Allplan 2014
Step by Step

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Fit for CAD Engineering

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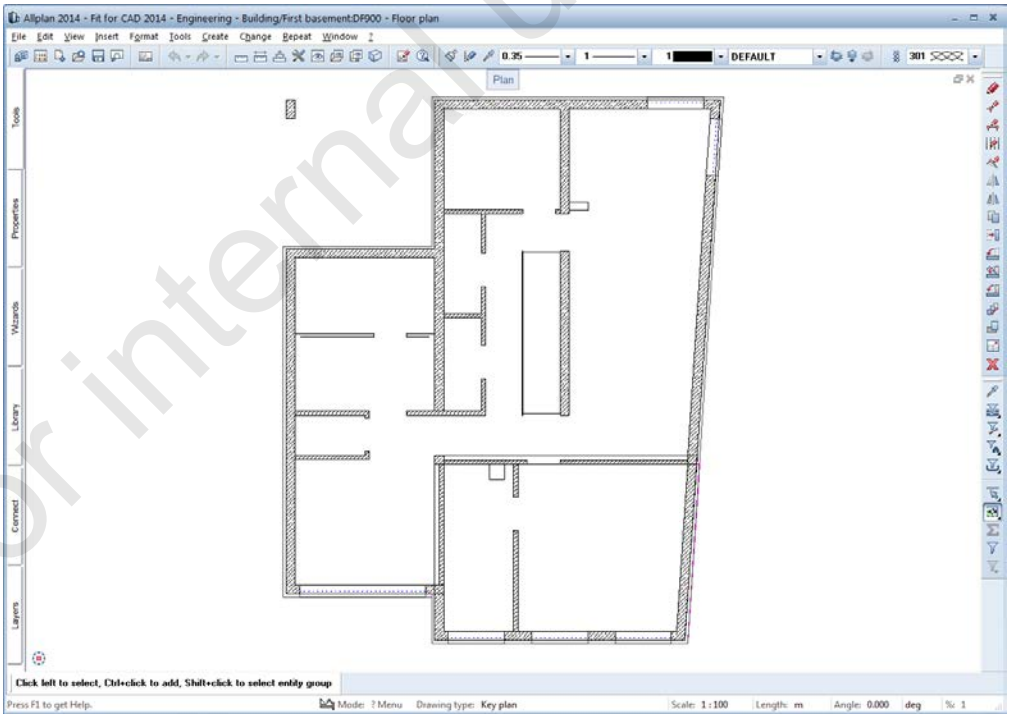
Exercise 1: basis for reinforcement

To create the key plan and the slab reinforcement of the basement as well as the slab reinforcement of the ground floor, you will import the architectural data, which will serve as the basis for your work. You will assign additional drawing files for the reinforcement drawings in the building structure.

Before you start reinforcing the bottom layer, you need to make basic layer settings, customize the toolbars, check the reinforcement standard and reinforcement mode and create your own wizard.



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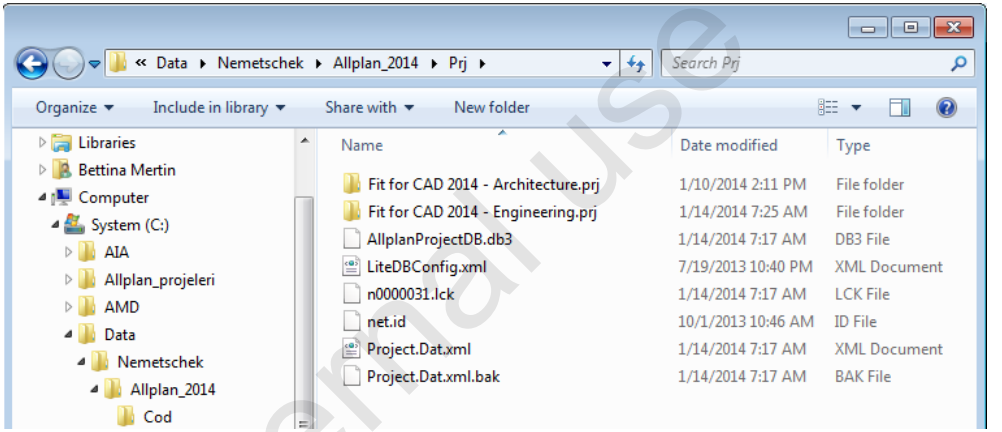
Task 1: importing project backup

Overview

Specify the backup path in the Services application and import the project data from the ”Fit for CAD” CD to a new project.

You can find detailed information on how to import project data from CD/DVD in the section ”A note on importing project data” at the end of Fit for CAD Basics.



Use the following tool(s) to do this:

Function	How to activate it
Services application	Icon in Quick Launch bar or in the **Nemetschek Allplan** group
Backup path	**Configuration** menu in the Services application
Import - Projects	**Data Backup** menu in the Services application

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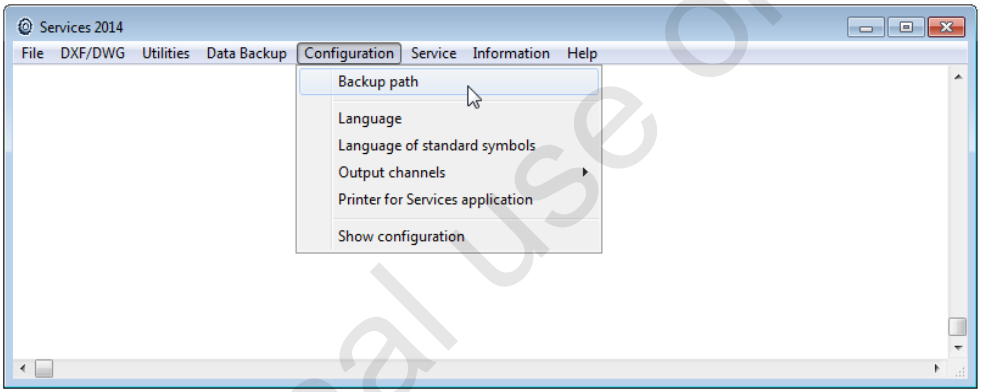
Solution

To import project data

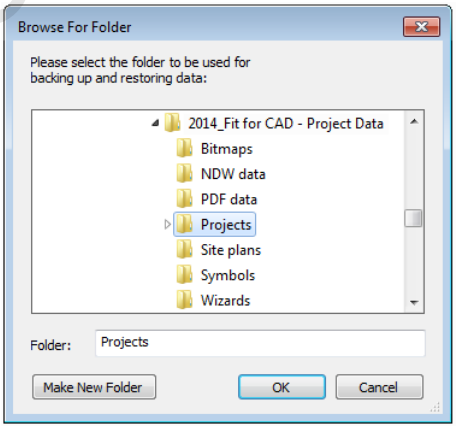
1 Start the **Services** application.

