

Building Information Modelling

# Below Ground Revit Package Manual

(December 2017)

the easiest way  
to an 'accurate  
installation model' in BIM







# A Quick Guide to Wavin Revit content packages

## 1. Import packages following Wavin's instructions

- ⌚ Wavin Revit packages contain a lot of additional intelligence, a special Wavin validation view and pipe & fittings schedules.
- ⌚ Please import files as described by Wavin will give you all the benefits of the Revit packages.

See chapter 1.1 on how to correctly import the Wavin Packages

## 2. Insert pipes and fittings using the plumbing and piping panel and the properties window

- ⌚ Select the desired pipe type and diameter and then start drawing a pipework - appropriate default fittings will be inserted automatically.
- ⌚ By selecting the inserted default fitting, you can change it to another type by using a drop down list from the properties window.  
In some fittings, Wavin offers the possibility to modify their features via the "Graphics" or "Constraints" section of the "Properties" window.  
Via the "Pipe Fitting" or "Pipe Accessory" button in the "Systems" ribbon, you can manually insert desired fittings, which are not included in routing preferences.

Please read next chapters on a more detailed description on how to draw pipes and insert fittings. System-specific fittings are described in dedicated product range chapters.

## 3. Various pipe types available

- ⌚ Revit only offers plain-end pipes. Wavin however has made working with socket, and plain-end pipes possible.
- ⌚ Wavin supports working with OD pipe sizes, various colours and types.

See chapter 2.1 on a full overview of the pipe types you can select for your project.

## 4. Changing orientation and type of fittings

- ⌚ Wavin added checkboxes in "Properties" window to easily:
  - a. switch from an equal to an unequal Tee or from a straight 90° Tee to a swept Tee,
  - b. change the orientation of a fitting or rotate an eccentric reducer,
  - c. change many other features of the selected fitting.
- ⌚ Creating non-existent fittings will result in creation of custom fittings or an error message.

## 5. Implemented solutions for Tee

- ⌚ Intelligence allows inserting the Tee along with reducers, if needed.
- ⌚ If applicable, a proper sequence of reducers are inserted automatically. The user does not require full knowledge of catalogues.

See chapters 2.2 and 2.4 for a full overview of selecting the right Tee and reducers for your project.

## 6. Getting the newest package

Before starting a new project always make sure that you have downloaded the newest version of Wavin Revit Package for optimal functionality, and current product portfolio.

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# 1. Revit package - General information

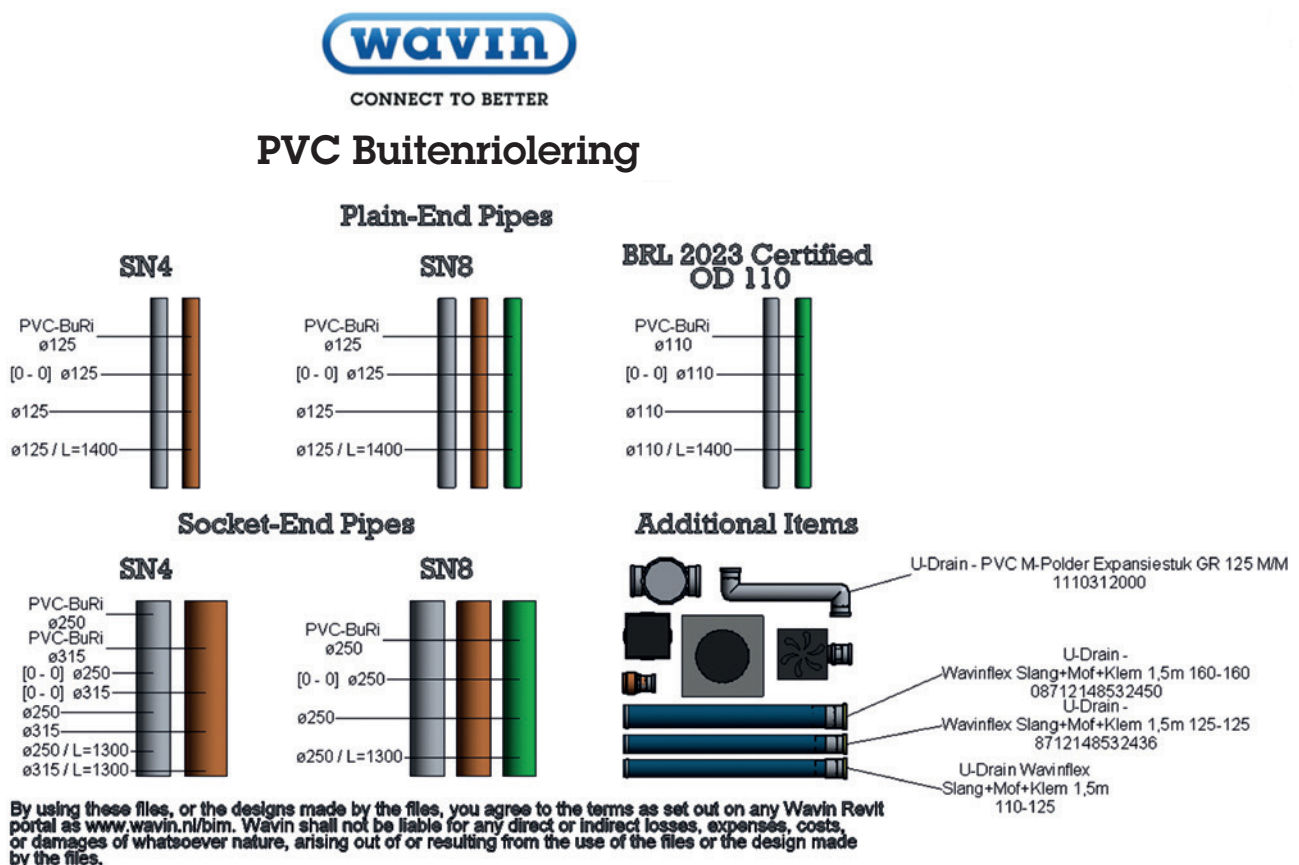
## 1.1. Importing Wavin Revit packages

In order to make designing with Revit more user-friendly, Wavin decided not only to create Revit families representing the products, but also to add an intelligence. This will help the user to make correct connections and transitions between pipes of different diameters. If correctly used, Wavin's Revit packages will grant user power not only to design the system, but also access to the data, names and catalogue codes of every part used in the system.

This additional functionality only becomes available if the Wavin Revit packages are imported correctly. Below are a few steps required to import the families with tags, Wavin Validation View, and specific Wavin schedules.

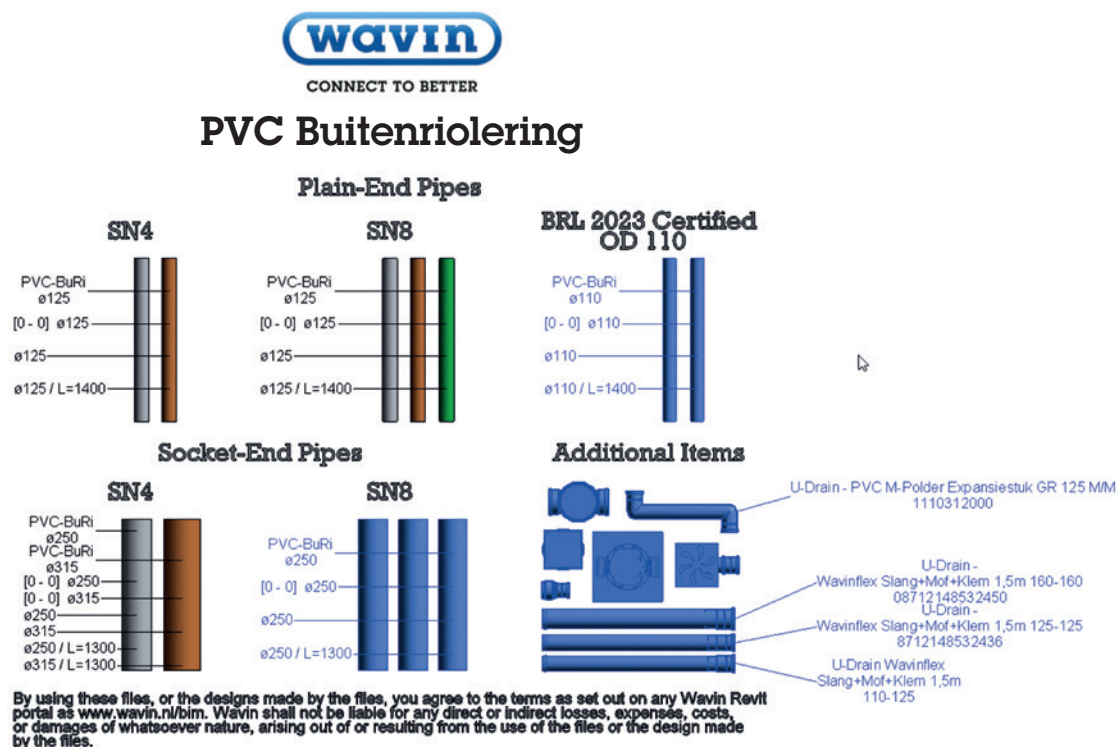
### Importing families:

- 1] Open the Revit package to be imported.
  - Starting view is opened automatically. Starting view contains various pipe types, tags and possibly some fittings.

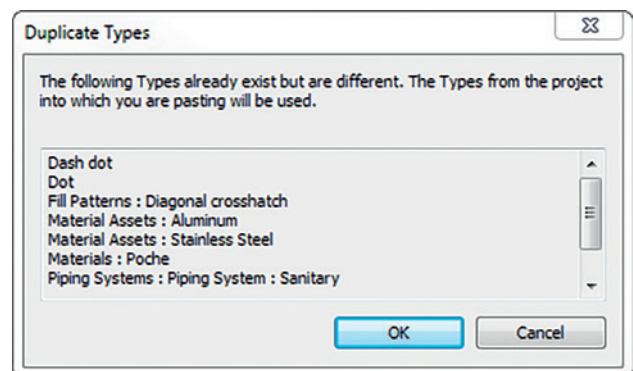


- Wavin has created ready-to-use tags. While annotating the user can choose type of tag and data which is required to be shown in the project.
- Starting view may also include pipe fittings and pipe accessories, which are not included in the routing preferences. They should also be copied in order to include them in the project.

- 2] Having opened the Starting view, select a pipe type(s) along with fittings and all tags to be used in the project.
  - ⦿ There is no need to copy all the pipe types visible in starting view if the user does not want to work with every pipe type.
  - ⦿ Copying only one pipe transfers all the fittings and pipe segments included in its routing preferences
- 3] Choose the “Copy to clipboard” option.
  - ⦿ This way of copying is required in order to transfer the intelligence correctly.

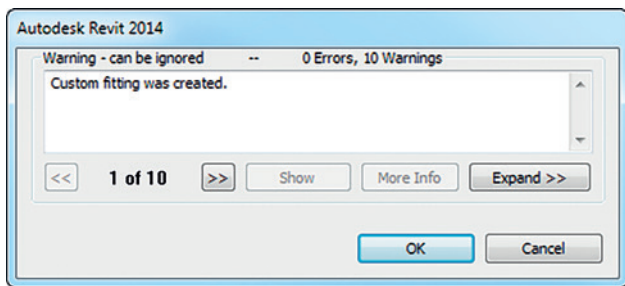


- 4] Go to the target project.
- 5] Open any 2D view or a locked 3D view.
- 6] Use “Paste from clipboard” function.
  - ⦿ In Revit 2014 and Revit 2015, after clicking “Paste from clipboard” a warning informing that copied types already exist in the project may be displayed. Just click “OK”.





- 7] Paste the selected elements in an empty, unused space in the project.
- ⌚ In Revit 2014, after pasting family a warning informing that custom fitting was created may be displayed. Just click “OK”.

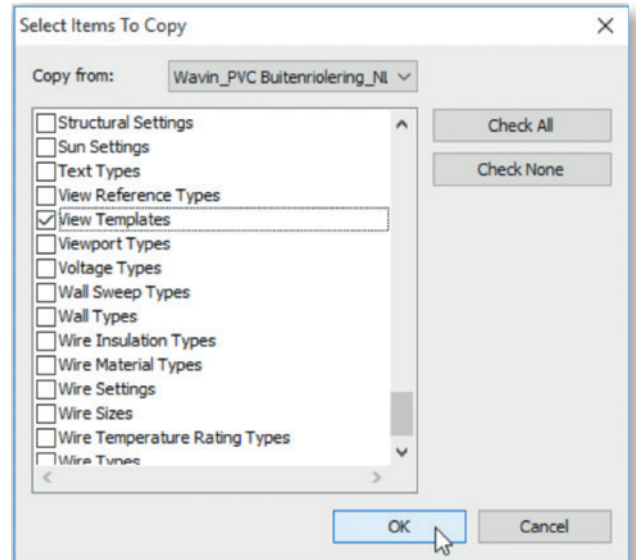


- 8] Click the ‘Finish’ button in Modify ribbon.
- 9] Select pasted elements and delete them.
- 10] The families are now successfully stored in the project and accessible through System ribbon.

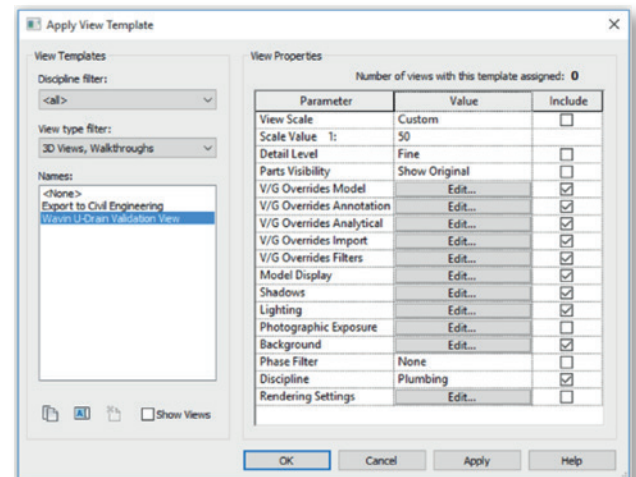
#### Wavin Validation View:

Wavin Revit packages allows the user to check correctness of the items used in the project by highlighting incorrect, or custom fittings using a colour code. Follow the instruction below to import this view.

- 1] Create a new 3D view in the project or duplicate an existing one.
- 2] Go to the Manage ribbon and click Transfer Project Standards.
- 3] A list Select Items to Copy appears.
- 4] Choose the source project name on the top of the list.
  - ⌚ If multiple projects are open, make sure to select the Wavin Revit package.
- 5] Only “View templates” should be selected. Click “OK”.



- 6] Go to the Properties bar of the view. Find Identity Data and click “View Template”.
- 7] A window Apply View Template appears.
- 8] Choose “Wavin Validation View” from the list and click “OK”.

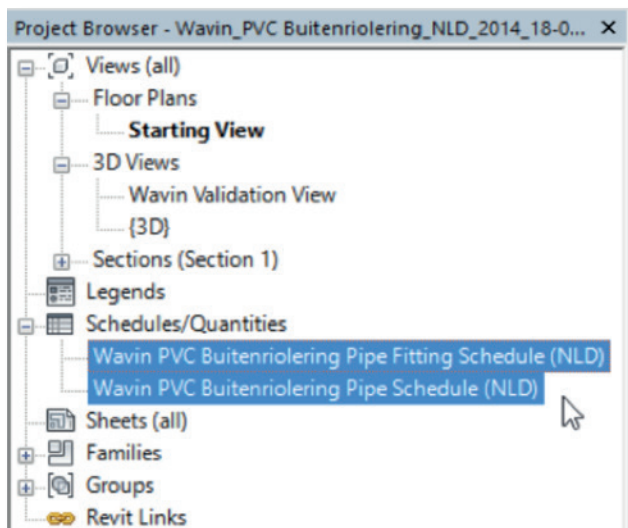


Usage of validation tool is described in section 1.3.

