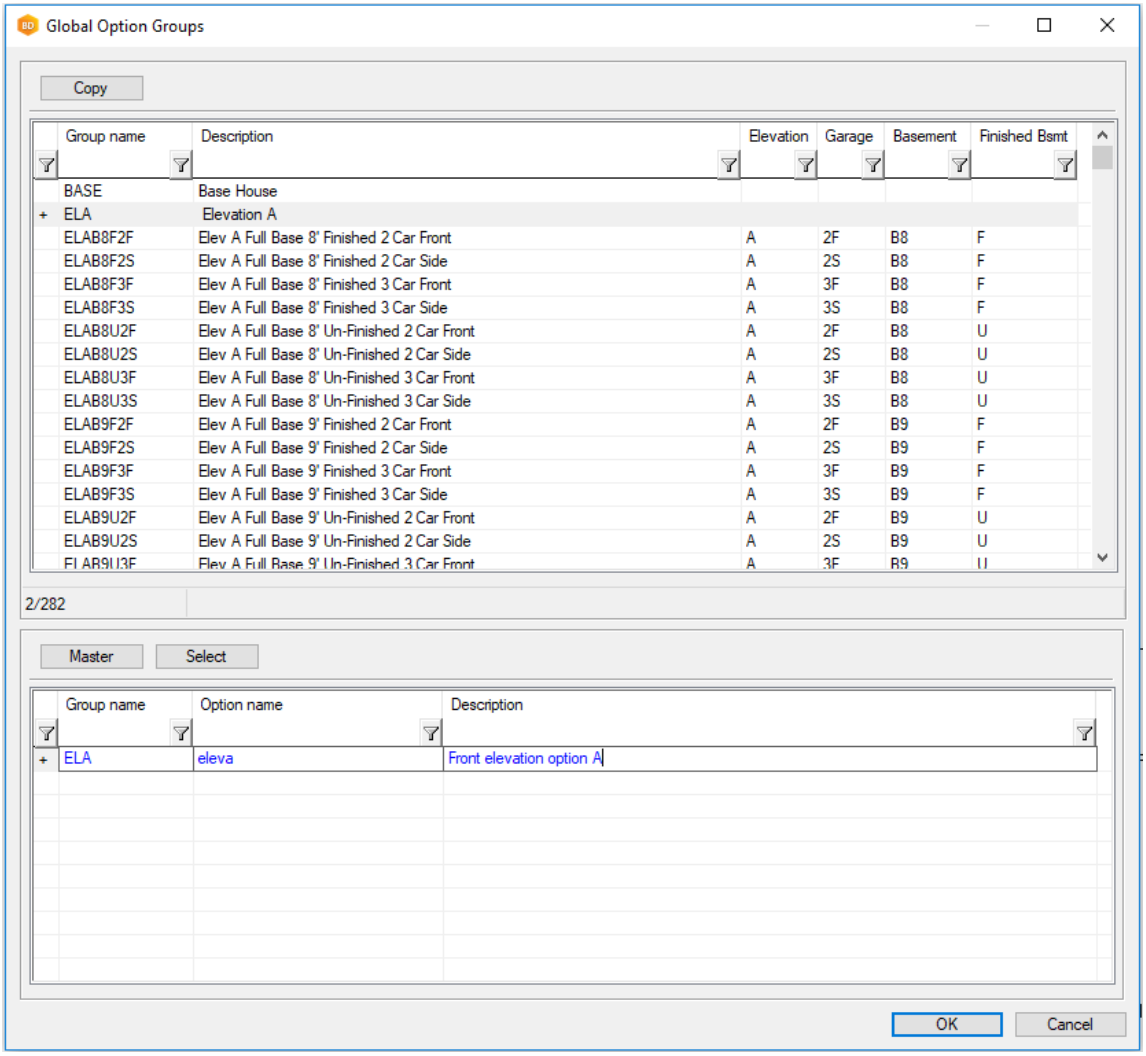
You can create an option group from individual options. When you select an option group to be solved, all the options in the group will be solved. You can use the global option groups in all projects. The basic delivery of the software includes an example of an option group database. The database can be customized to meet the requirements of your company. In this example, you will create an option group for the different elevation alternatives.

1 In the Options tab, select **Project Options >** **Global Option Groups**. The Global Option Groups database view opens, and the Options of Group database view is displayed below it.



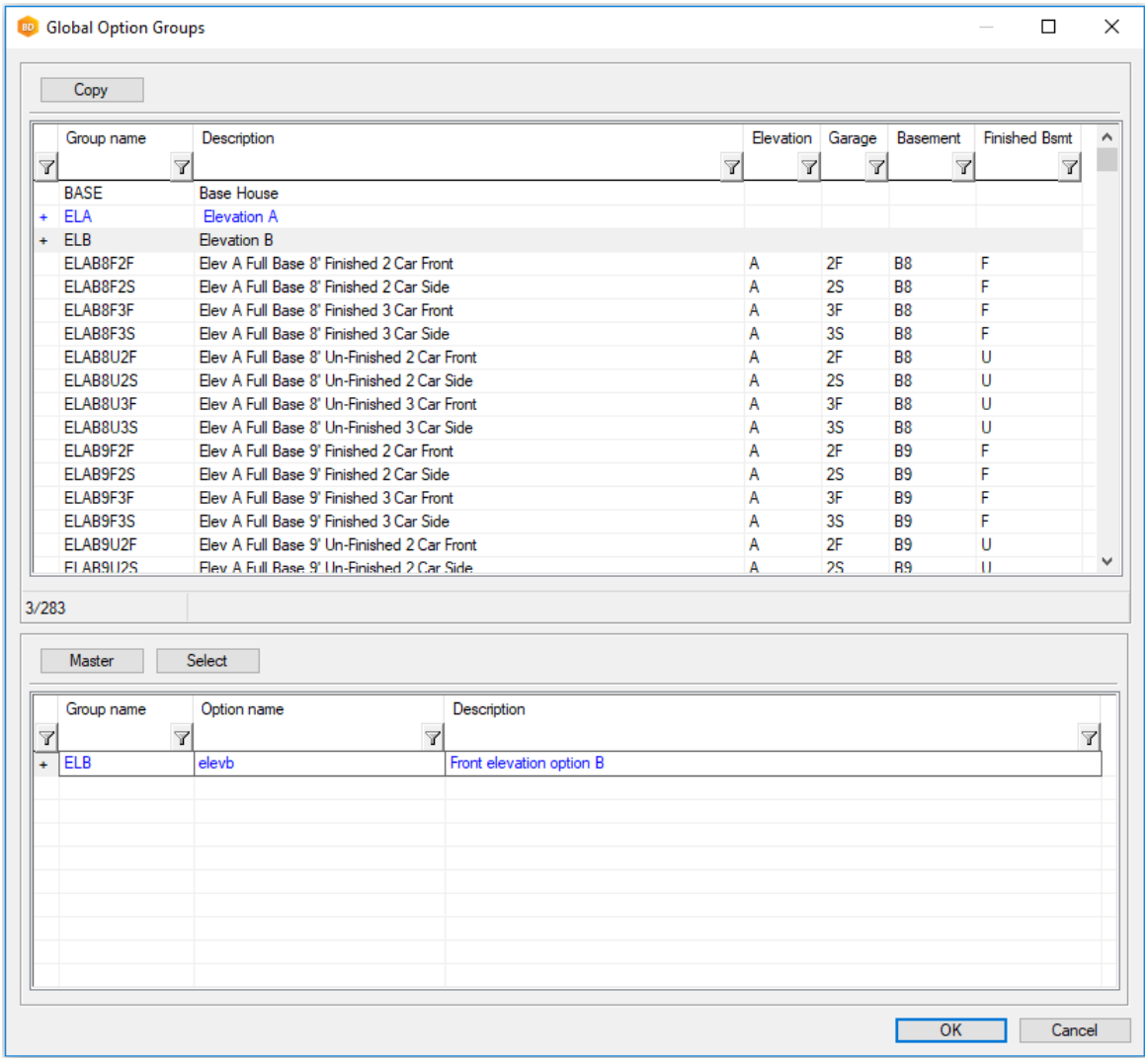
The option group database should always include the **BASE** option group, which is the base model of the building.