2 Insert the ”Fit for CAD” CD/DVD in the corresponding drive of your computer.

3 On the **Configuration** menu, click **Backup path**.



4 The **Browse for Folder** dialog box opens. Select the CD/DVD drive and then the **Projects** folder.



5 Click **OK** to confirm.

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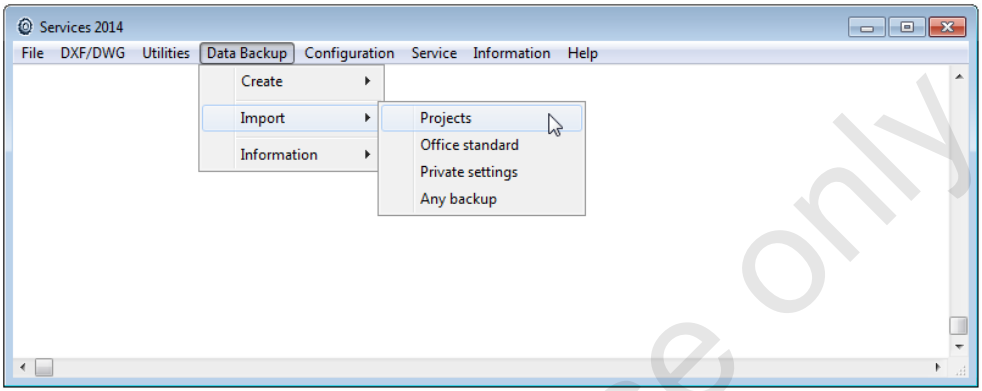
6 On the **Data Backup** menu, point to **Import** and then click **Projects**.

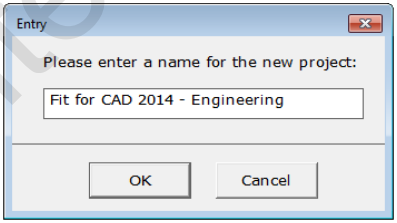


7 The **Select** dialog box opens. Choose the **Fit for CAD 2014 - Basics** project and click **OK** to confirm.

8 Click **Yes** at the following prompt asking whether you want to import all the data.

9 Allplan displays another prompt. Here, too, click **Yes** in order to create a new project and import the data there.

10 Enter a name for the new project and click **OK** to confirm.



The data is extracted to the new project and checked.

11 Click **OK** to confirm the **Finished** dialog box and exit the Services application.

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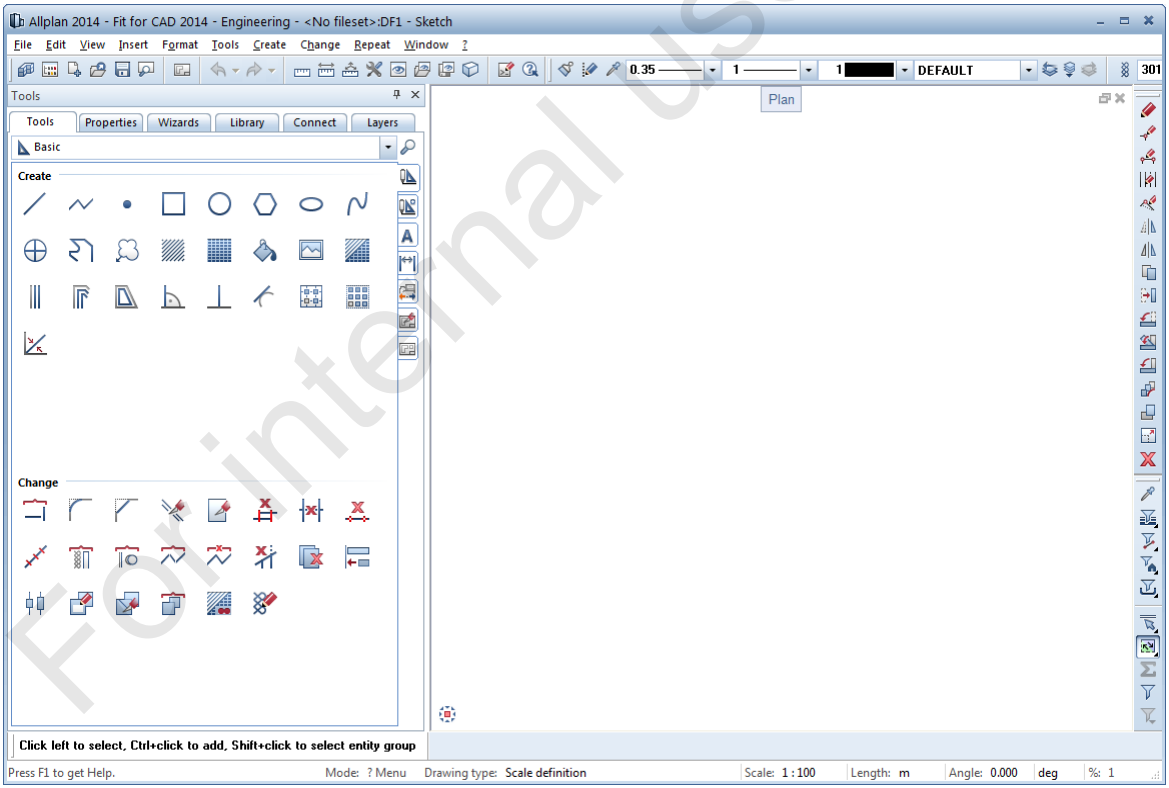
Task 2: starting Allplan and loading the project

Overview

When you create a project in Allplan or ProjectPilot, this new project opens automatically.
But when you use the Services application to create a project and start Allplan afterwards, the empty project or the last project you selected is open (provided you have switched off the Welcome screen). In this case, you need to select the new project manually.



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Use the following tool(s) to do this:

Function	How to activate it
Allplan	Icon in Quick Launch bar or in the **Nemetschek Allplan** group
Open Project	Welcome screen

Solution

To start Allplan and load the project

1 Open the Windows start menu and point to **All programs**, **Nemetschek**, **Allplan 2014** and click **Allplan 2014**.

2 After having started Allplan 2014, you can open the new project straight form the Welcome screen. Click the corresponding tool.

If you have switched off the Welcome screen, click **New Project**, **Open Project** on the **Default** toolbar.

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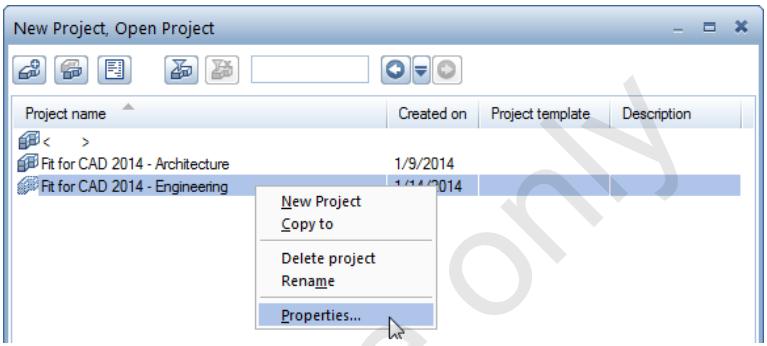
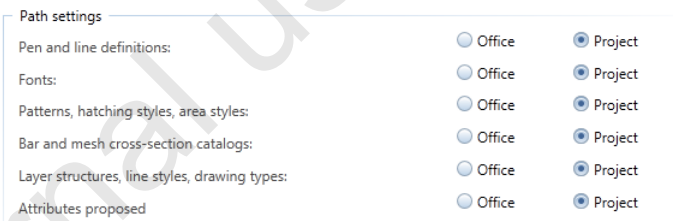
3 Click the new project with the right mouse button and choose **Properties** on the shortcut menu.