## Schedules:

Follow the steps below to import schedules.

- 1] Go to the Project Browser in Wavin Revit package.  
Find Schedules/Quantities.
- 2] Select all Wavin schedules and after right clicking choose  
“Copy to clipboard”.
  - ⌚ Number of schedules may vary between the systems, depending on the product range.



- 3] Go to the target project.
- 4] Go to the Modify ribbon and click  
“Paste from clipboard”.
- 5] Fully functional bills of material are transferred  
to the project.

## 1.2. Nested families

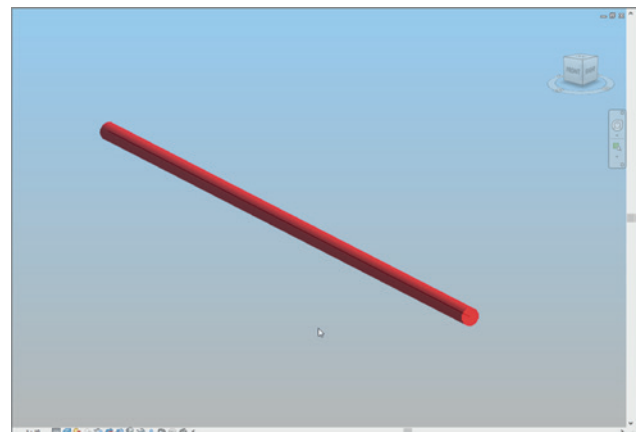
Nested families are components of compound families. Thanks to them, there is no need to insert each item manually.

- ⌚ Nested components should never be inserted into the project manually.

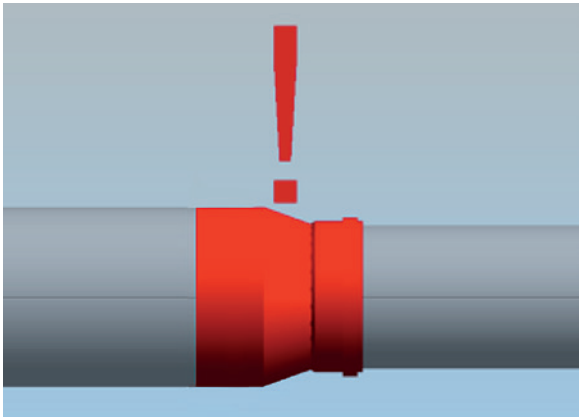
## 1.3. Product Validation View

The view template in the Wavin package allows the user to check whether or not the dimensions or eccentricity of an individual pipe-fitting are valid.

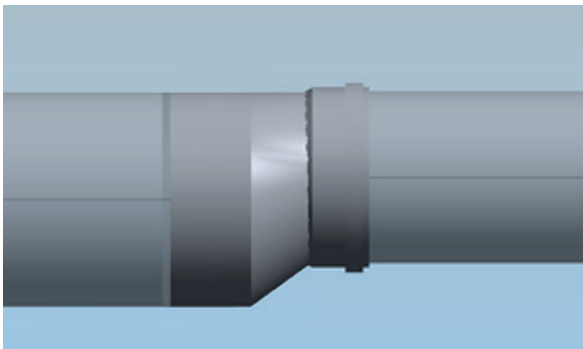
- ⌚ To check validation of the products, go to the 3D view, which has already been created according to the “Product Validation View” in the section 1.3.
- ⌚ If a pipe is longer than available, it will be orange/red.



- ⓘ If a fitting is not available in the product portfolio or a reducer is NOT set to “eccentric” it will be red with an exclamation mark.



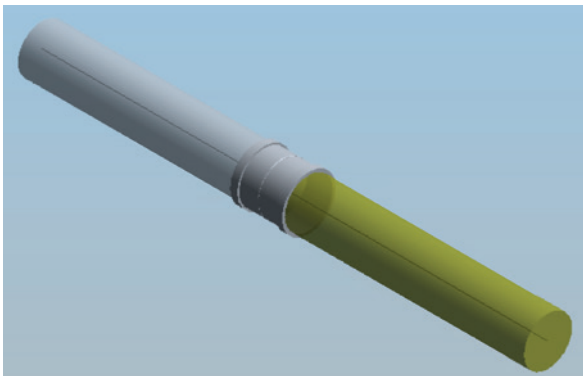
A centric reducer



An eccentric reducer

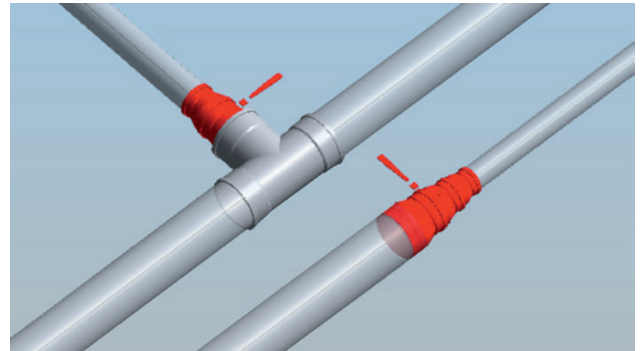
To learn how to work with reducers go to the section 2.2.

- ⓘ If a created fitting is not a Wavin product, it will be green.



#### 1.4. Custom fittings

From time to time user will obtain a message of creating the custom fitting while inserting a reducer or a branch with reducer (nested component). It means that in order to connect elements Revit had to create a fitting which does not exist in the product range. The file will be workable, and all connections will be valid, however custom fittings will not have catalogue numbers in the bill of materials.



If some parts were left in the project as custom fittings they can be easily found later. If the fitting is custom, it will have an exclamation mark next to the connection. It will be easier to notice in the product Validation View, where custom fittings will be highlighted in red.

If there is an exclamation mark next to the reducer, it means that the connection requires further user action. The warning will disappear if the reducer is changed from centric to eccentric, in that case:

- 1] Select custom fitting.
- 2] Switch on checkbox “eccentric”, which can be found in the “Properties” window.
- 3] Reducer is set to eccentric now.



## 2. Wavin Revit packages

### General information

#### 2.1. Working with Pipe Types in Wavin Revit packages

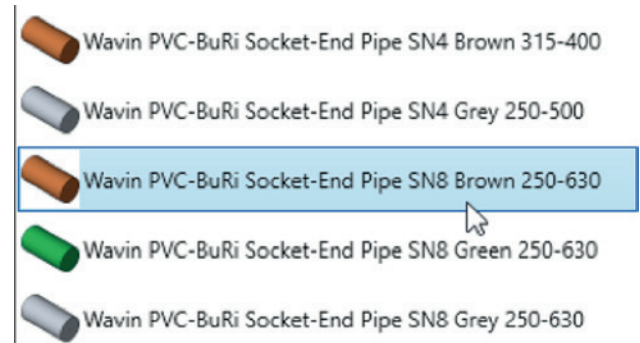
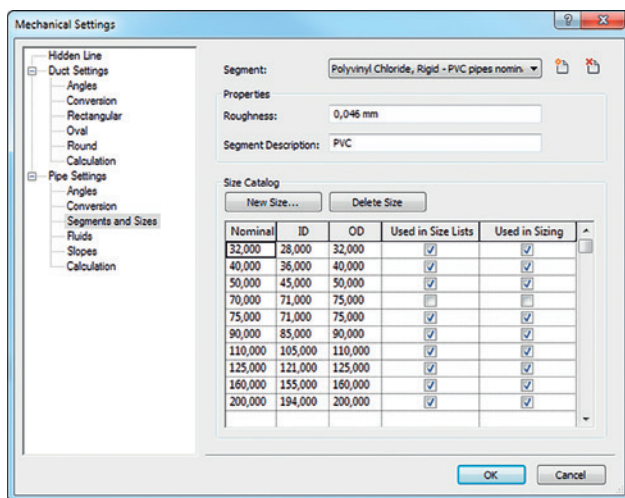
#### Standard Revit

← versus →

#### Wavin packages

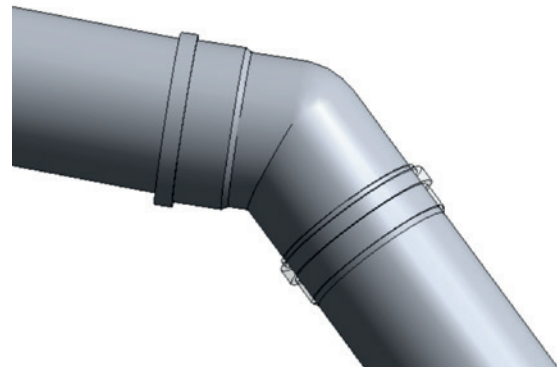
Standard Revit utilises US pipe types only. Only plain-end pipes are supported and they can be drawn in any length.

Uses diameters and pipe lengths available in a specific product portfolio. Both plain-end and socket-end pipes are available.



In Wavin's "accurate installation model" package the following challenges were addressed:

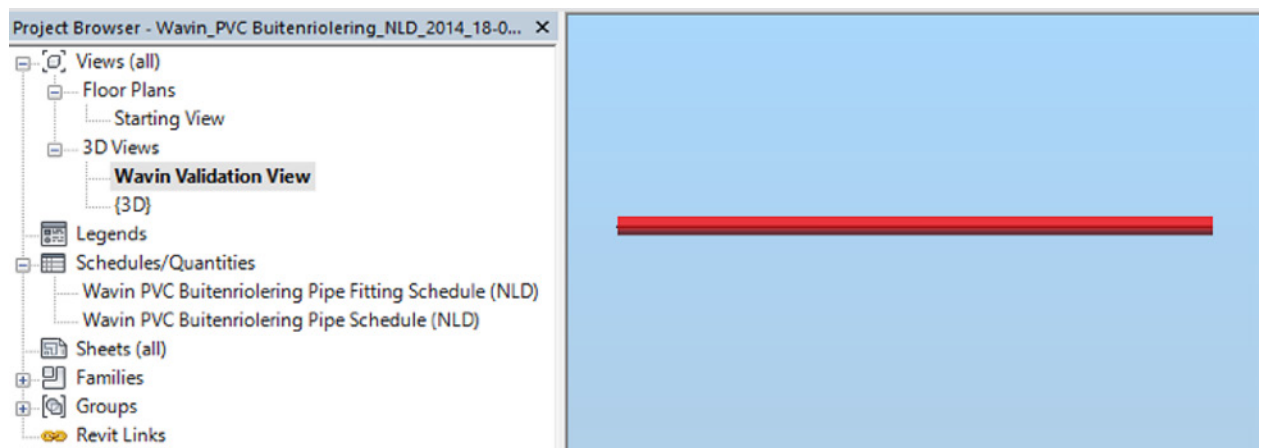
- 1] A product portfolio always contains specific diameters and might contain different colours and socket-end pipes.
  - ⌚ If a product portfolio has multiple colours and/or plain-end pipe and socket-end pipes, Wavin has created a dedicated Pipe Type in the Wavin Revit package.
  - ⌚ Standard Revit only provides working with plain-ended pipes. For the product portfolios, which also have socket-end pipes, Wavin has engineered a work around. Wavin added a virtual socket on each spigot of the fittings when connected to a socket-end pipe.



### Splitting pipe into available lengths.

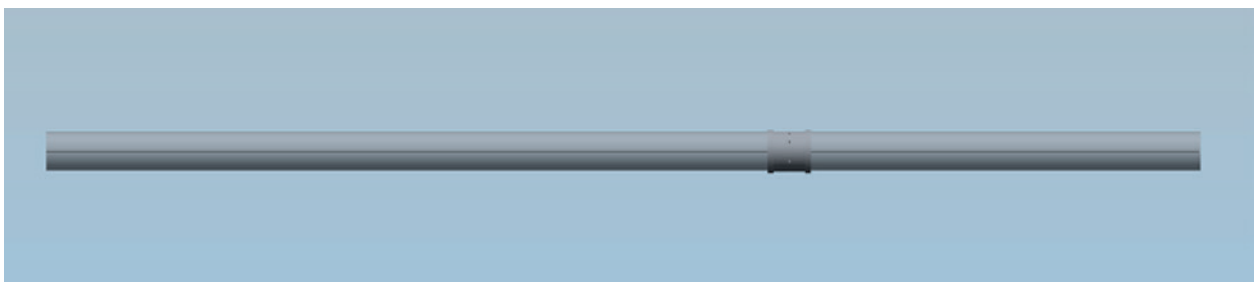
- ⦿ Standard Revit does not have any restrictions on a pipe length. To improve work with Wavin Revit packages, Wavin provides a solution to use pipe lengths, which are available in the product portfolio.
- ⦿ To check whether pipes used in the project are available in the product portfolio, open “Wavin Validation View” in the “Project Browser” window.
- ⦿ If a pipe is orange/red, it requires further action and its length needs to be split into any dimension available in the product portfolio.
- ⦿ Changing pipe length:

a. find and select an orange/red pipe in a “Wavin Validation View”,



b. locate the pipe in the Floor Plan,

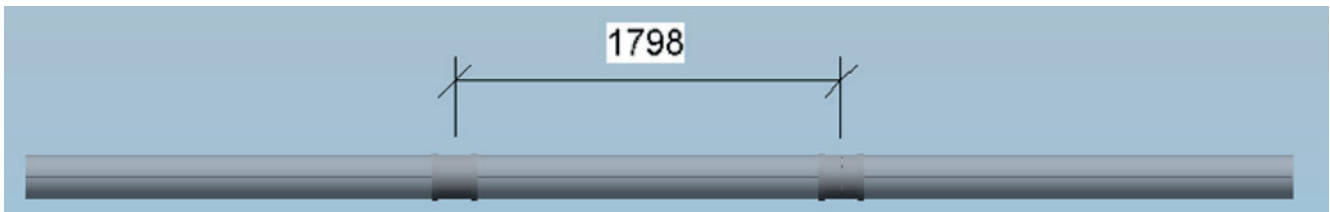
c. split the pipe into sections according to maximum length available,



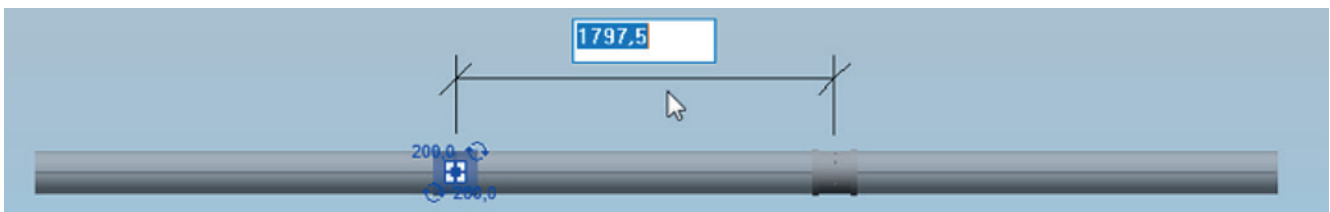
- d. split the pipe anywhere, and create a dimension (using “Aligned Dimension” function) between the two couplers,

⚠ Make sure to attach the dimension to the coupler.

If the dimension gets attached to the end of the pipe, this solution will not work.



- e. select the coupler to be moved, and click at the dimension to edit it.




- f. If the pipe is split properly and its length is available in the product portfolio, the pipe will not be highlighted in the “Wavin Validation View” anymore.

⚠ The same procedure can be used to put in the distance between two couplers, or a coupler, and any other fitting.

This is useful to make sure that on long straights the full pipes are used when possible.

🕒 Also an incorrect length can easily be found by using a “Pipe Schedule”.

Lengths that are not available will be highlighted orange.