2 Add a line to the Global Option Groups database, and fill in the data of **ELA** group as shown in the next figure.



An option group can include several options, but in this example, just one option is defined for the **ELA** option group.

3 Define another option group **ELB** in the same way.



4 Close the database views by clicking **OK**.

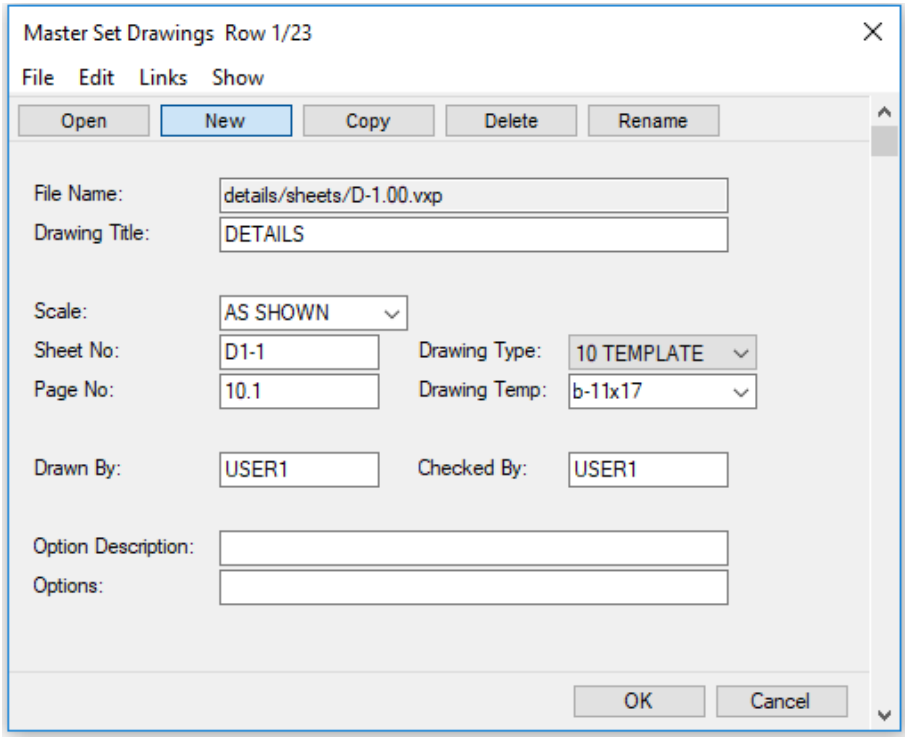
Note: You can select an option from the Master database by clicking the **Master** (select one option) or **Select** (select several options at once) button in the Options of Group database view.

Creating a New Drawing Sheet

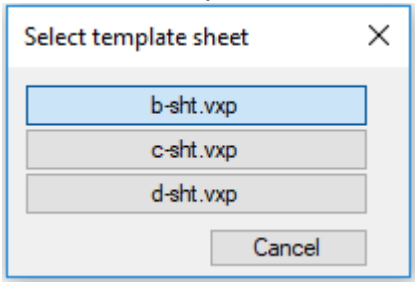
Create a drawing sheet for the different elevation alternatives.

1 In the Options tab, select **Master Set**. The Master Set Drawings database view opens.

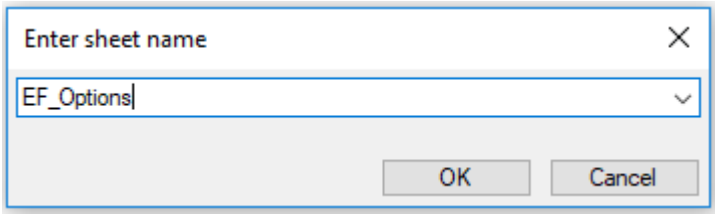
2 Click the **New** button in the database view.