4 Check that all the path settings are set to **Project**.



5 Click **OK** to confirm both dialog boxes.

Allplan opens and the **palette configuration** is active.

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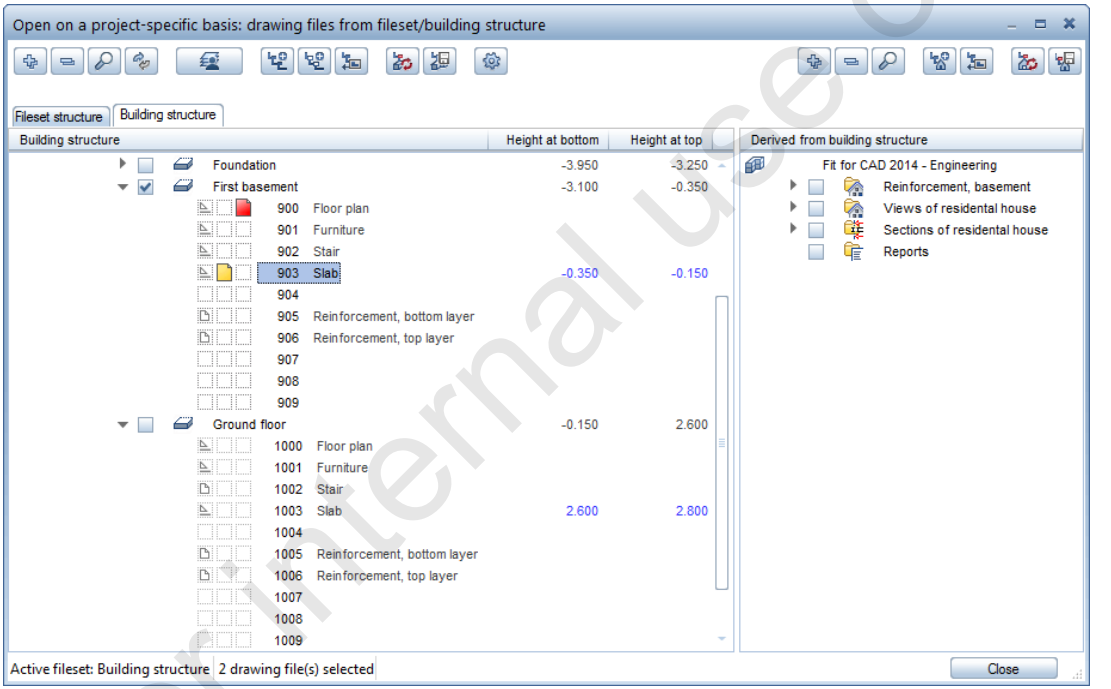
Task 3: assigning reinforcement drawing files

Overview

Assign additional drawing files to the **1. Basement** and **Ground floor** structural levels for the reinforcement.



Use the following tools to do this:

Tool	How to activate it
Open on a Project-Specific Basis	**Standard** toolbar or double-click the left mouse button
Assign drawing files	**Open on a project-specific basis: drawing files from fileset/building structure** dialog box

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Solution

To assign drawing files

1 Click **Open on a Project-Specific Basis** (**Default** toolbar) or double-click in the workspace with the left mouse button.

2 Open the **Building structure** tab and close the structural levels of the stories by clicking the arrow to the left of each story.
Or:
Click **Collapse all entries** at top left and open the **Building** structural level.

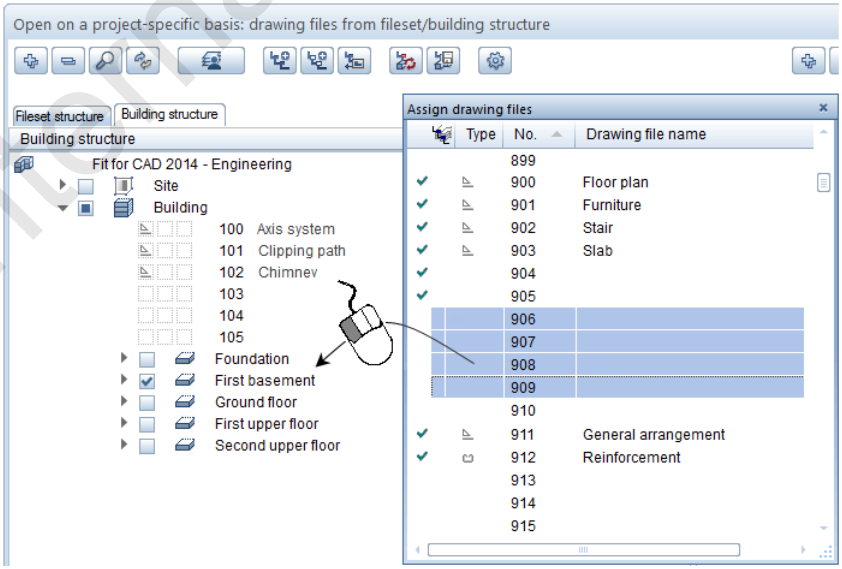
3 Select **Assign drawing files** at the top, click drawing file **906**, press and hold down the SHIFT key and click drawing file **909**.

This selects drawing files 906 to 909.

4 Click within the selection, keep the mouse button pressed down and drag the drawing files to the **First basement** structural level. Then release the mouse button again.

Tip: Press the **CTRL key** to select a series of non-adjacent drawing files

Press the **SHIFT key** to select a range of adjacent drawing files.
Or open a selection rectangle around selected drawing files with the mouse.



The drawing file tree for this structural level opens. Now you have assigned the drawing files to this structural level.

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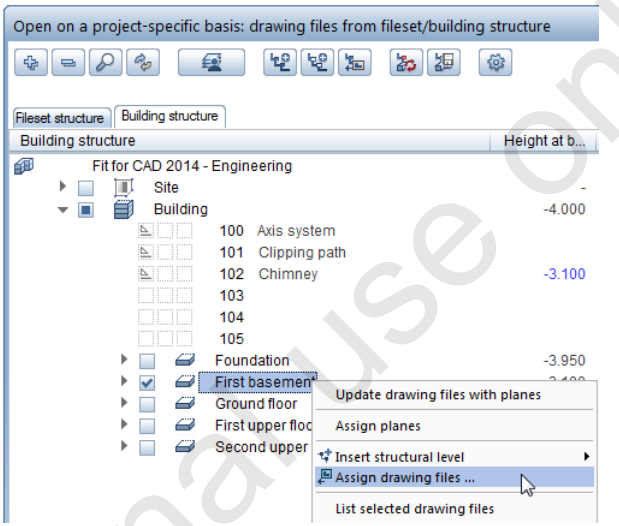
If you have selected a drawing file too many, you can drag it out of the structural level in the same way.

Note: Instead of using drag-and-drop operations, you can also select the required structural level, open the shortcut menu and choose **Assign drawing files...**.



5 Name the new drawing files as follows:

Drawing file 905 **Reinforcement, bottom layer**
Drawing file 906 **Reinforcement, top layer**

Tip: By using the layer structure, you can create the entire slab reinforcement in a single drawing file.