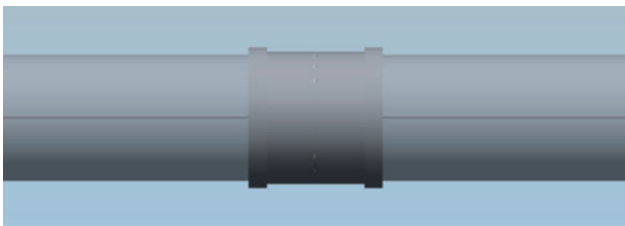
 <Wavin PVC Buitenriolerig Pipe Schedule (NLD)>					
A	B	C	D	E	F
Nr	Diameter Outer	Length (total)	Art. Number	Product Description	EAN
1	110	1,4 m	1000811005	PVC U3 Buis GN 110 L=5 SV	8712148395840
1	110	1,4 m	1010011002	PVC U3 Buis GR KOMO 110 L=2 SV	8712148219979
1	125	1,4 m	1010212005	PVC U3 Buis BR KOMO 125 SN4 L=5 SV	8712148199301
1	125	1,4 m	1000212005	PVC U3 Buis BR KOMO 125 SN8 L=5 SV	8712148096686
1	125	1,4 m	1000812005	PVC U3 Buis GN 125 SN8 L=5 SV	8712148395857
1	125	1,4 m	1010012002	PVC U3 Buis GR KOMO 125 SN4 L=2 SV	8712148227097
1	125	1,4 m	1000012005	PVC U3 Buis GR KOMO 125 SN8 L=5 SV	8712148090783
1	250	1,3 m	1000225005	PVC U3 Buis BR KOMO 250 SN8 L=5 TRM	8712148200014
1	250	1,3 m	1000825005	PVC U3 Buis GN 250 SN8 L=5 TRM	8712148395888
1	250	1,3 m	1010125005	PVC U3 Buis GR KOMO 250 SN4 L=5 TRM	8712148196348
1	250	1,3 m	1000125005	PVC U3 Buis GR KOMO 250 SN8 L=5 TRM	8712148196409
1	315	13,7 m	Length not available	Length not available	Length not available
1	315	1,3 m	1010231005	PVC U3 Buis BR KOMO 315 SN4 L=5 TRM	8712148200427



## 2] Working with plain-end and socket-end pipes.

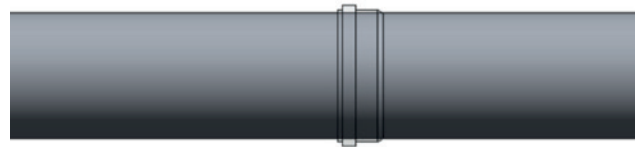
- Standard Revit provides plain-end pipes, but in Wavin Revit packages Wavin improved usage of them by adding a coupler, while connecting a pipe with any pipe fitting. See an example working with plain-end pipe and a coupler below:

- Draw a plain-end pipe (choose a proper pipe type in the Properties window).
- Split the pipe.
- A coupler is inserted.



- As standard Revit does not provide socket-end pipes, Wavin made it possible to visualize them. Follow the procedure below to learn how to work with socket-end pipes:

- Draw a socket-end pipe (choose a proper pipe type in the Properties window).
- Split the pipe.
- A socket is inserted.

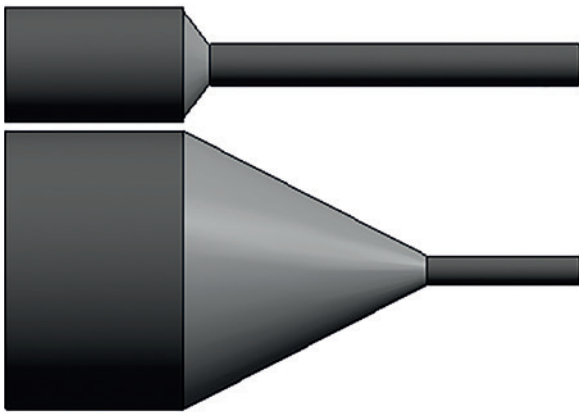


- In Wavin Packages it should be correct, whether the elements connecting pipes to fittings are correct for the chosen pipe-type, as both pipe-types are available. To learn more about working with plain-end and socket-end pipes go to the chapter 3.

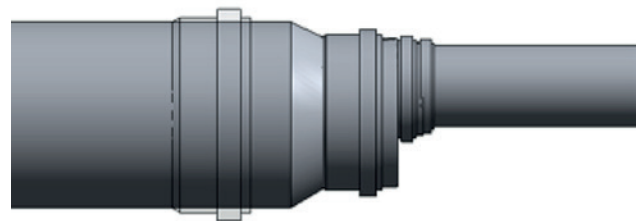
## 2.2. Working with Reducers in Wavin Revit packages

### Standard Revit ← versus → Wavin packages

Every reducer connecting any two diameter is possible and is always visualised in the same way.



In soil and waste systems only eccentric reducers should be used keeping the top of the two pipes at the same level.



Often more than one reducer is required.

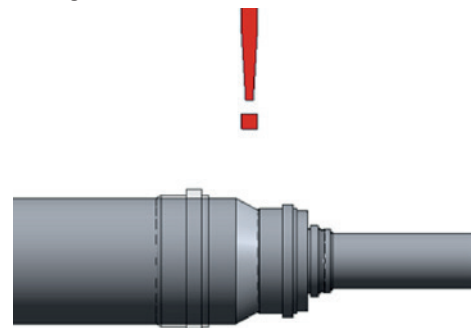
In Wavin's "accurate installation model" package the following challenges were addressed:

#### 1] Often more than one fitting is required to connect the two different diameters

- ⦿ If more fittings are required, the intelligence of the Wavin Revit package automatically inserts the right combination of reducers.

#### 2] In soil and waste ranges eccentric reducers should be used. The eccentricity should be positioned keeping the top of the two pipes at the same level. Centric reducers will be treated as custom fittings.

- ⦿ By default, Revit places the centre line of the two different diameters at the same level.
- ⦿ Due to this, a temporary "custom fitting", a centric reducer is placed and the user will be notified by an exclamation mark next to the fitting that this product does not exist in the portfolio.
- ⦿ In the dedicated Wavin Validation View supplied with the Revit package, all custom fittings will be red.
- ⦿ If reducers are available in both a short as well as a long version, by default the short version is placed. Changing to a long version by selecting the checkbox "Reducer Long".



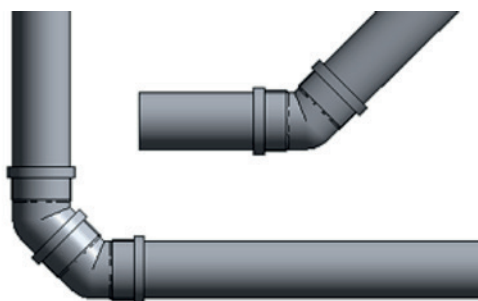
### 2.3. Working with Bends in Wavin Revit packages

## Standard Revit ← versus → Wavin package

It is possible to create a bend with any angle and it is always visualised in the same way. Only symmetric spigot bend with the same working lengths is available.



Only bends that are available in the product portfolio can be designed. A great variety of bends is provided – symmetric and asymmetric, spigoted and socketed.



In Wavin's "accurate installation model" package the following challenges were addressed:

#### 1] Great variety of bend types available in Wavin product portfolio

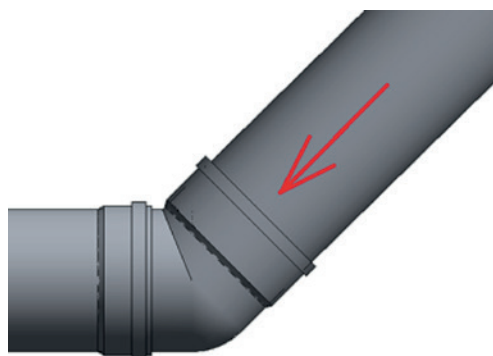
- ⌚ Depending on a specific product range, various bend types can be inserted.  
The default type is a standard bend available in all sizes. It can be changed it into a specific bend type afterwards.

#### 2] Specific diameters and angles of bends available

- ⌚ According to product portfolios, the 15°, 22°, 30°, 45°, 67° and 90° bends can be drawn.  
Most of them can be inserted automatically by drawing two pipes at a proper angle.

#### 3] Depending on the water flow direction, bends may need to be reversed in soil and waste systems.

- ⌚ Depending on the direction of drawing some bends may require changing the flow direction.  
In such event use the checkbox "Reverse Direction" in the Properties window.

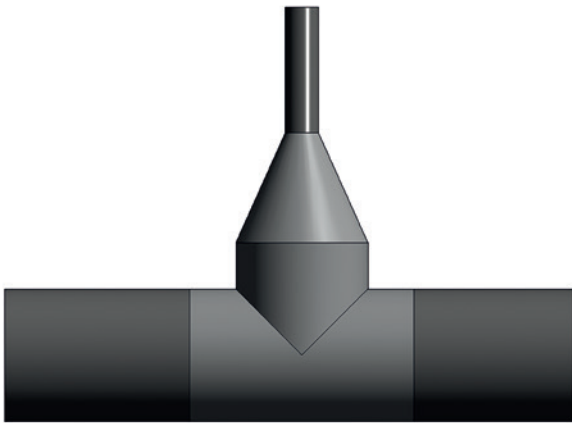




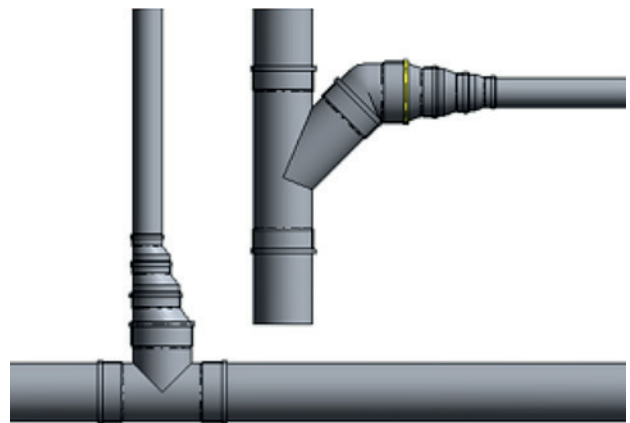
## 2.4. Working with Branches in Wavin Revit packages

### Standard Revit ← versus → Wavin package

Branch connecting any diameter is possible to insert and it is always visualised in the same way. Only equal branches with centric reducers are available.



Only branches available in the product portfolio can be designed. According to product range a great variety of specific types of branches is provided, both equal and unequal ones.



In Wavin's "accurate installation model" package the following challenges were addressed:

#### 1] Specific diameters and angles of branches available

- ⚠ In order to draw a branch upgrade an existing elbow by pressing "+" or connect two pipes together. Some branches need to be inserted manually. Go to the section soil and waste or hot and cold general issues to find more specific information.

#### 2] Great variety of branch types and their functionalities in Wavin product portfolio.

- 🕒 Depending on product range, various branch types can be inserted. Soil and waste Wavin Revit packages provide equal and unequal tees, with centric or eccentric reducers.
- 🕒 Default type is a horizontal main pipe connected to a vertical branch.

#### 3] By putting intelligence into Wavin Revit packages, there is no need to insert reducers manually.

- 🕒 If applicable, a proper reducer or set of reducers is inserted automatically (as a nested component) so the user does not need to assemble it themselves.

## 2.5. Working with Unions in Wavin Revit packages

### Standard Revit ← versus → Wavin package

Standard Revit provides only visualization of a coupler.  
The working length of the fitting is not correct.



According to product range a great variety of specific types of unions are provided. The working length of the unions is correct.



In Wavin's "accurate installation model " package the following challenges were addressed:

#### 1] Correct working lengths enable correct pipe connections

- ⌚ While splitting a pipe, the connection points account for the depth of the socket.

#### 2] A wide variety of union types are available in product ranges.

- ⚠ In Below Ground different couplers can be chosen, as: access pipes, pipe sockets, compensator sockets, double socket, transitions and expansion sockets.
- ⚠ In Below Ground systems, depending on a pipe-type, a proper type of union should be used.  
For plain-end pipes a coupler is set as a default union. For socket-end pipes a dummy socket will be used instead of a coupler.

## 3. Below Ground

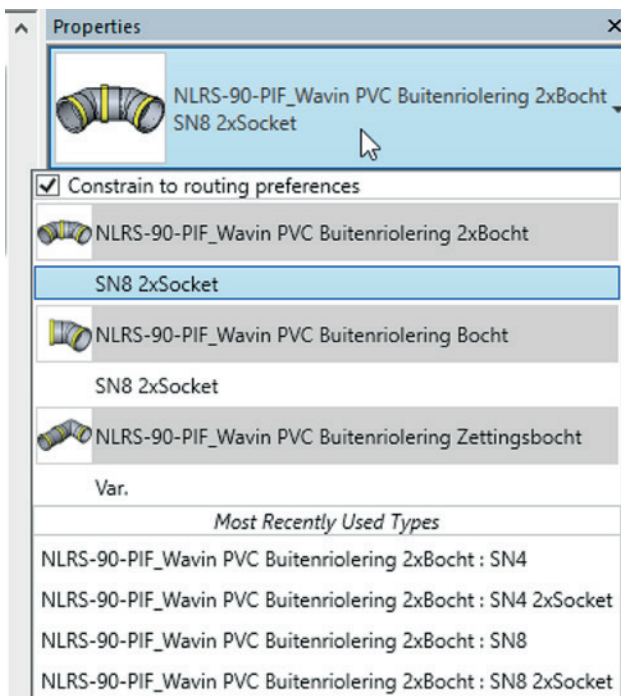
### General information

#### 3.1. Bend

##### Inserting a specific bend type

By drawing two pipes at the correct angle a default bend will be inserted.  
To change it into a specific bend type follow steps below:

- Draw a standard bend connecting two pipes.
- Select the bend.
- Go to the “Properties” window and open the list by clicking the bend picture as shown below.



- Turn on “Constrain to routing preferences” checkbox to limit the list of various bend types.  
This additional functionality prevents inserting a nested component.
- Choose a bend type from the list.
- Move the mouse to the Main window or click the “Apply” button at the bottom of the “Properties” window to see the changes.

##### Changing features and properties of bends

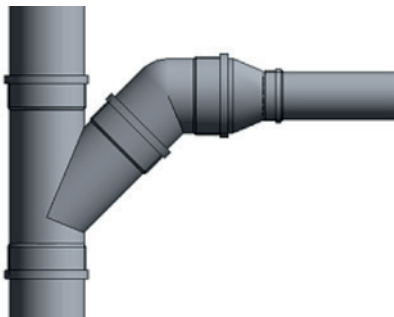
Wavin Revit packages provide additional functionalities, which enable changing properties of bends. Some of them are available only for specific bend types. To change the properties of the fitting go to the “Properties” window. By selecting checkboxes the following functions can be turned on/off:

- Reverse direction – to change a direction of the bend,
- Add Pipe – to insert a pipe between two bends.