3 Select the template sheet. Select the B size sheet b-sht.vxp, for example.

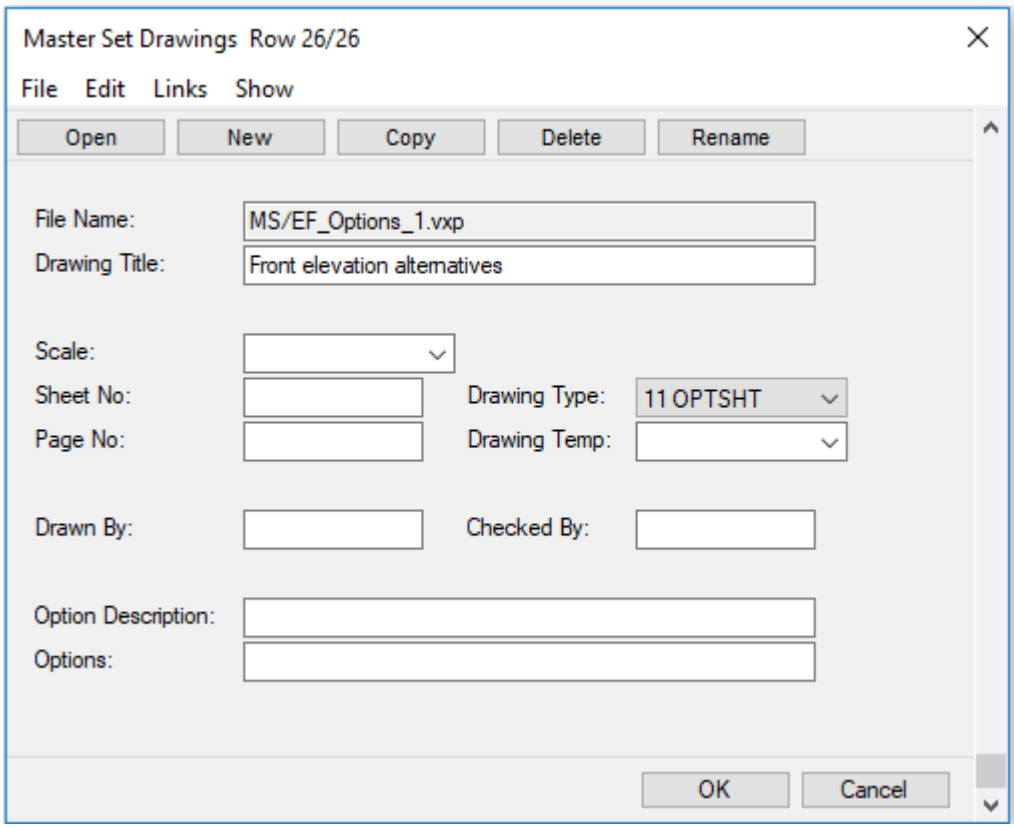


4 Type the sheet name in the text box.



Note: Type the name without the extension .vxp. The program will automatically name the drawing sheet as EF_Options_1.vxp.

5 Fill in the other information about the drawing.



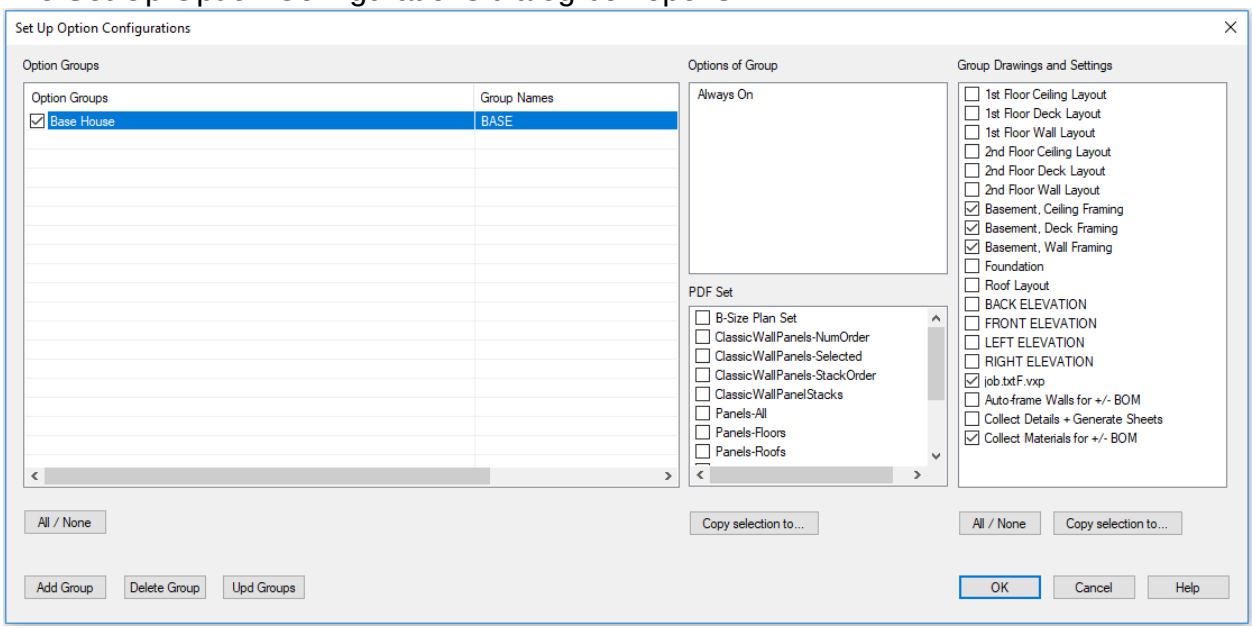
6 Click **OK** in the database view.

The database view is closed and the drawing sheet EF_Options_1.vxp remains open in the work space.