6 Use the same approach to assign drawing files 1006 to 1009 to the **Ground floor** structural level and name the drawing files as follows:

Drawing file 1005 **Reinforcement, bottom layer**
Drawing file 1006 **Reinforcement, top layer**

7 Open and activate the **First basement** structural level, make drawing file **900 Floor plan** current and open drawing file **903 Slab** in edit mode.
Close the dialog box.

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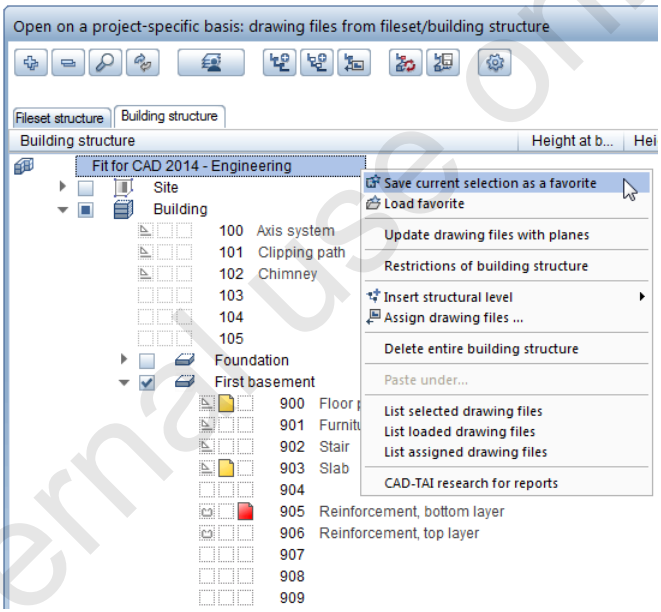
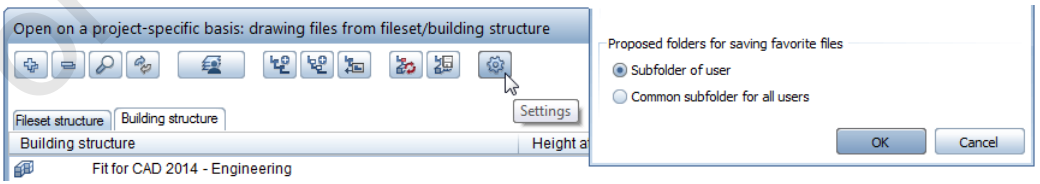
A note on saving the current settings as a favorite file

Using the fileset structure, you only need to select a fileset and all the associated drawing files are immediately at hand. To achieve the same result with the building structure, you can save the drawing file settings you have made for the individual structural levels as a favorite file using the shortcut menu. This way, you can retrieve the settings at any time.



Click  **Adjust** to specify the folder Allplan proposes when it comes to saving these favorite files.



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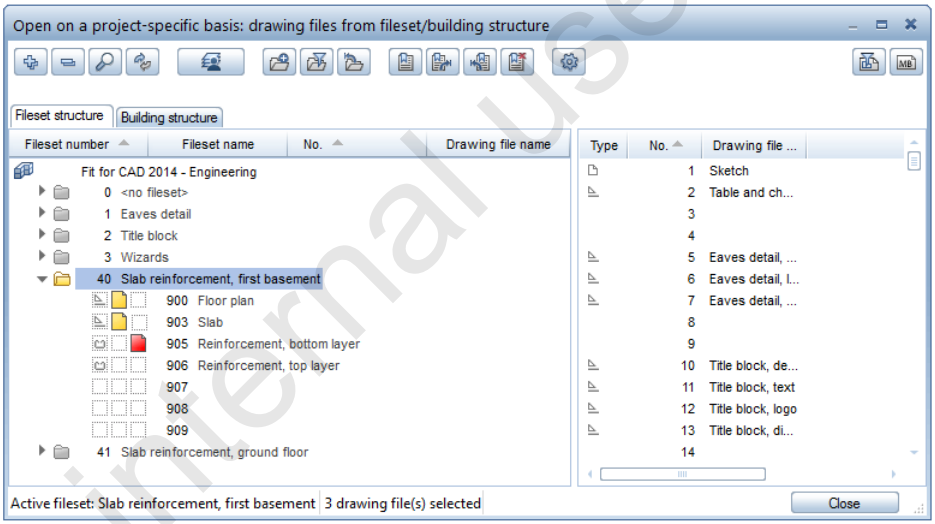
A note on the building structure in reinforcement design

The building structure and fileset structure can be used concurrently. You can set the status of a drawing file both in the fileset structure and in the drawing file structure. The settings are entirely independent of one another. Allplan opens the drawing files in accordance with the tab that is active when you close the dialog box.

Important difference: in the building structure, you can assign a drawing file to a structural level only once whereas in the fileset structure you can assign a drawing file to as many filesets as you want.
In addition, when working with the fileset structure, you can place detailing windows in filesets or assemble layouts using filesets.



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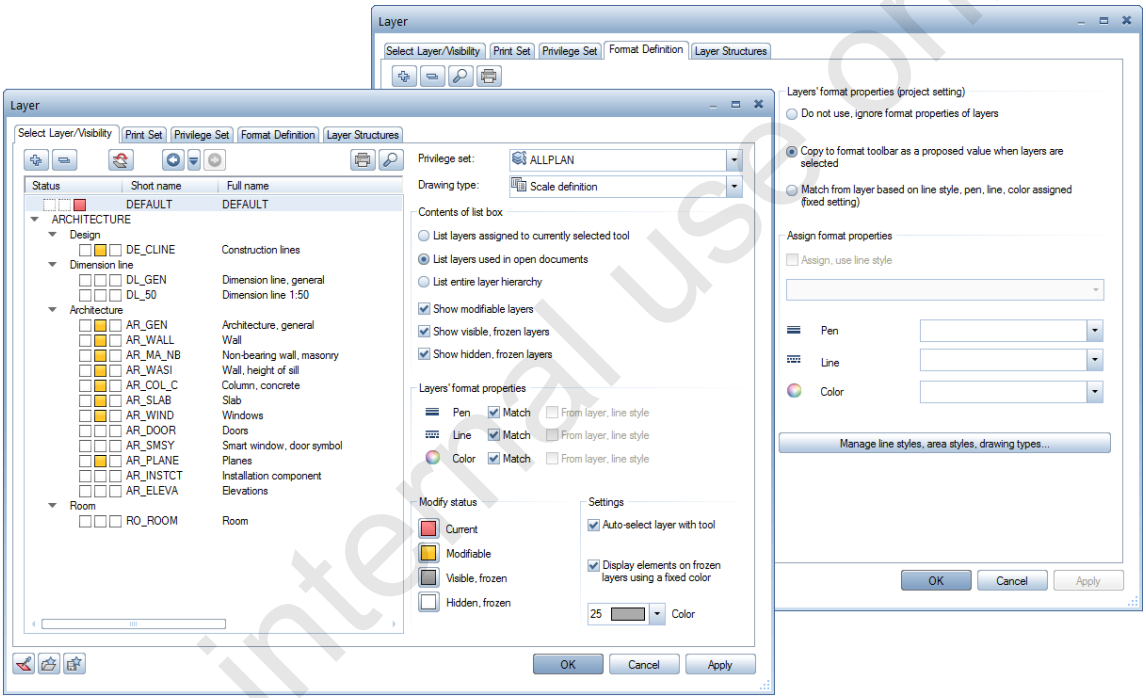
Task 4: basic layer settings

Overview

The format properties specified in the options are used for the reinforcement.