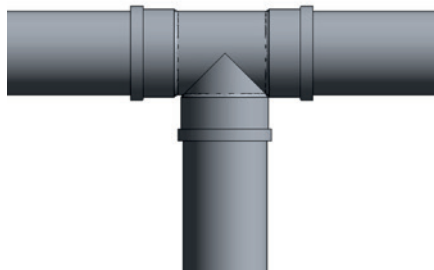
### 3.2. Branch

#### Two different options of tee connections provided

Considering usage of the tee, hydraulics optimization and avoiding negative pressures, the following solutions can be chosen:

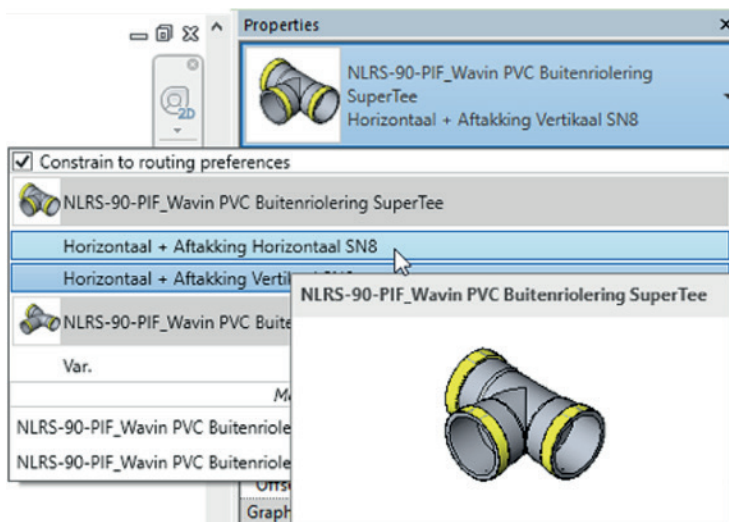


Horizontal branch  
entering a horizontal main pipe



Vertical branch  
entering a horizontal main pipe

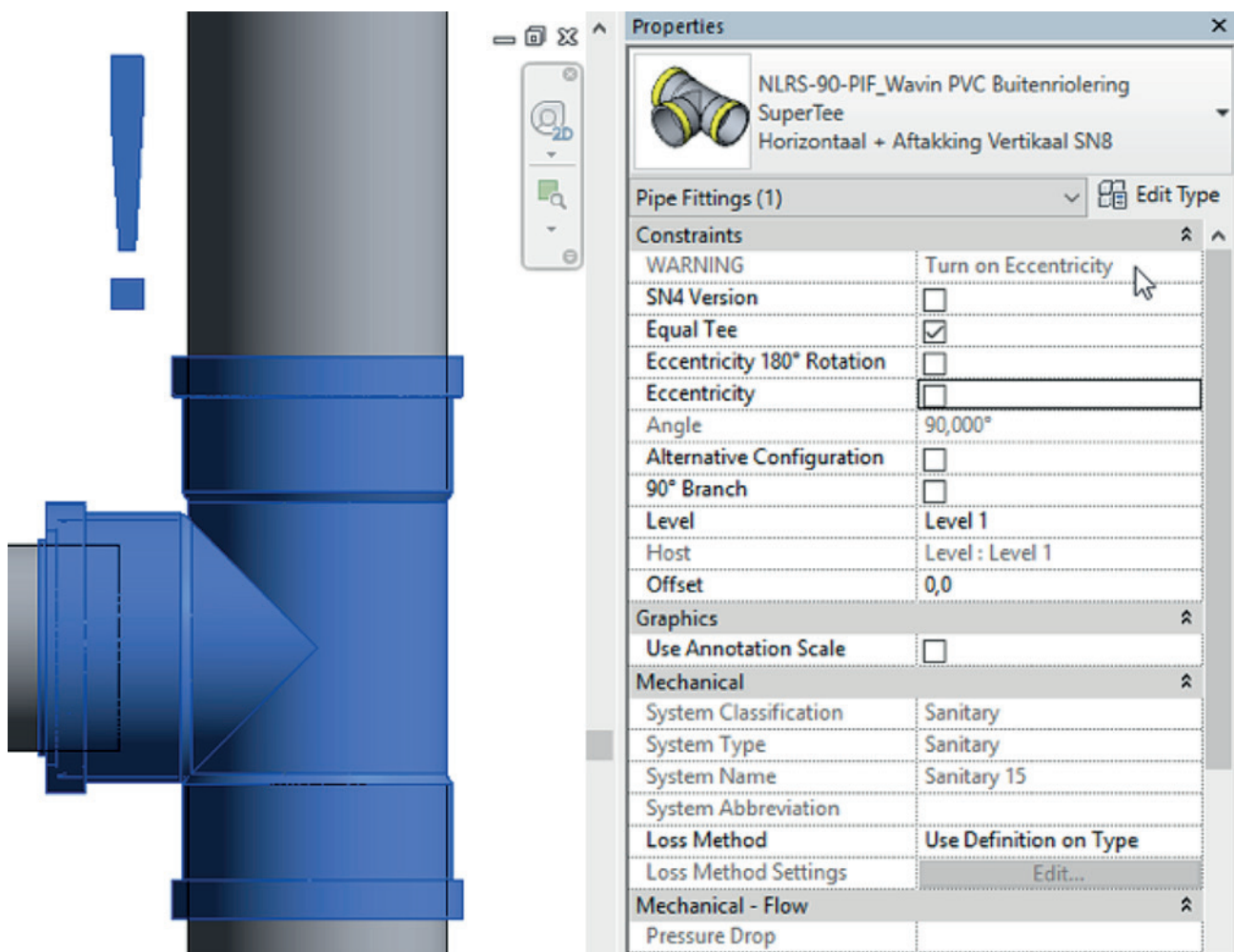
- For a horizontal branch connected to a horizontal main pipe it is recommended to use an equal tee, for other cases use an unequal tee if possible.
- A vertical branch entering a horizontal main pipe is set as a default. To change it into another option follow the procedure below:
  - a. Go to the “Properties” window and open the list by clicking the branch picture as shown below.



- b. Choose a branch type from the list.
- c. Click the “Apply”.

## Working with reducers

In every instance of reducer, or reducer group, “eccentricity” needs to be turned on manually since Revit automatically inserts reducers as centric ones, which may not be available in the product range. A red exclamation mark will be displayed along with a warning in the “Constraints” chapter of the “Properties”).



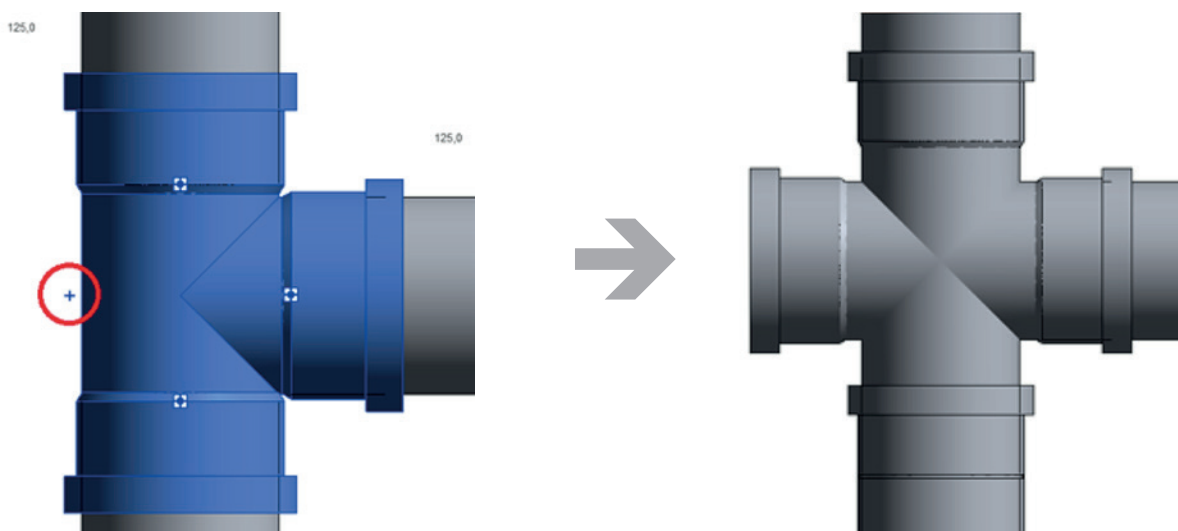


### 3.3. Double Branch

#### ➤ Inserting a double branch

Wavin Revit packages contain also a great variety of double branches with different family types, dimensions and angles. To insert a standard double branch follow the steps below:

- a. Draw a standard branch.
- b. Select a branch.
- c. Click the “+” to create a new connector.
- d. This will insert a double branch, start drawing pipe from the new connector.



In more demanding scenarios, you can find the family in the Project Browser and drag it's type onto any pipe.

#### ➤ Changing a double branch type

Depending on the system, other double branch family types are available and can be inserted into the project:

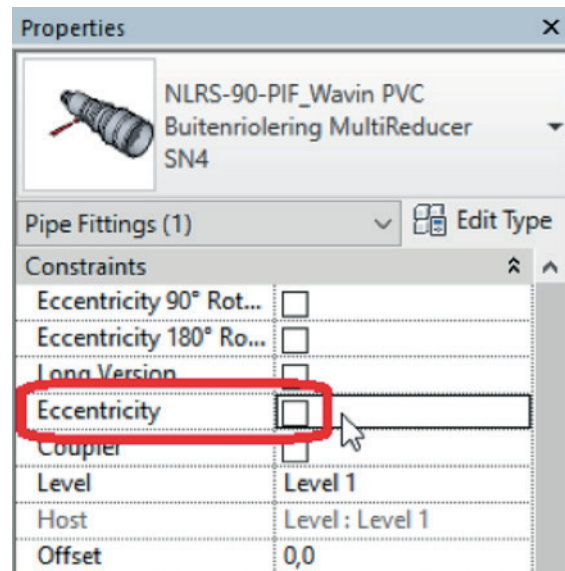
- a. Having a standard double branch inserted, select it.
- b. Go to the Properties window and choose another type of double branch.
- c. Click the “Apply”.

### 3.4. Reducer

#### Changing a reducer from centric to eccentric

Only eccentric reducers should be used, in this case follow steps below to replace a centric reducer with an eccentric one:

- Apply slopes to horizontal pipes before changing centric reducers into eccentric.
- Select the custom fitting (centric reducer).
- Select checkbox "Reducer Eccentric".
- Click the "Apply".
- If required, rotate the reducer by either selecting Reducer Rotate 90° resp. 180° or by using the standard Revit Rotate functionality.



### 3.5. Union

#### ➤ Inserting a union

A union is inserted when a pipe is split into two elements. For plain-ended pipes a coupler is set as a default union. For socketed pipes a socket is set as a default union. To insert a union follow the steps below:

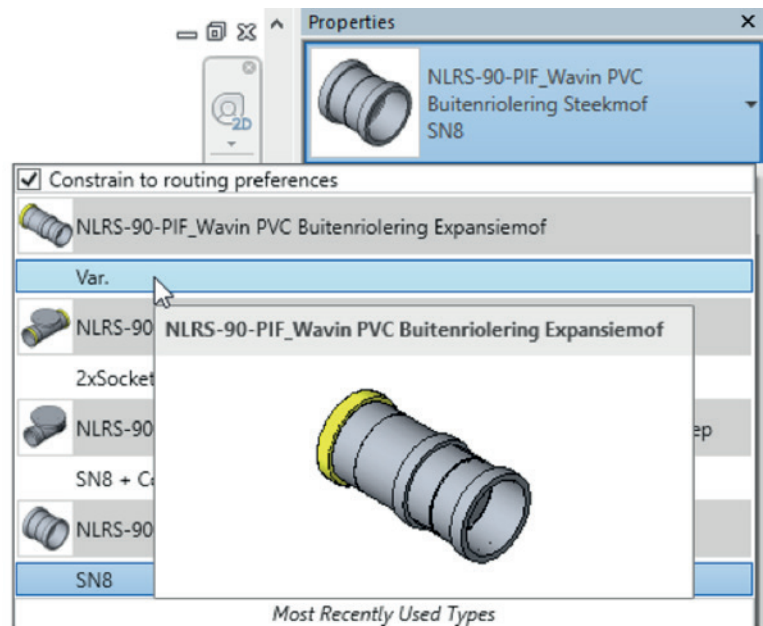
- Draw a pipe.
- Select pipe and split it.
- A default union is inserted.



#### ➤ Changing a union

To replace a default union type into a specific one follow the steps below:

- Insert a default union as shown above.
- Select union.
- Choose another type of union from the “Properties” window to replace it.
- Click “Apply”.



#### ➤ Changing features and properties of unions

Wavin Revit packages provide additional functionalities which enable changing features and properties of the unions. Some of them are available only for specific union types. To change properties of the fitting go to the “Properties” window. By selecting checkboxes the following functions can be turned on/off:

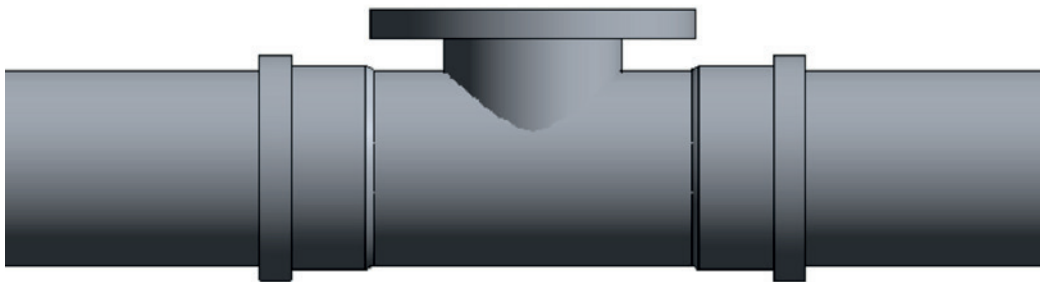
- Reverse Direction – to change a direction of the union,
- Force Socket Connection – to choose socket as a connecting element,
- Show Spigot End – to remove connecting elements (for example when connecting the fitting to another fitting).

### 3.6. Access Pipe

#### ➤ Inserting access pipe

Wavin Revit packages for soil and waste systems provide access pipes with different dimensions, depending on the product range. Please follow the steps below:

- a. Draw a coupler (according to procedure in section 3.5).
- b. Select the coupler.
- c. Go to the Properties window and choose an access pipe from the list.
- d. Click the "Apply". A coupler has been replaced by the access pipe.



#### ➤ Changing features and properties of access pipes

To set other properties of the access pipe go to the "Properties" window. By selecting checkboxes the following functions can be turned on/off:

- a. Reverse Direction - to change a direction of access pipe,
- b. Show Spigot End – to remove connecting elements (for example when connecting fitting to other fitting),
- c. Force Socket Connection – to choose socket as a connecting element,

#### ➤ Rotating a fitting

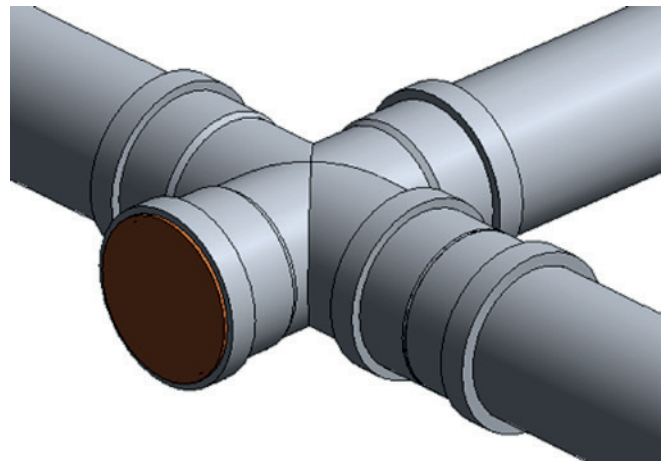
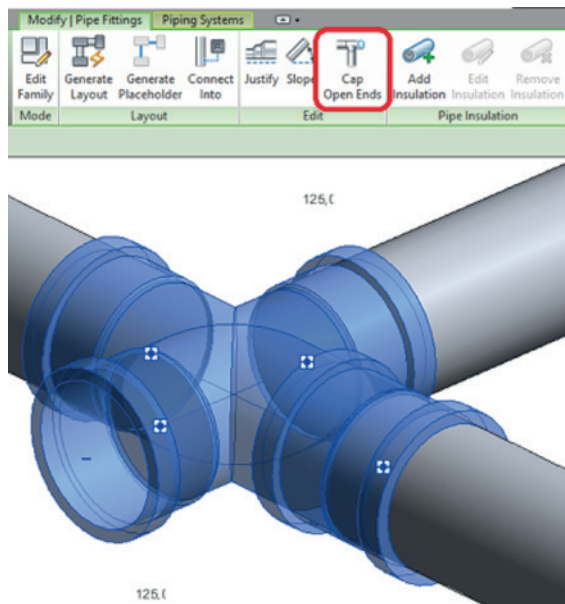
To rotate the access Pipe use the standard Revit function.

### 3.7. End cap

#### ➤ Inserting an end cap

Wavin has supplied packages with end caps to cover the end of a pipe or a pipe fitting. To insert an end cap follow the procedure below:

- Select a pipe or a pipe fitting, which has at least one connector not in use.
- Go to the Modify ribbon and click “Cap Open Ends” function.
- The end cap is inserted automatically.