Setting Up Option Configurations

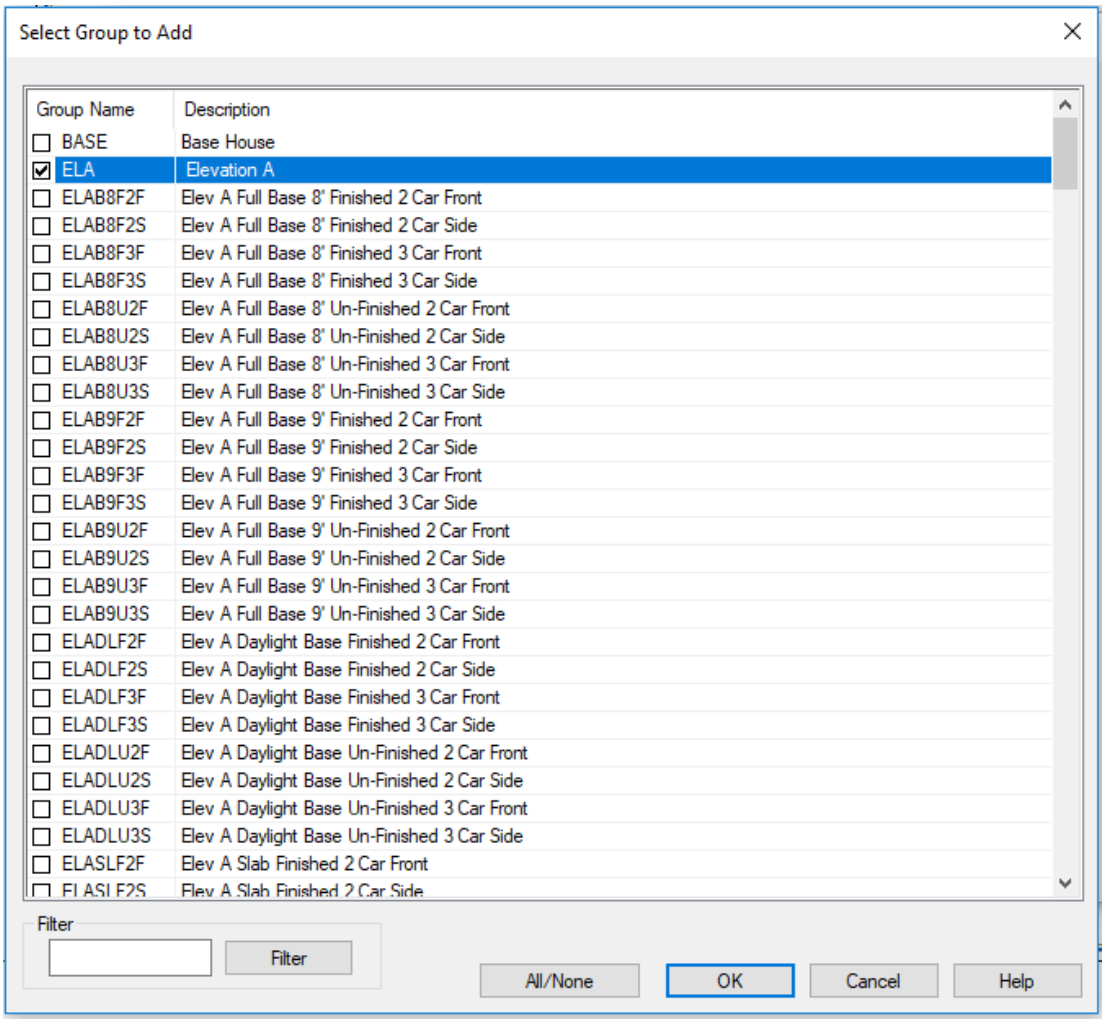
Define the option groups to be solved and the drawings to be created from them.

1 In the Options tab, select **Master Set >** **Set Up Option Configurations**. The Set Up Option Configurations dialog box opens.



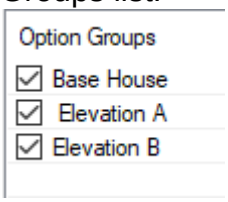
2 Click the **Add Group** button in the dialog box. The Select Group to Add selection list opens.

3 Select the option groups **ELA** and **ELB** you defined earlier from the list. Scroll down the list, if necessary.

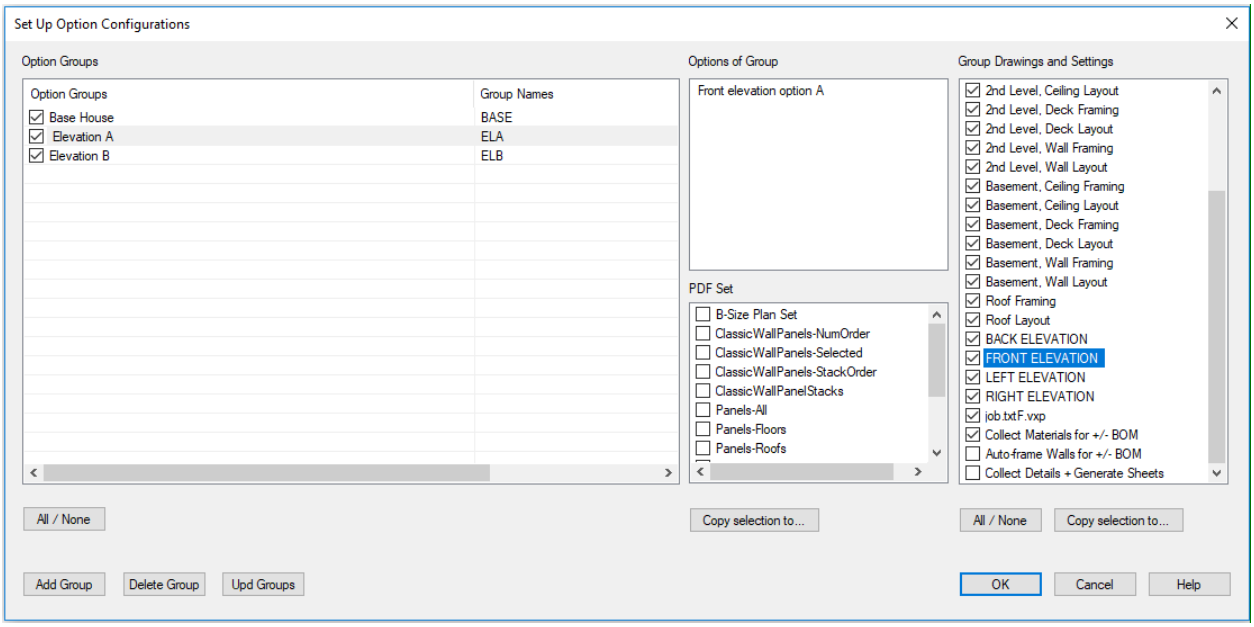


4 Click **OK** to return to the Set Up Option Configurations dialog box.

5 Select all the option groups to be solved by selecting the check boxes in the Option Groups list.



6 For each option group, select the drawings that will be created when the options are solved. Select the drawings in the Group Drawings and Settings list. In this example, select at least the **FRONT ELEVATION** for each group.

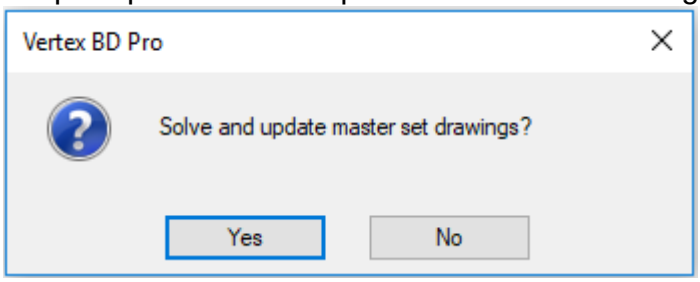


7 Click **OK** to save the settings and close the dialog box.

Solving the Options

After selecting the option groups to be solved and the drawings to be created from them, you can start solving an option configuration. If the option configuration contains several option groups with several options to be solved, solving them may take some time. You can leave the program to solve the option groups overnight, for example.