Use the following tool(s) to do this:

Function	How to activate it
Select, Set Layers	**Format** menu or double-click the right mouse button
Options	**Default** toolbar
Show/Hide	**Default** toolbar

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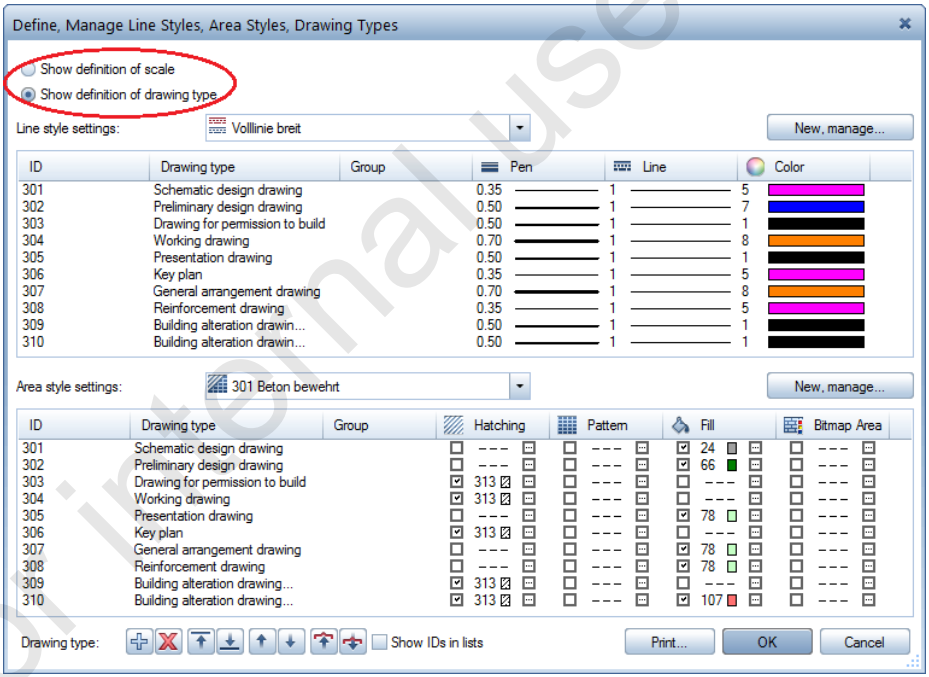
Solution

To select layers

1 Click **Select, Set Layers** (**Format** menu) or double-click in the workspace with the right mouse button.

2 Select the layers as described below:

- Open the **Format Definition** tab and select the second option in the **Layers' format properties** area.
- Click the **Manage line styles, area styles, drawing types...** button and check the setting.



- Open the **Select Layer/Visibility** tab and make sure that the **Auto-select layer with tool** check box is selected.
- Select all the check boxes in the **Layers' format properties** area.

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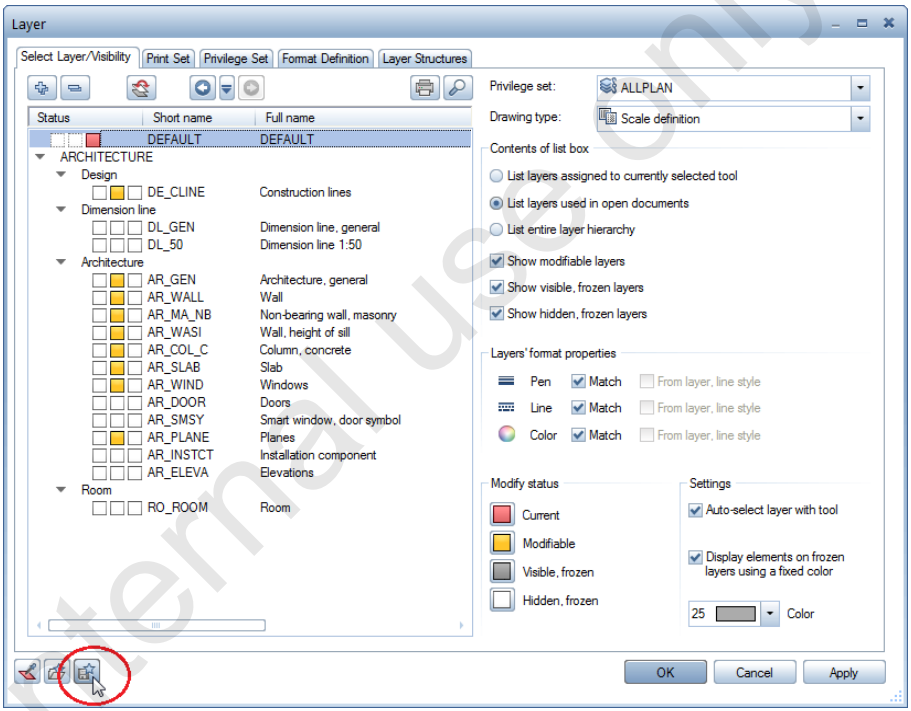
3 Select the **List existing layers in open documents** option and set the layers **AR_GEN**, **AR_SMSY**, **AR_INSTCT**, **AR_LABEL**, **AR_ELEVA**, **RO_ROOM** and **RO_VERSU** to **Hidden, frozen** using the shortcut menu.

4 Save these layer settings as a favorite file. Click **Save as a favorite** at bottom left.



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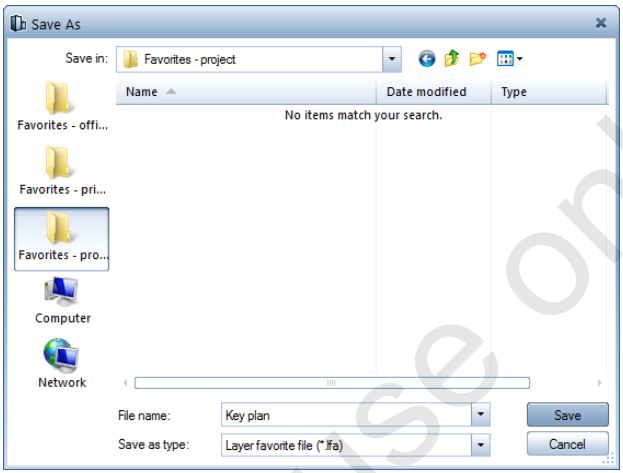
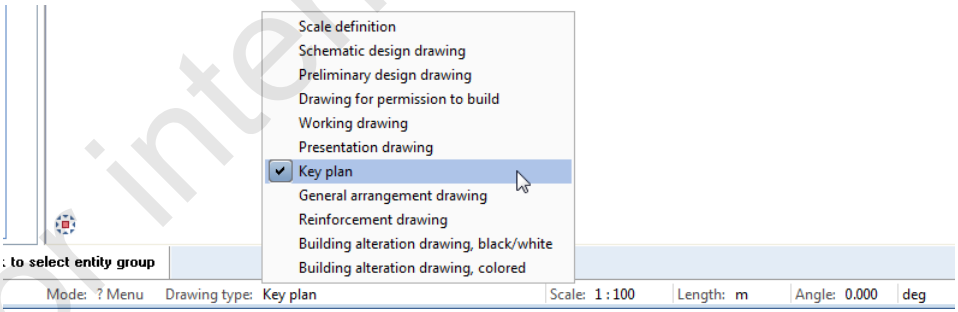
5 Enter "Key plan" for the name of the favorite file and save it in the project.