#### ➤ Changing features and properties of end caps

There is a possibility, that cap inserted in the fitting is of the type meant for pipes, or the other way around. To fix such situations, simply change the cap's type.

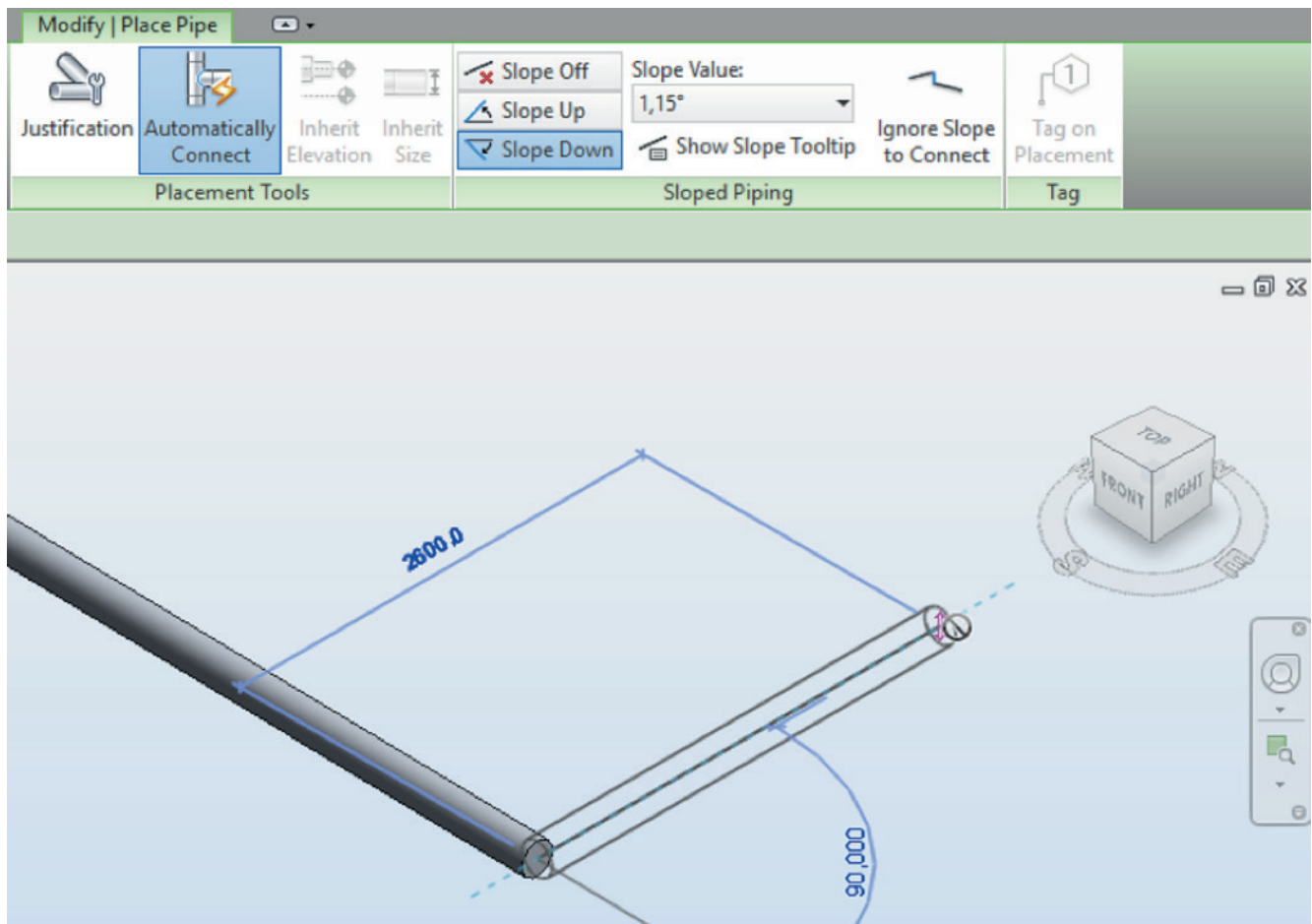


### 3.8. Working with slopes

There are several ways of creating slopes with S&W piping systems. In this section they are covered starting with the ones easiest to apply, and finishing with the most reliable ways.

#### Method 1

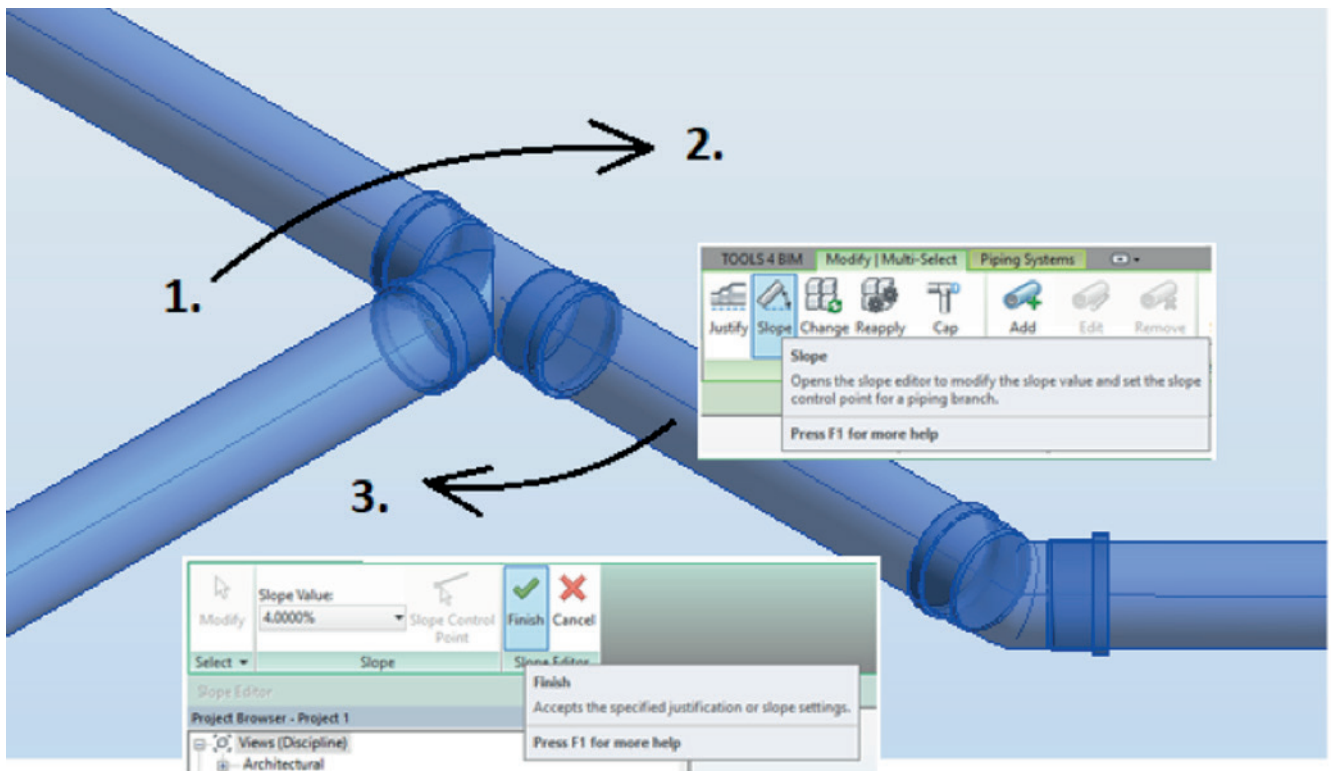
Drawing with “Slope Up” or “Slope Down” option ON – set slope is automatically applied on every pipe drawn.



## Method 2

Use of “Slope” option on system that has been created with no slopes.

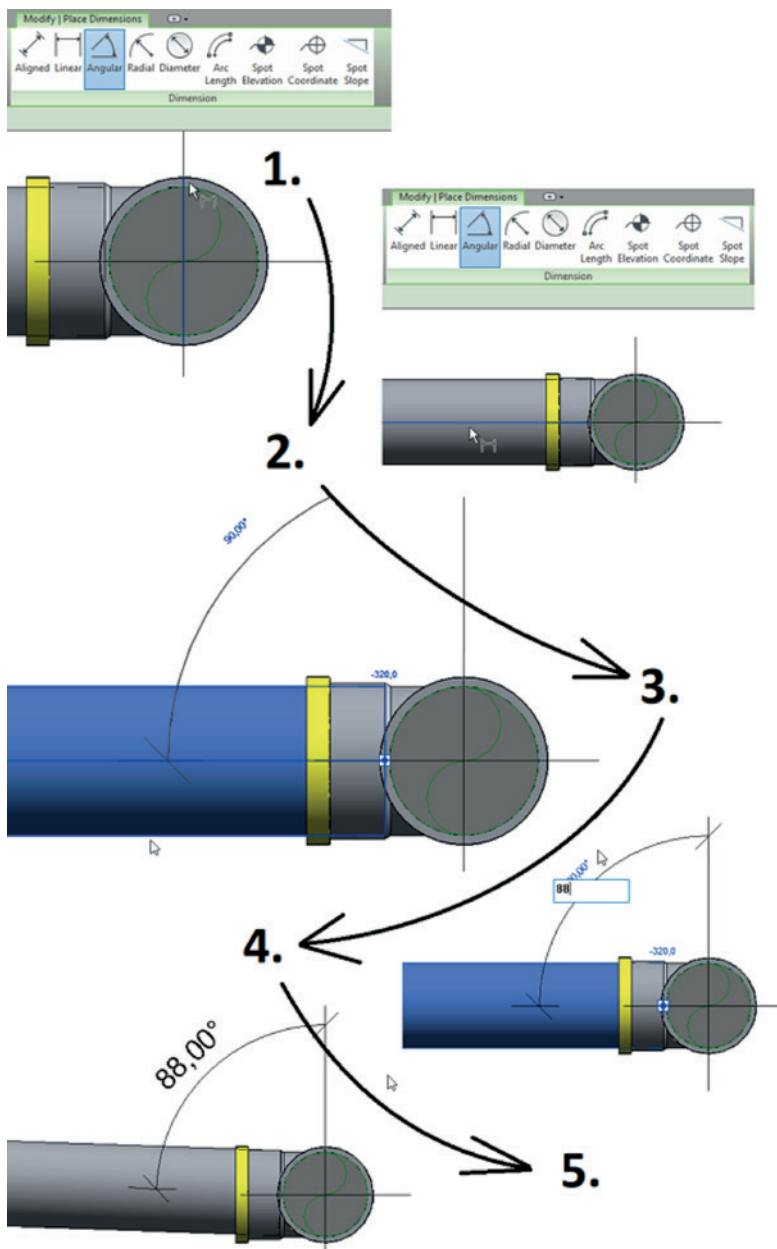
- Use TAB key to select all system components, and click to confirm the selection (1.).
- Go to “Modify” ribbon, and activate “Slope” function (2.).
- Select “Finish” to apply the slope (3.).



### Method 3

Angle Dimension annotation tool.

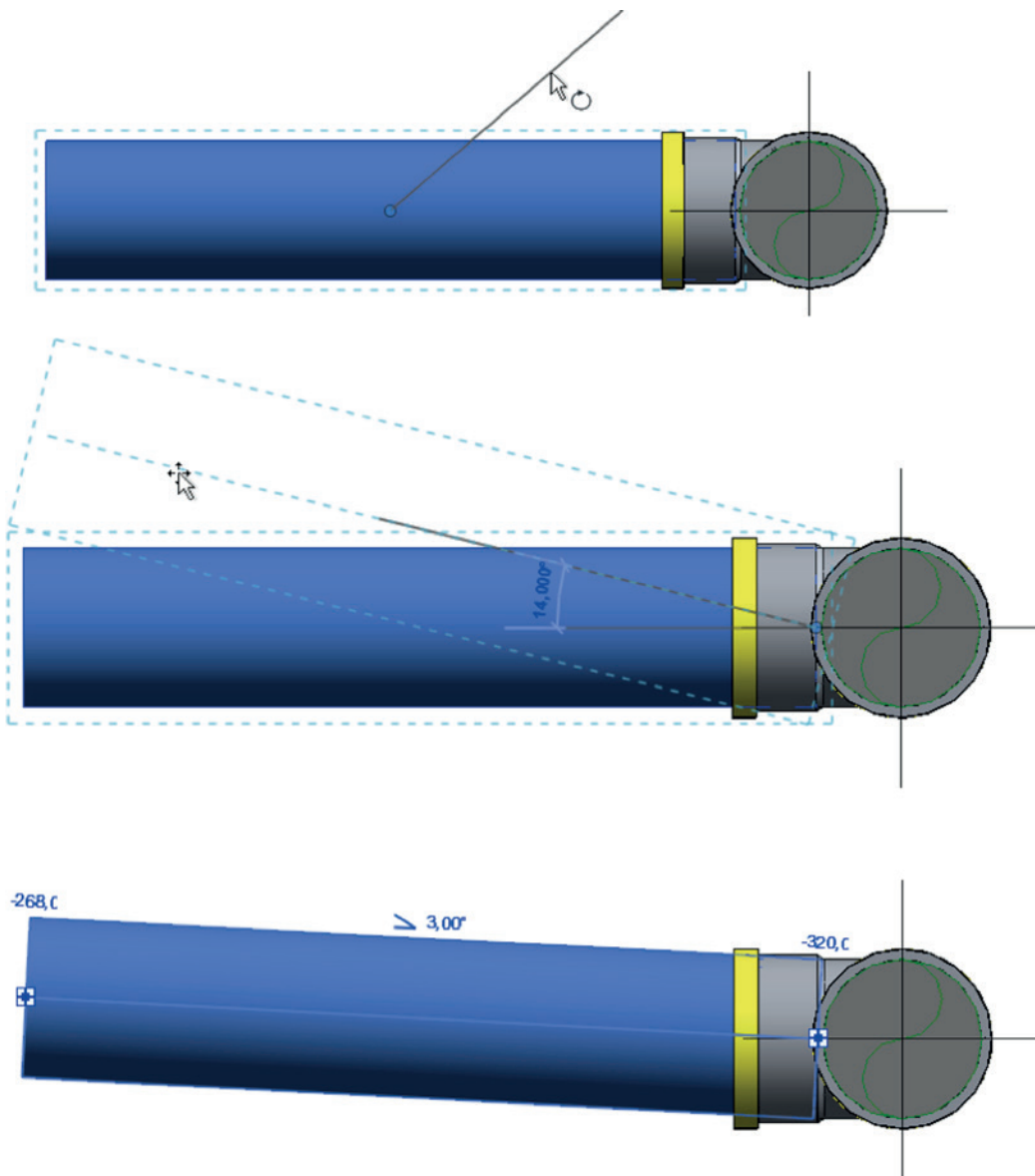
- Go to an "Elevation" or "Section" view which shows the branch pipe
- Create an "Angular Dimension" between reference perpendicular to the branch pipe (1.), and the target branch pipe (2.)
- Select the branch pipe (3.)
- Click on the "Angular Dimension's" value, and change it to a desired value (4.)



#### Method 4

Rotate tool in Modify Ribbon.

- Go to an "Elevation" or "Section" view which shows the horizontal pipe.
- Selecting the target pipe, and go to the "Rotate" tool in "Modify" ribbon.
- Move the rotation base point to the pipe's end, and onto its center axis.
- Click, and rotate using mouse, or by typing in the desired angle of rotation.