1 In the Options tab, select **Master Set > Solve and Update**. You will receive the prompt: Solve and update master set drawings?



2 Select **Yes** in the message box. The program solves the options and creates the selected drawings. The program creates a subfolder in the project's MS folder according to the name of the option group. The drawings will be saved in this folder. The solved model remains active.

Note: You can restore the option model by selecting **Restore** in the Options tab.

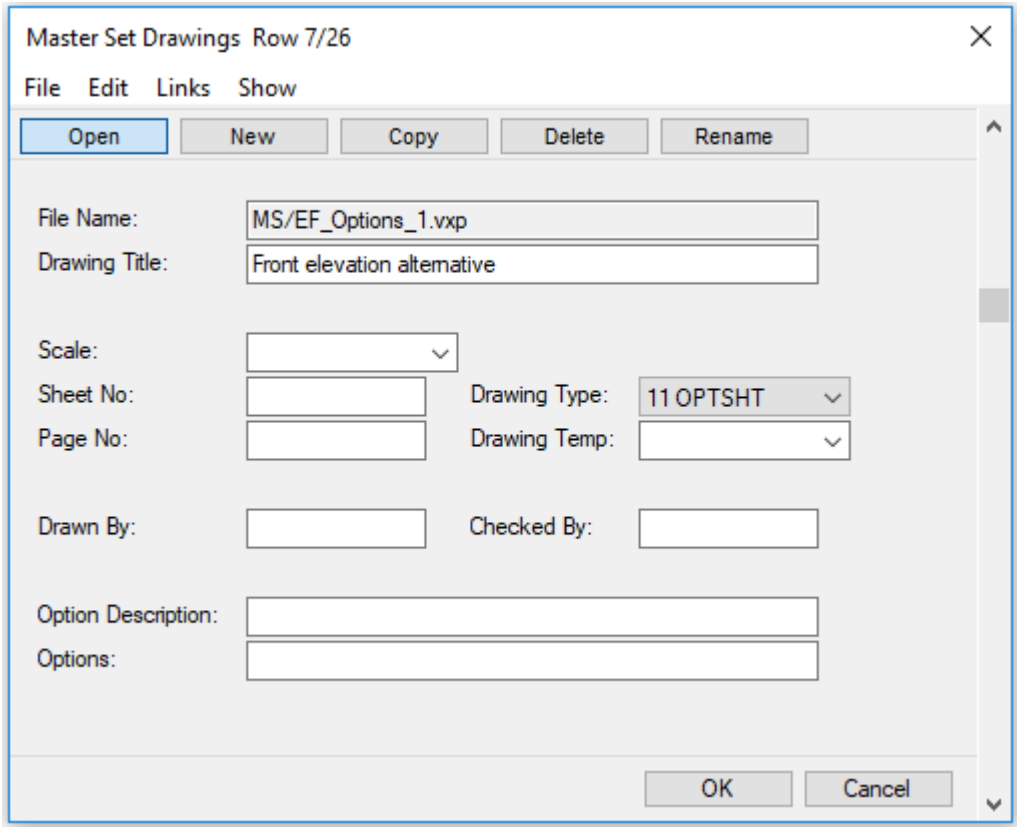
Opening a Drawing Sheet

Open the drawing sheet you created earlier.

1 In the Options tab, select **Master Set**. The Master Set Drawings database view opens.

2 If the drawing sheet you created is not on the first row of the database, use the cursor keys to move to the right row.

3 Click the **Open** button in the database view.



The drawing sheet opens in the work space.

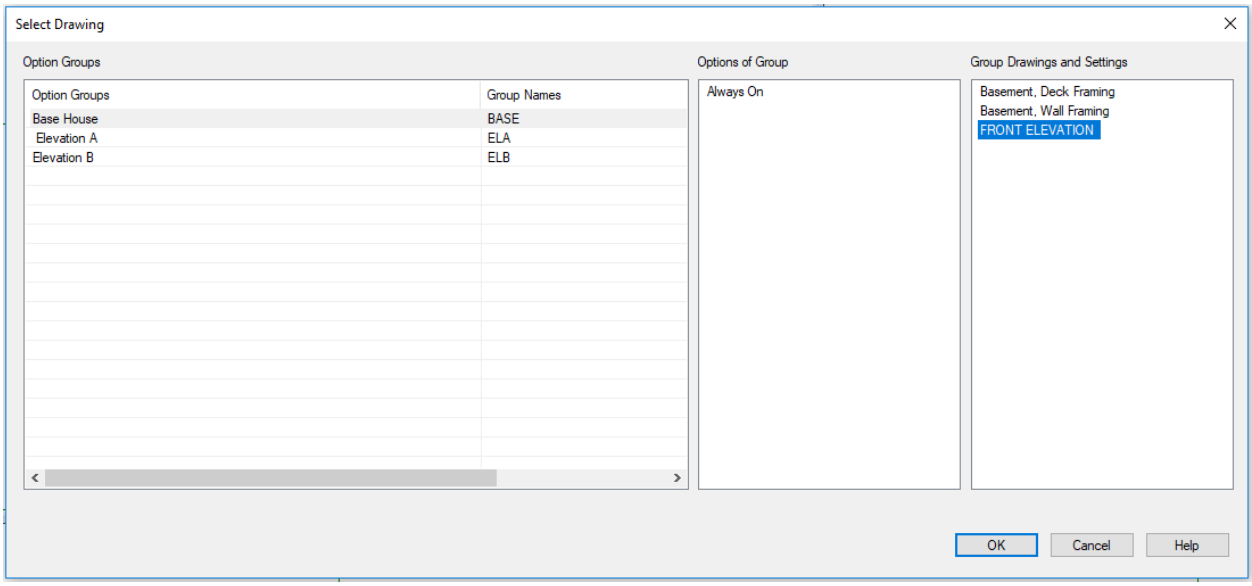
4 Click **OK** or **Cancel** to close the database view.

Adding an Optionalized Drawing on Sheet

After the option groups have been solved, you can add the drawings created from the solved model to master set drawing sheets.