6 Click **OK** to confirm the dialog box.

7 Select the **Key plan** drawing type in the status bar and check the reference scale (**1:100**), unit of length (**m**), system angle (**0.00**) and unit of angle (**deg**).



8 Click **Options** (**Default** toolbar) and open the **Mouse and crosshairs** page.

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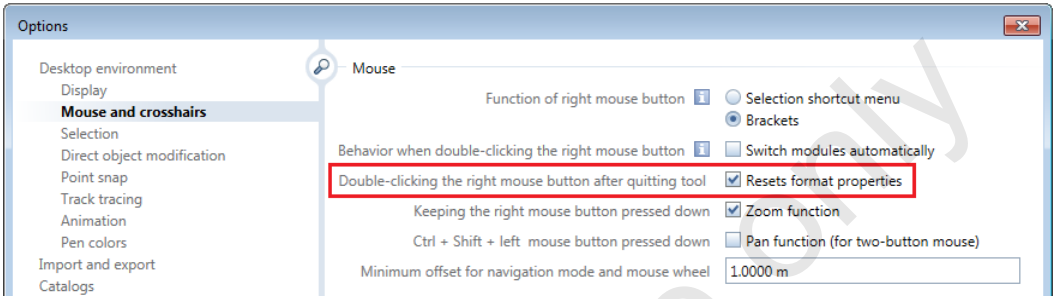
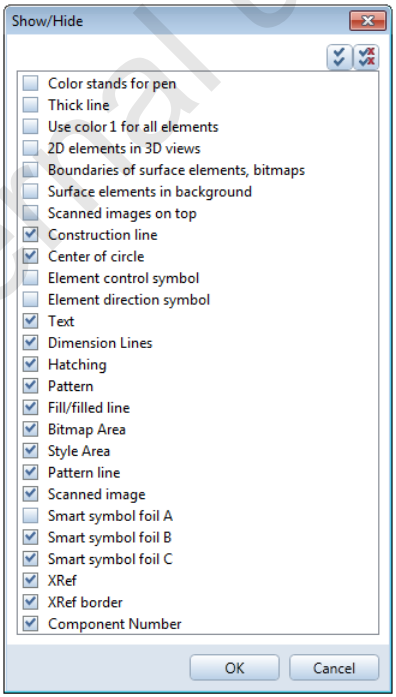
9 If you want, you can select the **Double-clicking the right mouse button after quitting tool resets format properties** option in the **Mouse** area



10 Click **OK** to quit the options.

11 Click **Show/Hide** (**Default** toolbar) and check the settings.



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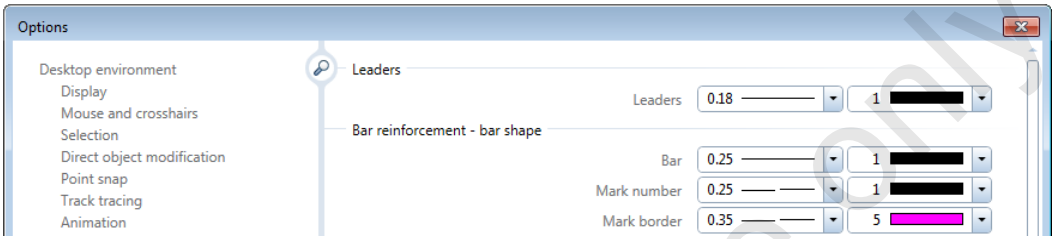
A note on matching the reinforcement's format properties from layers

The reinforcement modules' **Options** (**Default** toolbar) provide a number of settings you can use to specify how bar, mesh and BAMTEC reinforcement is displayed.



When you create reinforcement, Allplan uses these format properties, regardless of the current settings on the **Format** toolbar. You can also modify these settings later using the **Modify Format Properties** tool.
The settings you make in the options have priority even when you select the second option in the **Layers' format properties** area on the **Format Definition** tab and select the check box(es) for the format properties on the **Select Layer/Visibility** tab.

Only when you select the third option (**Layers' format properties** area on the **Format Definition** tab) and select the check box(es) for the format properties on the **Select Layer/Visibility** tab will Allplan use the layer or line style settings.
In this case, you cannot modify the format properties when you create reinforcement (on the **Format** toolbar) or later (using the **Modify Format Properties** tool).

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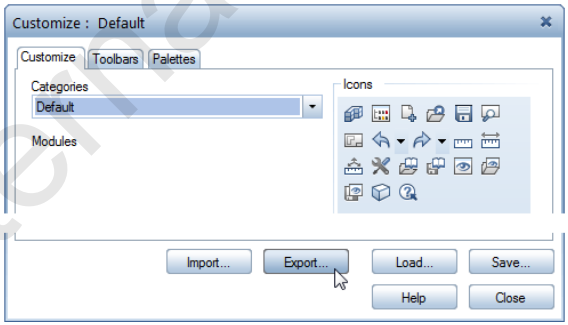
Task 5: customizing toolbars

Engineering configuration

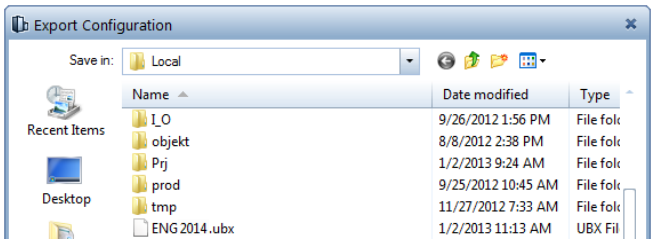
Until now you have been working with the **palette configuration** and you have selected the tools you need by selecting the relevant family and module in the **Tools** palette.
So that you can access tools of different families and modules without having to select them in the **Tools** palette first, you will open the **Engineering** toolbar in addition to the other toolbars. This toolbar includes the tools from the bar reinforcement, mesh reinforcement and BAMTEC modules on flyouts.

To ensure that the maximum amount of space is available to you on screen, set the palettes so that they hide automatically.

Clicking **Customize...** on the **Tools** menu opens the **Customize:** dialog box, where you can save the toolbars' position and buttons. Click **Export...** near the bottom of the dialog box.



Allplan proposes saving the `*.ubx` file in the user folder (`...\Usr\Local`).



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Note: You can use **Load...** to switch between the configurations. Carrying out the **toolbar** hotline tool in the Services application restores the default configuration and removes the other configurations.

To customize toolbars

1 Select the **Engineering** family in the **Tools** palette and open the **Key Plan** module.

2 Click in the title bar of a palette.

The palettes are hidden. They open automatically when you move the cursor over them.