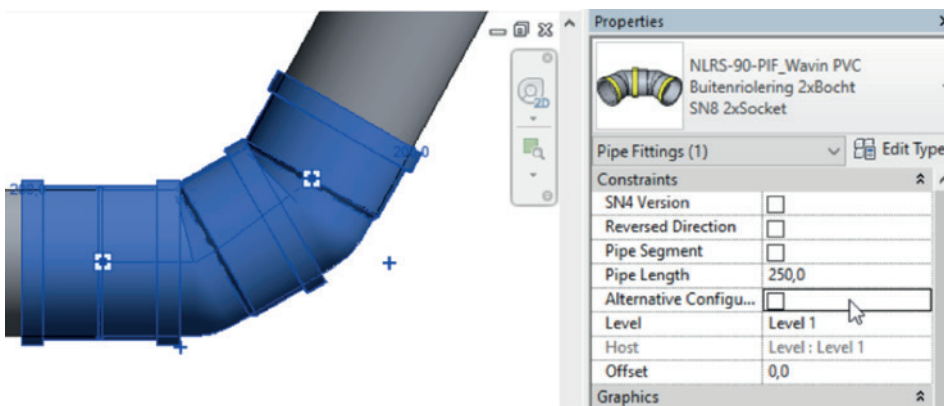


## 4. Product range specific issues - Below Ground

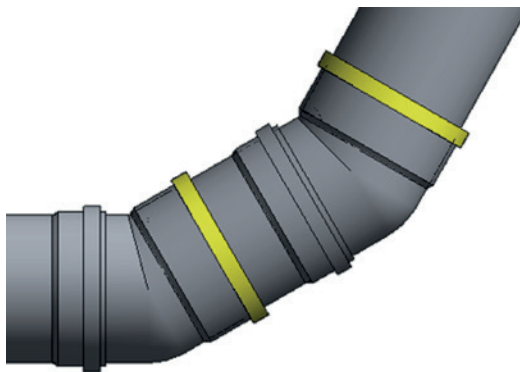
### 4.1. Wavin PVC Buitenriolering

#### ➤ Bend configurations

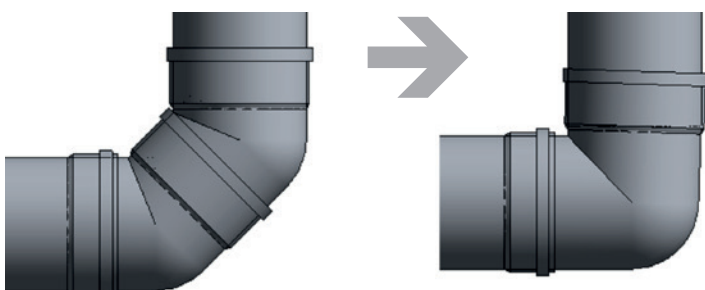
In PVC Buitenriolering, default bend solution inserts either a bend or a two bend composition, with a possibility to add a pipe segment in between them. What's inserted first is a recommended configuration, but the user can further customise the output by ticking the checkboxes of the family:



- "Use SN4 Fitting" forces the use of SN4 certificated fittings in the solution.  
In most cases SN8 fittings have yellow collars around their sockets, while SN4 are simply grey.
- "Reverse Direction" changes the orientation of inserted bend/bends to match the flow direction.
- "Pipe Length" and "Insert Pipe Segment" allow to insert a pipe segment in between the bends.



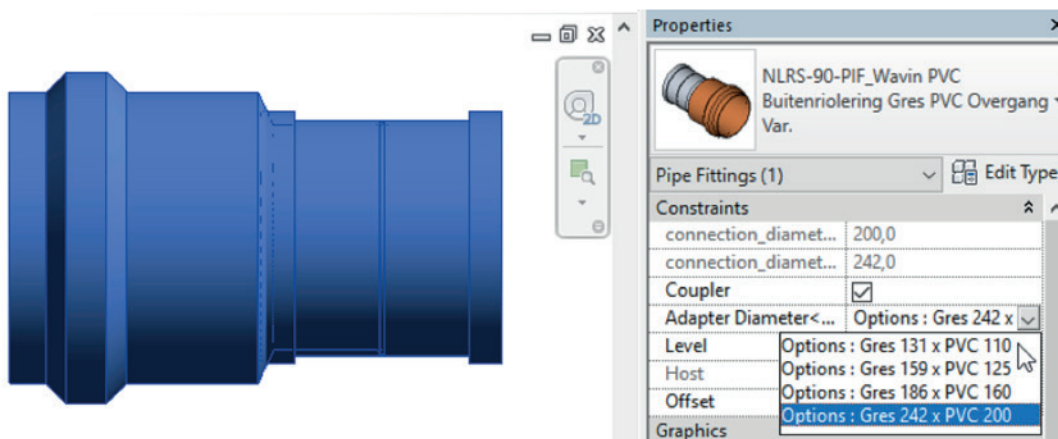
- "Alternative Configuration" allows to change the configuration when possible, example:





### ➤ Gres to PVC Transition

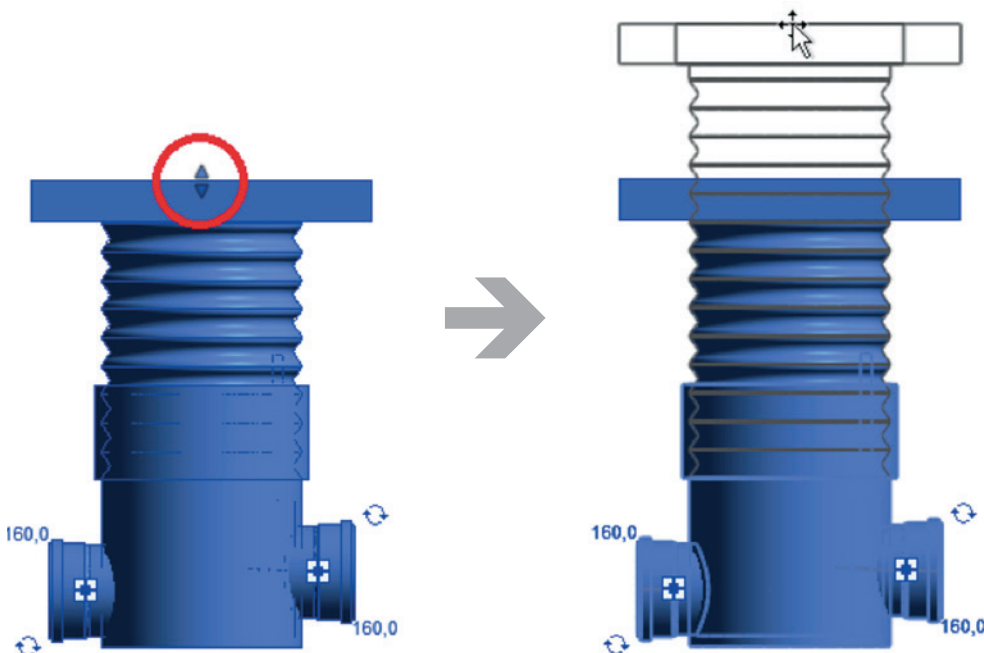
This transition reducer is used whenever transition from Gres to PVC Buitenriolering is needed. To use it, simply drag it into the project. When it's selected, desired transition can be selected from the drop-down list in the Properties Tab:



### ➤ Basic 315 mm Inspection Chambers

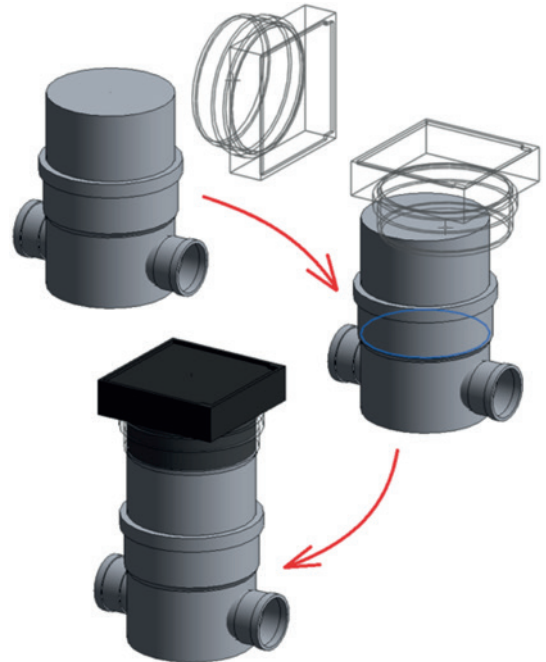
The package contains four small inspection chambers, including one with a valve. To use them, simply insert them into the project from the Families List in the Project Browser, or via Systems Ribbon from the Pipe Fittings list in the Properties.

Valved one instead of a regular PVC pipes, uses dedicated corrugated shaft pipe. To customise it's shaft length, change "Shaft Height" parameter. Alternatively, there is a possibility to drag the arrow icon or to align the shaft cover with desired plane.



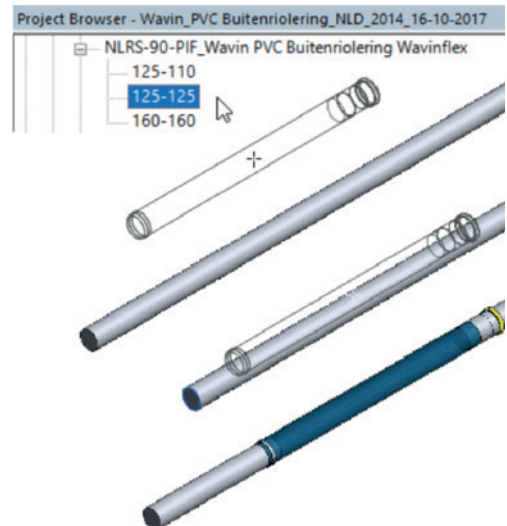
### ➤ PVC Pipe Shaft Cover

To place a cover to a shaft made out of a socketed 315 mm PVC pipe, simply drag the family to the project, and place it onto the pipe's end. Family positions itself correctly when mouse is hovered close to the pipes end.



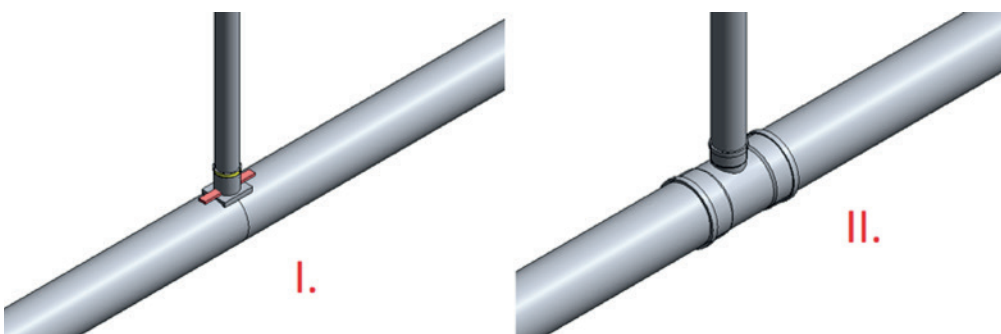
### ➤ WavinFlex

This specific item can be inserted from the Project Browser or via Systems Ribbon and Pipe Fittings option. It is available in three versions depending on used pipes' diameters: 125, 160 and 110/125. Best way to have it inserted is to place it onto the pipe. If there is a need to have it reversed, simply use space bar before placing it onto the pipe.



### ➤ Click Inlets

PVC Buitenriolering range has click inlets which are used when branch is vertical in a junction. These fittings are set as a priority in such scenarios. If no click inlet is available, a branch is inserted instead.



## 4.2. Wavin TEGRA

### General information

TEGRA inspection chambers are available in base diameters 425, 600 and 1000mm.

Depending on required base, number of outlets, their diameters and angles differ.  
User can choose from one outlet up to four outlets.


### Possible angles between outlets allow for:

- 90, 120, 150 and 180 degrees for two connectors,
- 90 degrees for three connectors,
- 45 and 90 degrees with four connectors.

### Possible outlet diameters:










- From 160 to 315 mm with a 425 Base,
- From 200 to 400 mm with a 600 Base,
- From 250 to 500 mm with a 1000 Base.

Inserting one chamber, brings up all the elements and their codes required to build customised chamber, all scheduled in a designated schedule for TEGRA.



CONNECT TO BETTER

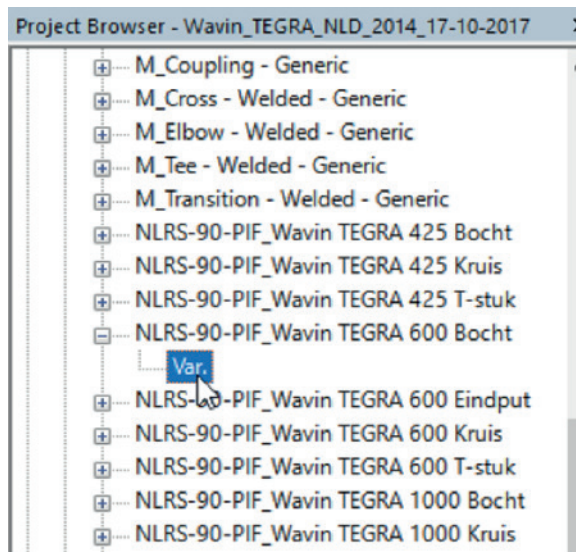
**TEGRA**

	425	600	1000
<b>Eindput</b>			
<b>Bocht</b>			
<b>T-Stuk</b>			
<b>Kruis</b>			

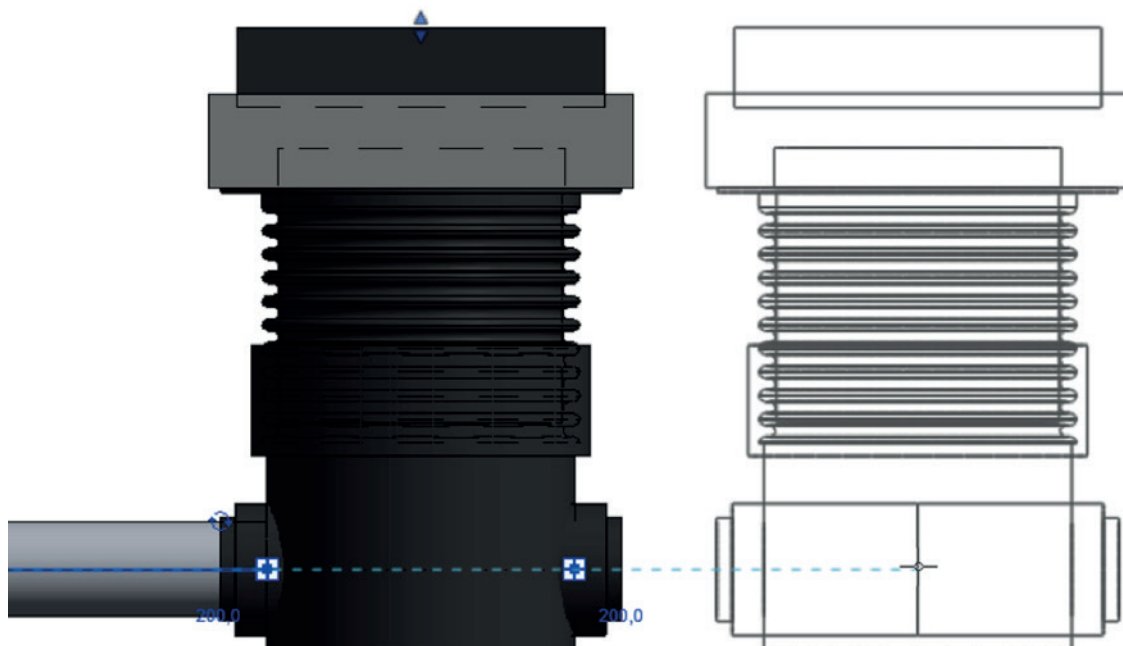
By using these files, or the designs made by the files, you agree to the terms as set out on any Wavin Revit portal as [www.wavin.nl/bim](http://www.wavin.nl/bim). Wavin shall not be liable for any direct or indirect losses, expenses, costs, or damages of whatsoever nature, arising out of or resulting from the use of the files or the design made by the files.