1 In the Options tab, select **Master Set > Add Drawing on Sheet**. The Select Drawing dialog box opens.

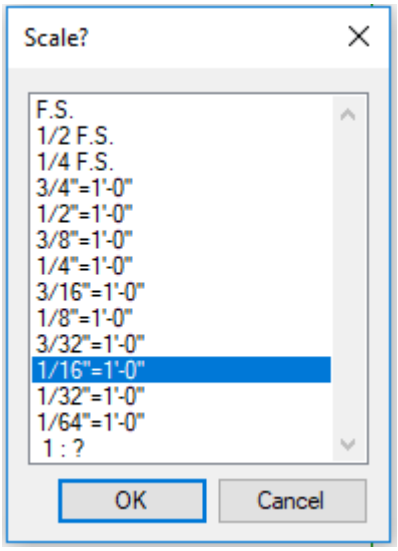
2 Select the option group **Base House** and the drawing **FRONT ELEVATION** in the dialog box.



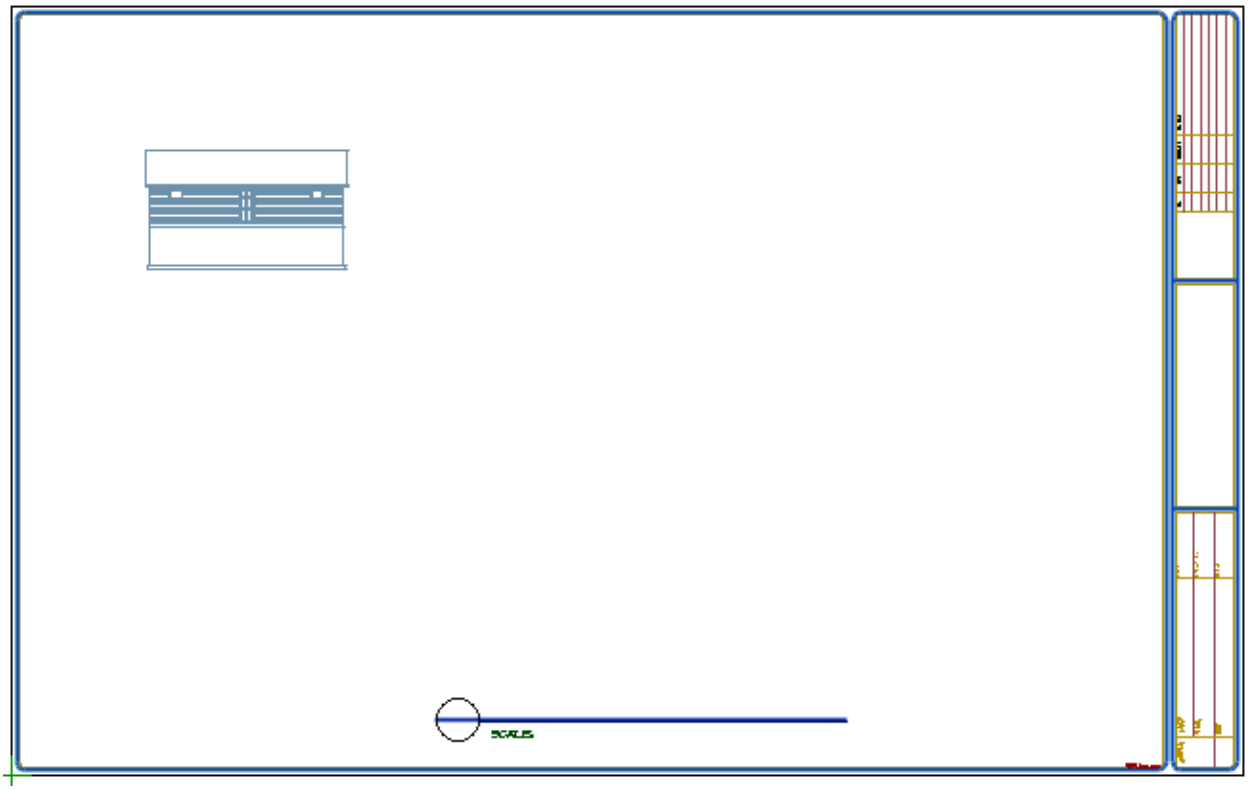
3 Click **OK** in the dialog box.

4 Before selecting the location of the view, change the scale of the view. Right click and select the 1:? **Scale** button.