Tip: If you do not want to hide the palettes automatically, click in the title bar of a palette.

3 Open the **Engineering** toolbar, which you will use to select tools in the exercises that follow.
Click the status bar with the right mouse button and click **Engineering** on the shortcut menu.

4 Click the title bar of the **Engineering** toolbar, do not release the mouse button and drag the toolbar to the top right so that it is positioned next to the **Edit** toolbar.

Tip: As the exercises in this guide make constant reference to the flyouts, we advise bookmarking or making a copy of this page.

Bar Entry and Placement flyout
Area Reinforcement flyout
Mesh Entry and Placement flyout
BAMTEC flyout
Display flyout
Engineering Modify flyout
Reports flyout

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Track tracing

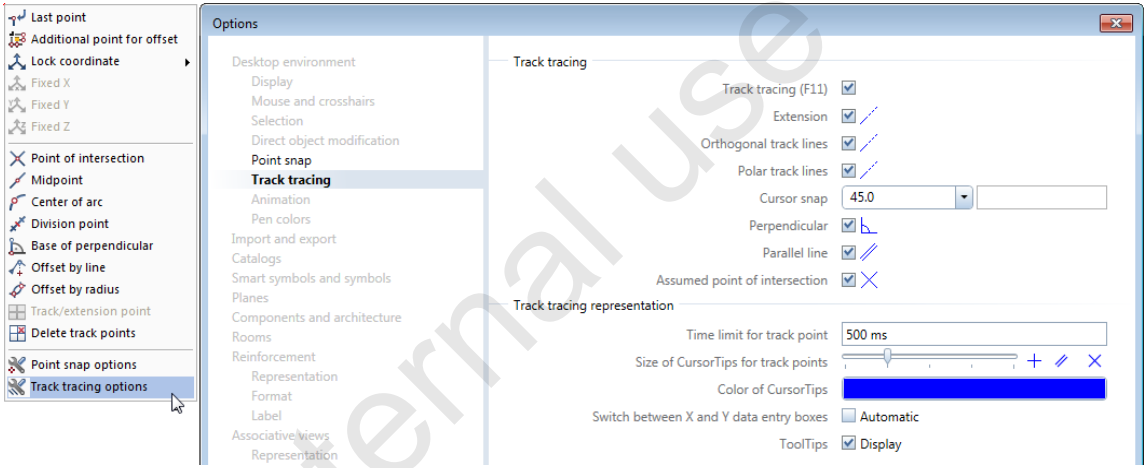
Track tracing facilitates the intuitive design process. It is active by default.

To make settings for track tracing

1 Click Line (**Create** menu - **Draft** module).

2 Click in the workspace with the right mouse button and select **Track tracing options** on the shortcut menu.

3 Make the required settings.



Note: You can quickly enable and disable track tracing at any time while entering points by pressing the **F11** key or clicking in the dialog line.

4 Click **OK** to confirm the settings and press ESC to quit the tool.

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Task 6: reinforcement standard and reinforcement mode

The reinforcement will be created with a 3D reinforcement model in compliance with DIN EN. You can use the reinforcement options to make these settings, which apply to all reinforcement types across modules.

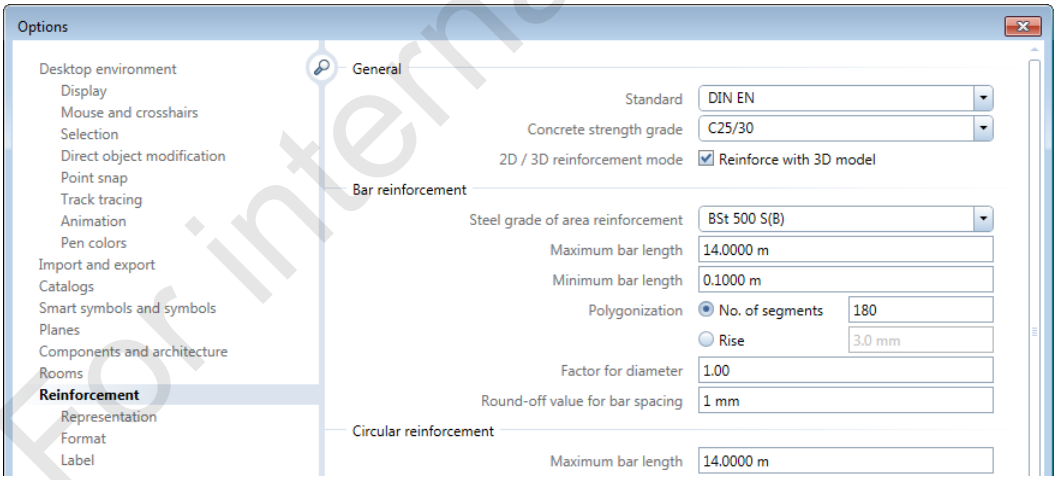
To check the reinforcement standard and mode

1 Click **Options** (**Default** toolbar) and select the **Reinforcement** page.

2 Check that the standard is set to **DIN EN** in the **General** area. If it isn't, click the button beside **Standard** and select **DIN EN**.

Select **C25/30** for the concrete strength grade.

3 In addition, check that the **Reinforce with 3D model** option is selected.



4 Click **OK** to quit the options.

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Task 7: creating wizards

Introduction

A wizard is a window that is displayed in the **Wizards** palette and that includes a pictogram-like legend representing frequently used tools. Using wizards you can work with predefined content. You can match all attributes and parameters of elements from the wizard. You do not need to define any element properties.

Clicking an element with the right mouse button opens a shortcut menu with the following options:

- The tool that was used to create the element is displayed at the top of the shortcut menu. Allplan draws the element using the most recent properties; the parameters and attributes are **not** taken from the wizard.
- **Match** opens the tool that was used to create the element **and** takes all the parameters and attributes from the wizard. This is equivalent to double-clicking the element with the right mouse button.
  This option is not available for most engineering tools as matching parameters and attributes is usually not useful here.
- **Conversion for Building Alteration Work** is presented for most architectural elements. This matches the building alteration category set for the element clicked. If you have not assigned a building alteration category, **new building** is used automatically.

Allplan comes with several predefined wizard files. You can also create your own wizards or purchase wizards with content.
The predefined wizards are in the **Assistent** folder (`\etc\Assistent`).

You can save wizards as NDW files or drawing files by clicking in the wizard window with the right mouse button and then selecting the tool you require. You can save drawing files and NDW files as wizards by clicking **Save copy as** on the **File** menu and setting the file type to **Wizard (*.nas)**.