## Inserting the chamber

To insert a chamber, simply find it on the Pipe Fittings list in the Properties Tab, accessible through Systems ribbon. It can also be found in the Project Browser and dragged into the project.

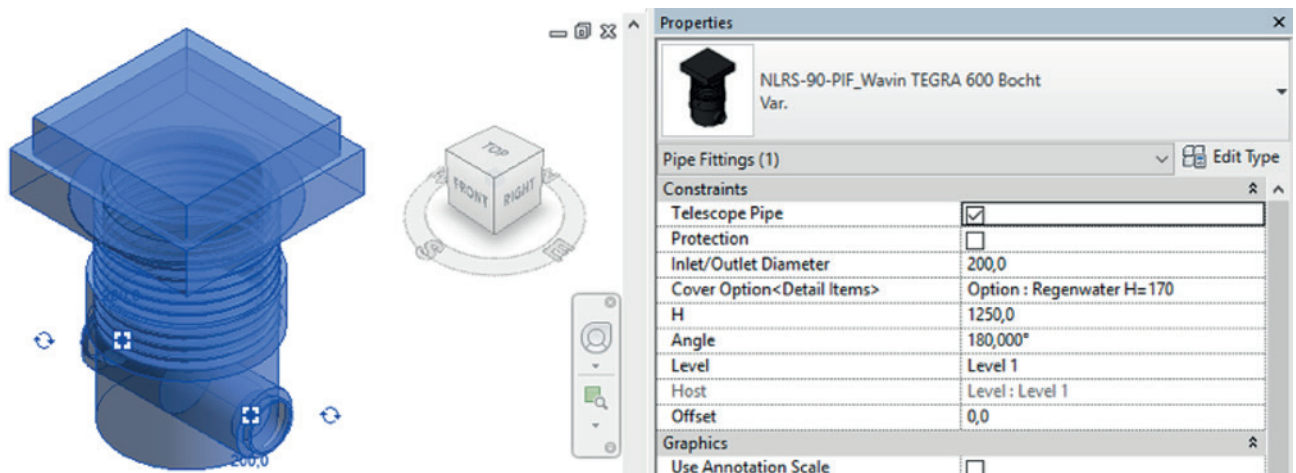


Because of the specific nature of inspection chambers, it's best to work with them in section views. Family offset shows level of it's outlet axes. Chamber can be also placed at the end of an existing pipe.

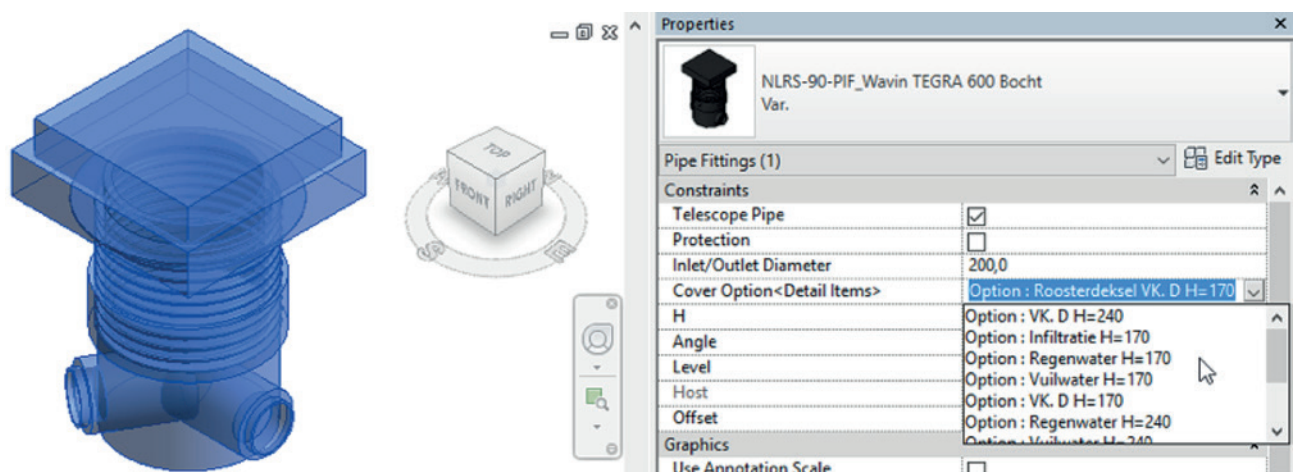


## Customisation

After a chamber is placed, user can select it and customise it under Properties Tab. Note, that some customisation options may be blocked for editing when the chamber is connected to a pipe (like angle or inlet/outlet diameter). It is then recommended to customise chambers before connecting them to a pipe system.



At this point Telescope can be added, with or without additional Protection. Inlets/Outlets Diameter and angle between them can also be chosen. Each connector allows for up to 7,5 degrees slope adjustment. Each chamber also allows to change cover type.

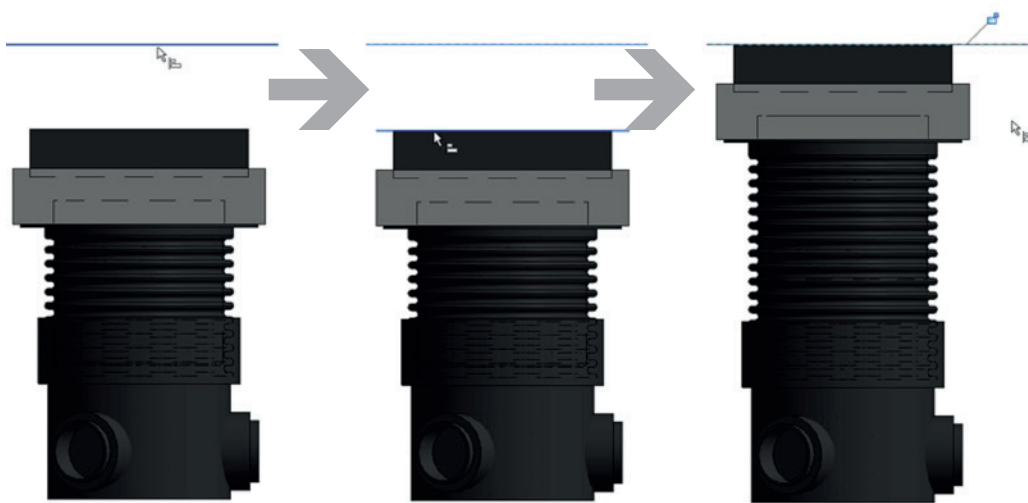




## ◉ Shaft Height

Shaft Height can be adjusted in many different ways. “H” parameter drives that dimension and can be changed, it also informs what is the distance between the top of the cover to the inside bottom wall of the chamber.

Shaft Height can also be changed by dragging the double arrow icon in section view or by aligning the cover with any desired level:

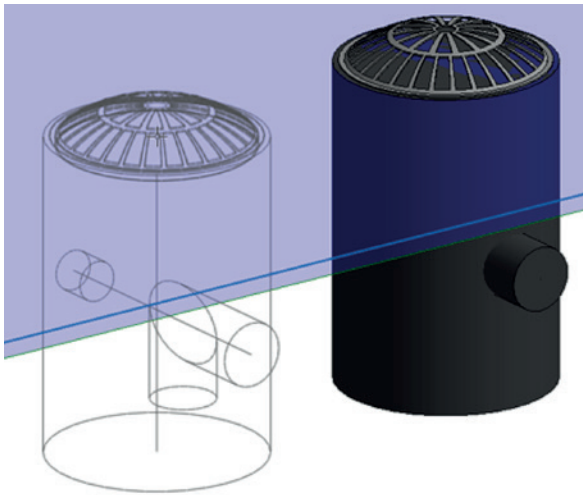


### 4.3 Wavin QuickStream Relief Chambers

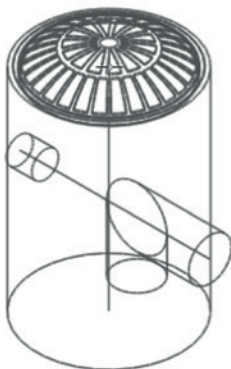
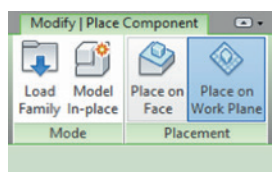
#### General information

In order to start placing these elements in the project, select “Plumbing Fixture” option from the “Systems” ribbon. Families in this package may be inserted in two ways:

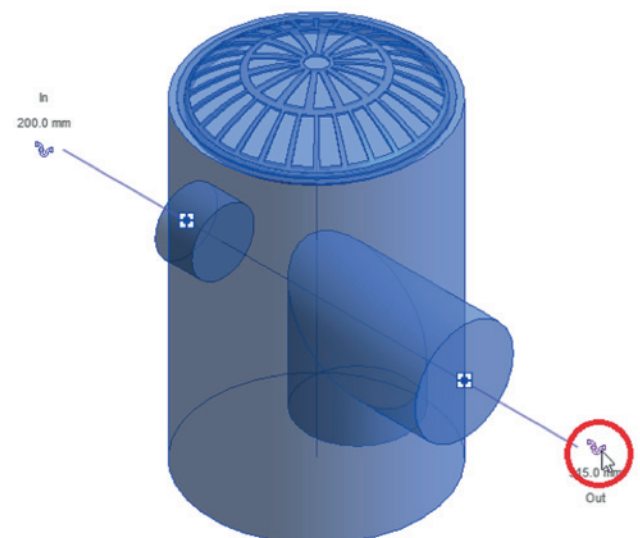
1. Placing the family onto any surface (default)



2. When there is no ground/floor surface – Change “Place on Face” into “Place on Work Plane” in the “Modify” Ribbon while the family is selected and ready to be placed.

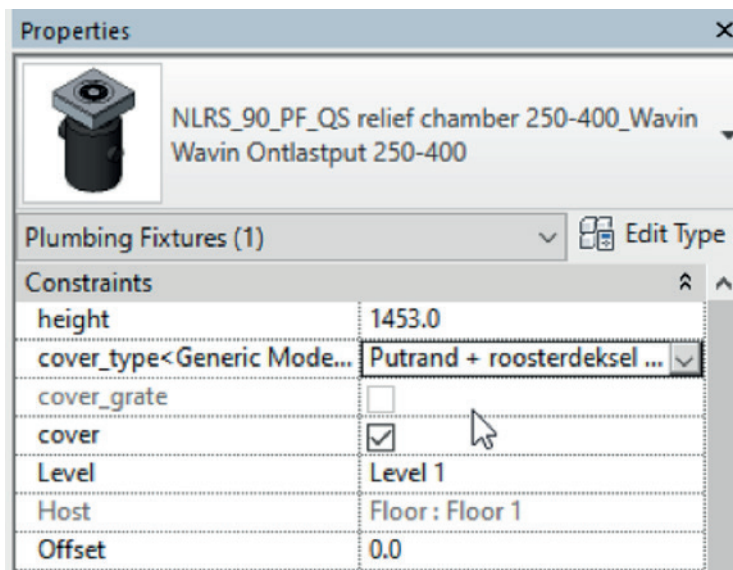


It's recommended to start a piping system out of the Relief Chambers connector, by selecting the family and then, by clicking on “Create Pipe” symbol, as seen below:



## 🔗 Cover customisation

Families allow the user to enable additional cover option, when family is selected. When cover is enabled, there is a choice of it's type in form of a drop down list.

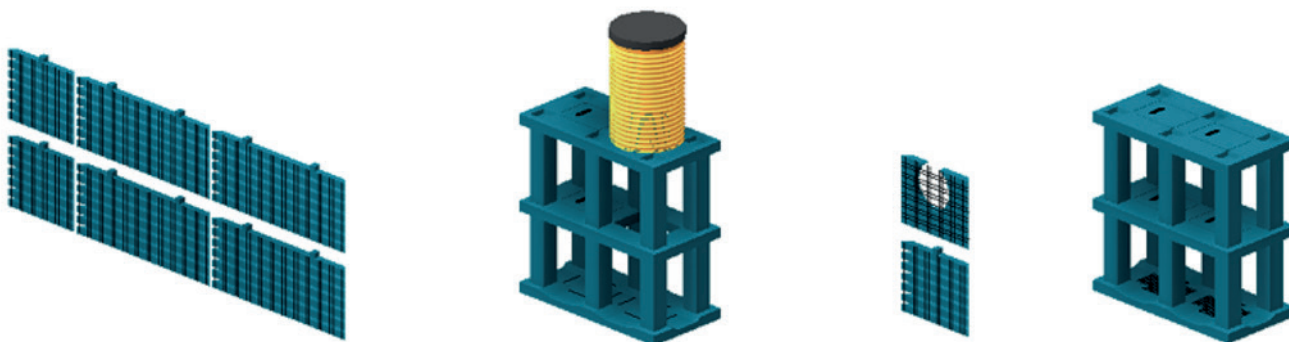


# 5. Product range specific issues - Storm Water Management

## 5.1. Q-Bic Plus

### Basic families

To build a full Q-Bic Plus tank using the package only 4 families are needed, all categorized as “Mechanical Equipment”. All other included families are nested elements and should not be used manually. The package is also equipped with a generic PVC pipe type to enable for designing tank’s inlets and outlets..



### Infiltration unit ARRAY

This family is used to build the main body of the tank. It contains the following user-modifiable shared parameters:

- Q-Bic+ Tank Name - to set the tank name and differentiate between tanks in schedules,
- No. Of Layers - to set the height of tank (between 1 and 4 layers),
- Closed Bottom Plates - to choose between heavy and light bottom plates,
- Infiltration Tank - to set the purpose of the tank, between infiltration and attenuation (it influences the geotextile & foil quantities in the tank schedule).

Validation:

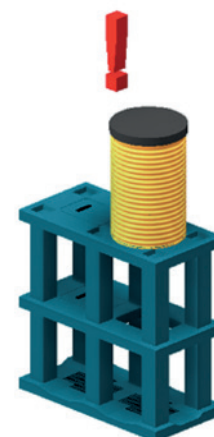
An exclamation mark will appear above the family with a text warning in the properties window if the tank is set to attenuation with light bottom plates.



### Infiltration unit ARRAY with shaft

This family is used to insert a shaft in the main body of the Q-Bic Plus tank. In addition to the same set of parameters as in the previous family it contains the following:

- Total Height - to specify the total height of the block – between the base of the bottom plate and the top of the shaft cover (terrain level). If the shaft pipe length resulting from the value set in this parameter is below minimal, it will result in a “can’t make type” error.
- Shaft Right - to specify if the shaft should be placed on the left or right side of the main unit.



The family comes in a few types representing a complete Wavin solution of a shaft in specific diameter, with specific capping.

Validation:

An exclamation mark will appear above the family with a text warning in the properties window if the value of “Total Height” results in invalid shaft pipe length or if the tank is set to attenuation with light bottom plates.

### ➤ Connection plate ARRAY

This family is used to enable a side connection to the tank. It contains the same set of basic user-modifiable parameters as the main unit array, in addition the following:

- connection diameter - to specify the diameter and type of connection, from a fixed list (a drop down menu),
- Connection Level - to specify on which level the connection plate should be placed
- Position - to specify how to orient the connector of connection plate: right-up, left-up, right down, left-down

Validation:

An exclamation mark will appear above the family with a text warning in the properties window if the tank is set to attenuation with light bottom plates.



### ➤ Lateral side plate ARRAY

This one is used to finalize the design of the tank by enclosing it with side plates. Among the standard set of user-modifiable parameters it contains:

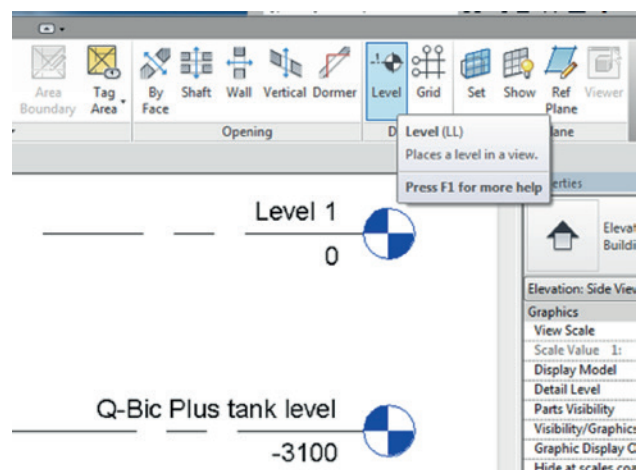
- No. Of Columns - to determine a number of full length side plates in a row,
- Extra Half Endplate - to specify if an extra half plate on the end is needed.