5 Select the scale 1/16”, for example.

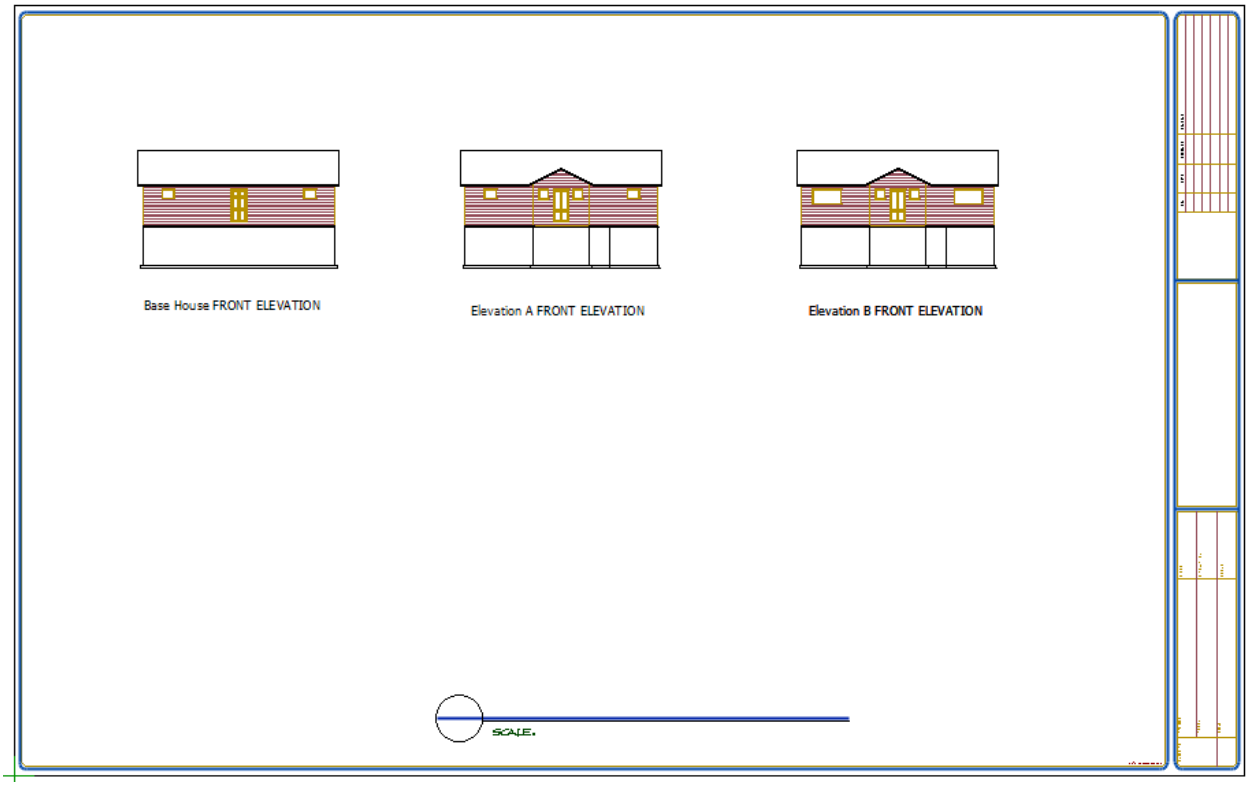


6 Select the location of the elevation view on the sheet.



The Select Drawing dialog box opens again.

7 Repeat the procedure for as many elevation alternatives you want to add to the drawing sheet. In the figure below, the front elevations of option groups Elevation A and Elevation B have been added to the drawing sheet in addition to the base elevation. You can also add other drawings to the sheet, for example the floor plan drawings of the different options.



8 After you have added all the desired views on the drawing sheet, click the **Cancel** button in the dialog box.

9 Select **File > Save** to save the drawing and close the drawing sheet by clicking the Close button of the drawing window.

Note: If you want to delete a view from the open drawing sheet, select **Reference Drawings > Delete** from the toolbar and select the view you wish to delete.

Comparing Bills of Materials

Once you have solved the entire building with the desired options, you can collect the materials and create the bill of materials in the usual way, i.e. using the functions in the **Material Reports** menu in the Output tab.

In addition to this, the Option System add-on feature includes the functionality to compare the material quantities between the default building and different sets of options. You can collect materials for each option group during presolving of options, and then select the option groups that you want to compare.

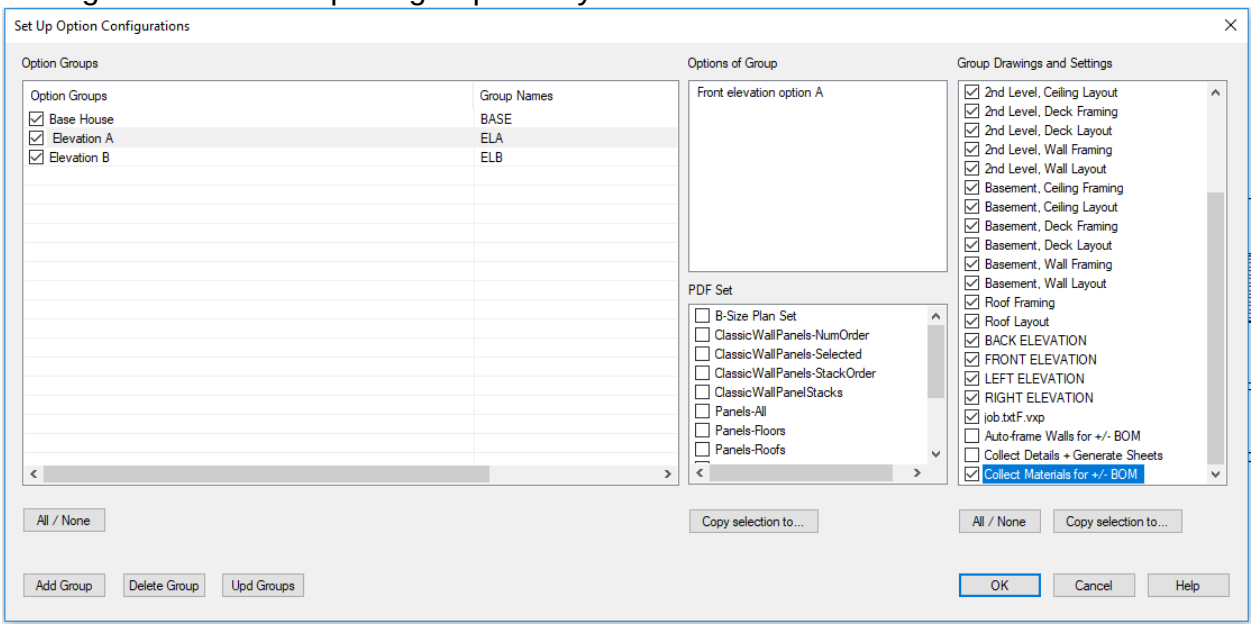
Note: Presolving options is available when the **Master Sets** add-on feature is included in your software.

Collecting Materials when Presolving Option Groups

You can collect materials for the differential bill of materials during option group solving. Collecting materials may increase the time required for solving.

1 In the Options tab, select **Master Set > Set Up Option Configurations**. The Set Up Option Configurations dialog box opens.

2 Select the **Collect Materials for +/-BOM** check box in the Group Drawings and Settings list for all the option groups that you want to collect materials from.



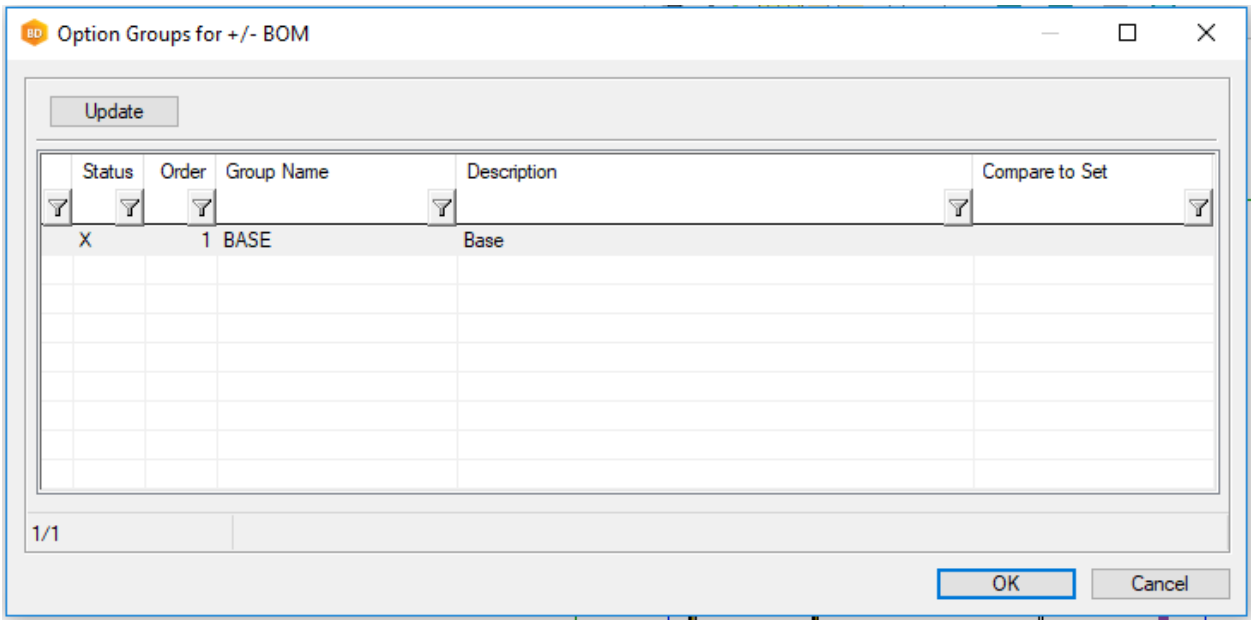
3 Click **OK** to save the settings and close the dialog box.

4 Solve the options with the **Master Set > Solve and Update** function, see "Solving the Options" on page 77.

Defining the Option Groups to be Compared

1 In the Options tab, select **+/-BOM Groups**.

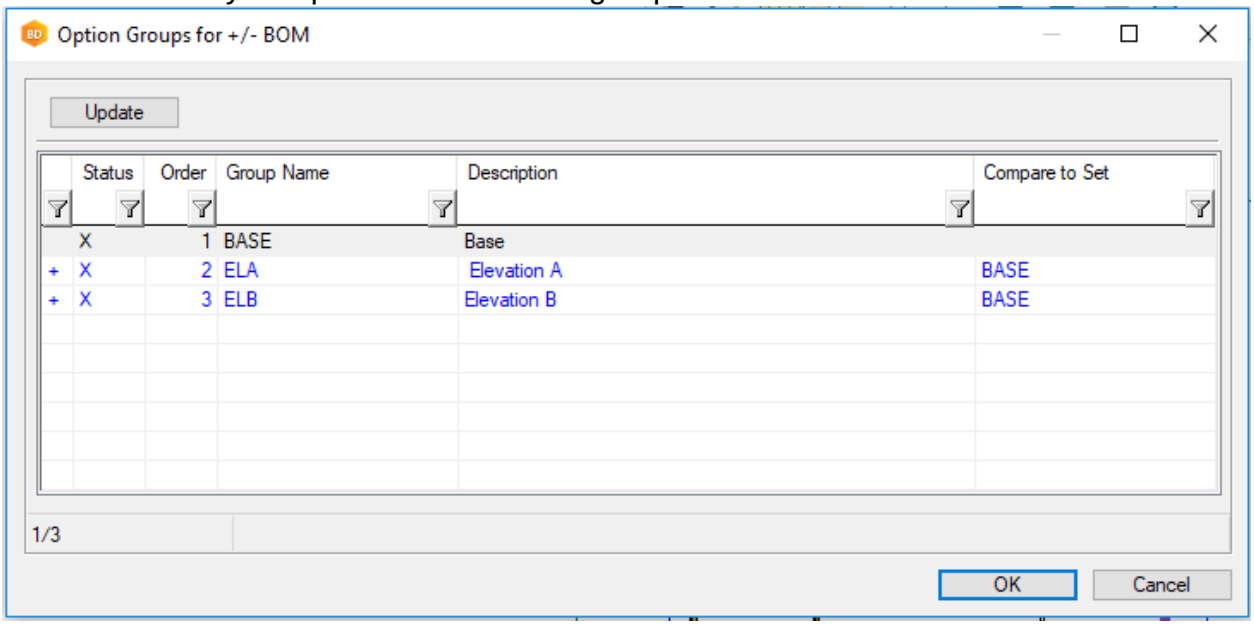
The Option Groups for +/-BOM database view opens. By default, the database contains the option group **BASE**. This is the default building model to which the material quantities of other option groups can be compared.



The items on the database view are:

- **Status** - The groups to be compared are marked with an X in the **Status** field.
- **Order** - The order number is used to sort and organize the list of option groups. Each group must have a unique number.
- **Group Name** - Label for the option group.
- **Description** - Description of the option group.
- **Compare to Set** - The **Group Name** of the option group you want the quantities to be compared to. Usually, the material quantities of option groups are compared to the **BASE** group.

2 Click the **Update** button to add the presolved option groups to the database. They are automatically compared to the **BASE** group.

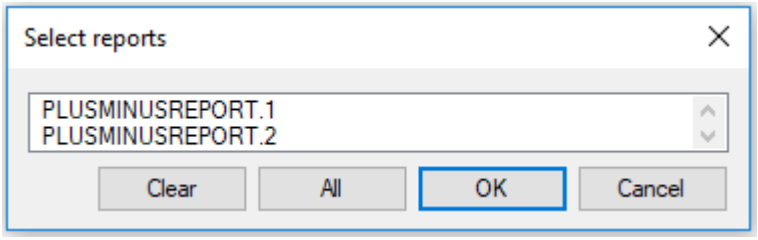


3 Click **OK** in the Option Groups for ±BOM database view.

Printing the +-/BOM Report

1 In the Options tab, select **Master Set >** **Print ± Reports**.

2 Select the report to be printed from a list.



The difference between these two reports is the output format of the bill of materials which is generated as a result of the comparison process. Both output formats can be customized to meet the requirements of your company.

The so-called Differential bill of materials is opened in the default word processor. The material quantities of the option groups are compared to the default building model named **BASE**. The materials of the **BASE** group are displayed at the top of the list. The quantities of the other model groups are compared to the **BASE** set, and only the differences in the quantities are displayed on the list on behalf of these sets.

You can edit, print and save the list with the functions of the word processor.