### ➤ Building a Q-Bic Plus tank

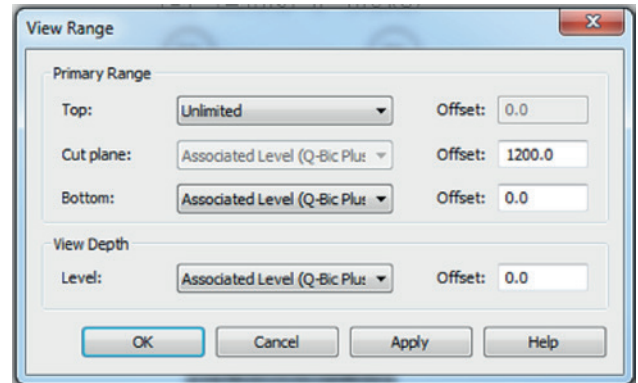
The following procedure explains how to prepare a cuboid shaped tank:

⚠ The package does not limit the tank's shape – the user can build the tank in every possible shape in a similar way.

- Creating a new level dedicated for the tank by following the steps below:
  - Make sure that the current view is a 2D section or elevation view.
  - Go to "Level" in "Architecture" ribbon
  - Place the level, and specify its elevation and name.

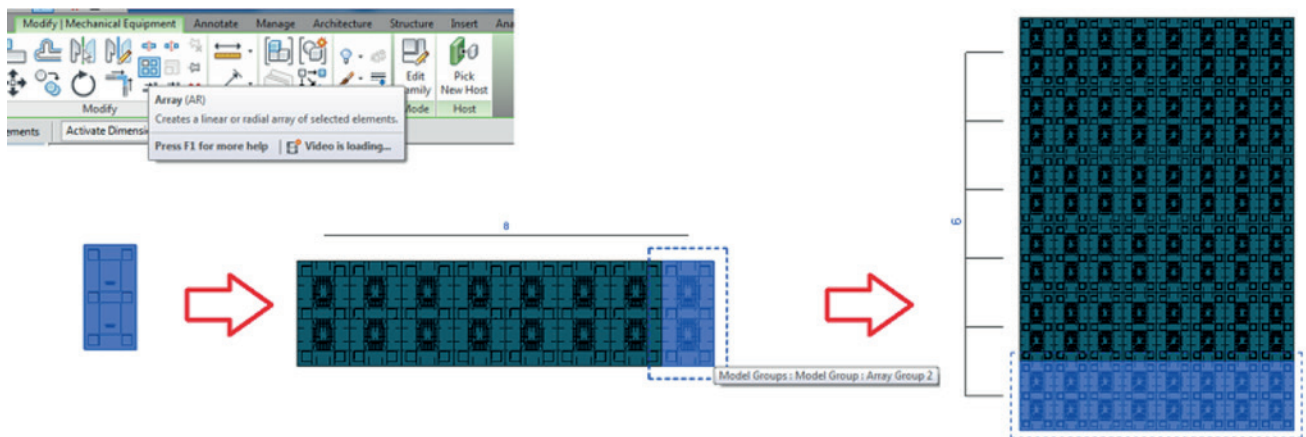


- b. Go to "Project Browser", and delete "Ceiling plan", and "Structural plan" of the new level.
- c. Go to view Properties, and set the "View Template" to "None", and in the "View Range" set the "Top Primary Range" to "Unlimited".

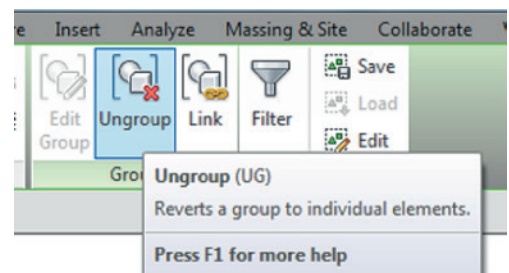


- d. Go to "Systems" ribbon, and choose "Mechanical Equipment".
- e. On the list pick the Infiltration unit ARRAY family
- f. Place a single instance where you plan the tank's corner.
- g. Rotate it if needed.
- h. Select it, on the appearing "Modify|Mechanical Equipment" Ribbon, click the "Array" button.
- i. Specify the starting point (the main unit's corner), the step, and the number of elements desired.
- j. After creating the first array, select it and repeat the steps to make the vertical array

⚠ The used steps should always be 1200 mm along, or 600 mm across the main unit).

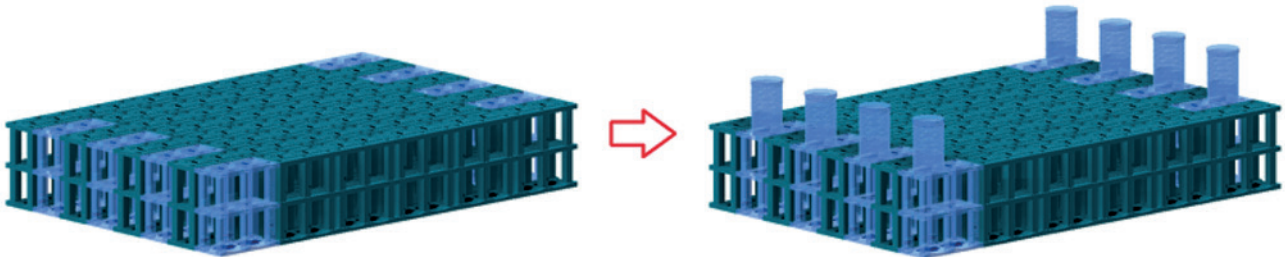


- k. After preparing a horizontal and vertical array select all units and click "Ungroup" button on the "Modify|Mechanical Equipment" ribbon.
- l. Repeat the step once more so that no element is a member of any array anymore.



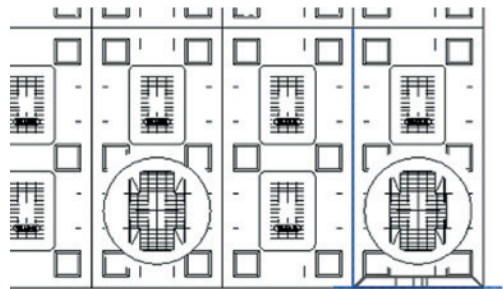


- m. Now select the families where shafts should be placed. Use multiple selection if needed.
- n. In the “Properties” tab, replace the family type with a desired “Infiltration unit ARRAY with shaft” type.
- o. Check/Uncheck “Shaft Right” to adjust the shaft alignment.



- p) In “Systems” ribbon choose the “Mechanical Equipment”, and pick the Connection plate ARRAY family
- q) Place it on the desired place in the tank.

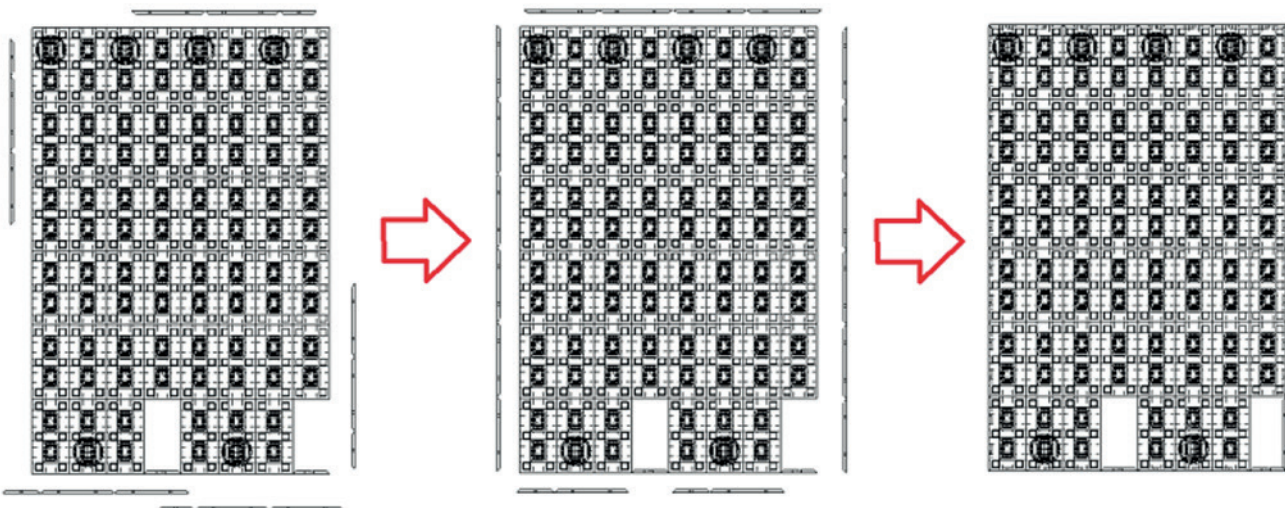
⚠ It is best to place the plates in the dedicated floor plan view with the “View Style” set to “Wireframe”, the snap points and lines of the Q-Bic Plus main units should be helpful with fitting the plate in a correct place. If this is still difficult, temporarily hide an impeding family, or create grids (“Architecture” ribbon → “Grid”) along the tank edges.



The gaps on tank’s sides should be covered by the “Lateral side plate ARRAY” families.

- r) Place the families next to the sides of the tank.
- s) Adjust the “No. Of Columns” and “Extra Half Plate” parameters and fit them in the gaps. Use the snap points and lines of the main unit families.

⚠ If that is difficult, use the grids and temporarily hide the main body of the tank.



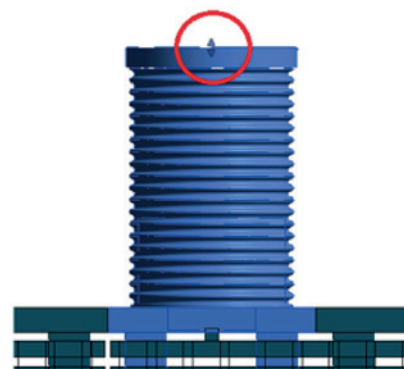
After composing the tank, it is possible to modify its parameters using the following parameters:

- Number of layers
- Bottom plate type
- Level of connectors
- Diameter of connections
- Tank destination (infiltration or attenuation)
- Tank's name.

⚠ Make sure to select the whole tank before changing the parameter values. Mind that inducing changes to a large number of elements take a reasonably longer time to process.

⚠ An exclamation mark above shaft families might appear when trying to increase the number of layers. To remove it, adjust the "Total Height" parameter so it doesn't create an invalid shaft pipe length. The height of the shafts can also be adjusted dynamically with a shape handle – visible in a 2d side view (section or elevation).

It is also easy to adjust its elevation. Simply go to a 2d side view (section or elevation) and adjust the dedicated tanks level.




## 🔍 The Schedules

Every schedule separates the quantities of the materials per each tank, sorting by its name. If any Q Bic Plus family was left unnamed, the corresponding materials will not be assigned to specific tank in the schedule.

There are three schedules in the package:

- Geotextile, Foil and Volume schedule: Includes the net surface of tanks, quantity of geotextile [m<sup>2</sup> & m of roll], foil [m<sup>2</sup>], net and gross volume of tanks.
- Shafts: Includes the bill of material of the shaft elements – covers, shaft pipes, gaskets etc.,
- Tank Elements: Includes the bill of material of the Q-Bic Plus elements like main units, bottom plates, connection plates, shaft connector kits etc.

<div style="text-align: center;">  <p>&lt;Q-Bic Plus - Tank Elements&gt;</p> </div>		
A	B	C
Count	Article Nr.	Product description
<b>Tank A</b>		
120	2439900001	Q-Bic Plus Buffer Bodemplaat
67	2456600003	Q-Bic Plus Zijplaat 1200x600
4	2456640160	Q-Bic Plus Aansluitplaat 160-400
2	2456660000	Q-Bic Plus PE Schachtaansluiting 600
240	2459900000	Q-Bic Plus Infiltratie Unit 1200x600x600
<b>Tank B</b>		
100	2439900001	Q-Bic Plus Buffer Bodemplaat
58	2456600003	Q-Bic Plus Zijplaat 1200x600
2	2456640160	Q-Bic Plus Aansluitplaat 160-400
2	2456660000	Q-Bic Plus PE Schachtaansluiting 600
200	2459900000	Q-Bic Plus Infiltratie Unit 1200x600x600

- ⚠ The number of side plates visible in the Tank Elements schedule is always a full number, so whenever in the 3d model there is a half plate used, the schedule always adds up to full plates, if there is uneven number of halves, the value is rounded up to full length plates.

Consider the below project situation:

Although it seems like a lot of plate halves need to be used on this side, in the real life scenario only one full plate will need to be cut to halves. The remaining plates will be used uncut, in one piece. The model layout results directly from the use of separate arrays to build the side of the tank and should not be treated as a design requirement.

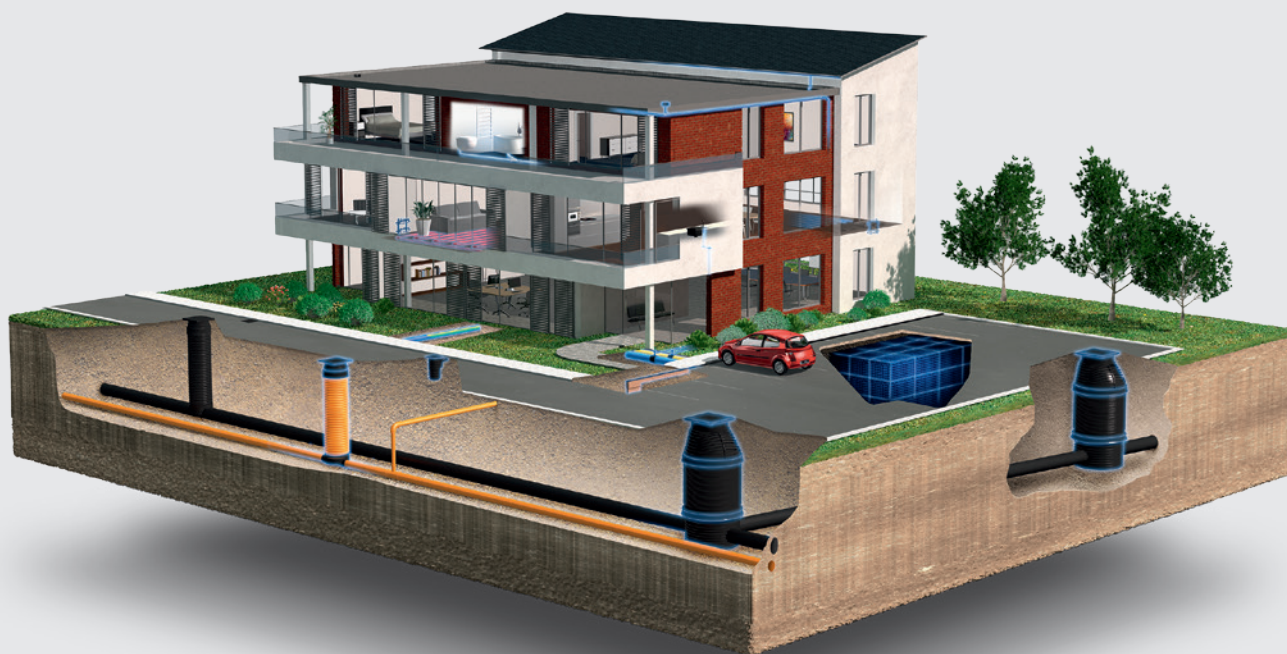


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