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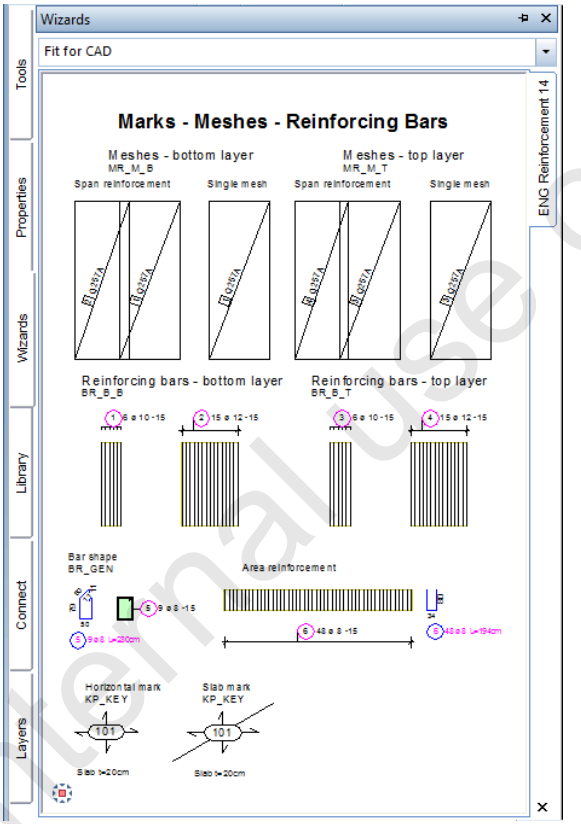
Overview

Create a wizard from the reinforcement drawing file provided and open this wizard in a new group.



Use the following tools to do this:

Tool	How to activate it
Open on a Project-Specific Basis	**Standard** toolbar
Save Copy As	**File** menu

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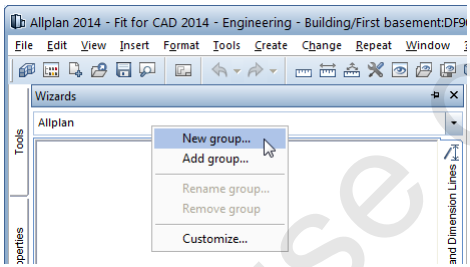
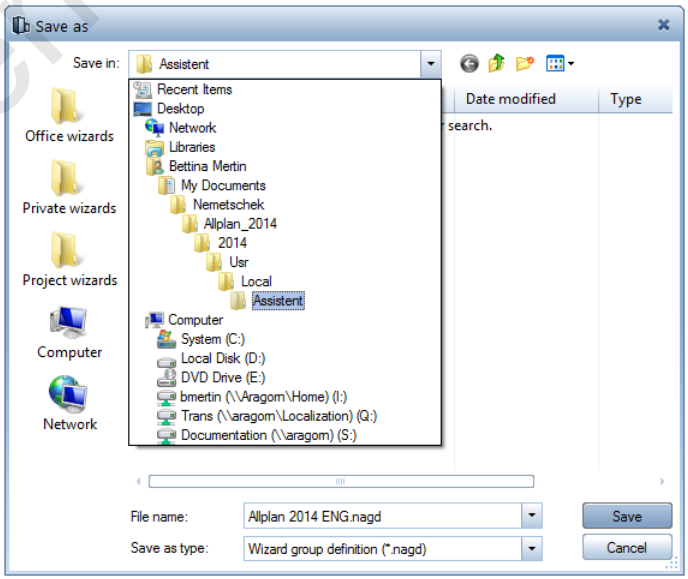
Solution

To create your own wizard

1 Open the **Wizards** palette, click in the list box at the top with the right mouse button and select **New group...** on the shortcut menu.



2 Specify the folder where you want to save the new wizard group and enter a name for the new group:
Create the new **Wizards** subfolder in the folder of the **Fit for CAD 2014 - Engineering** project. Enter **Allplan2014 ENG** for the name of the group and click **Save**.



For internal use only

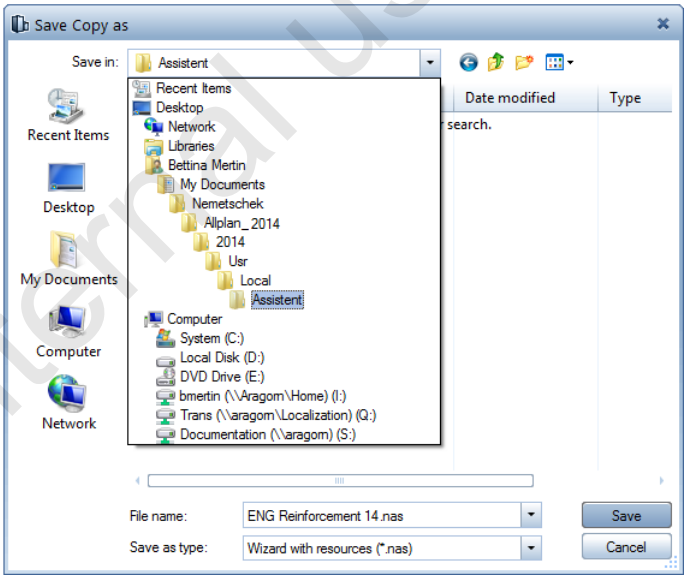
Note: You cannot save new wizard groups in the `\Etc\Assistent` folder.

3 Click **Open on a Project-Specific Basis** and switch to the **Fileset structure**.

4 Open the **Wizards** fileset and double-click drawing file 34 (**ENG reinforcement 14**).

The reinforcement elements in this drawing file have already been prepared and placed on the correct layers.
Now you will save these elements as a wizard and use them in the exercises that follow.

5 On the **File** menu, click **Save Copy as**, set the file type to **Wizard (*.nas)** and save the data in the same folder as the group file you just created.



6 Open the **Wizards** palette again, click in the empty white space with the right mouse button. On the shortcut menu that appears click **Open Wizard...** and select the wizard you just saved.

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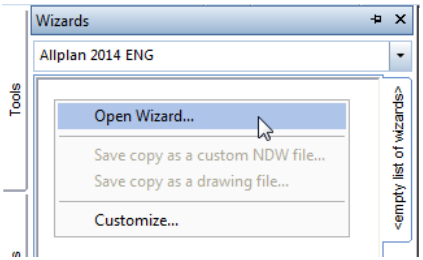
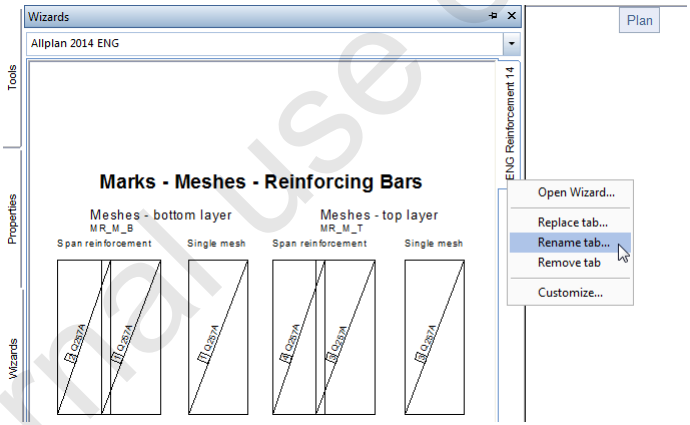


Note: You can use the shortcut menu to rename the wizard at any time.



7 Click  **Open on a project-specific basis** and switch back to the **Building structure**. Double-click in the workspace with the middle mouse button to display the entire drawing.

A note on saving wizards

Here, you saved the group and the wizard in the project. However, you should choose a different folder for daily work. For example, you can use the office folder (`\Std`), which is in the central file storage folder (for stand-alone installations).

In a network environment you can find this folder on the server.

You can display the path to these folders using the Services application:
Service - Hotline Tools - showcfg.

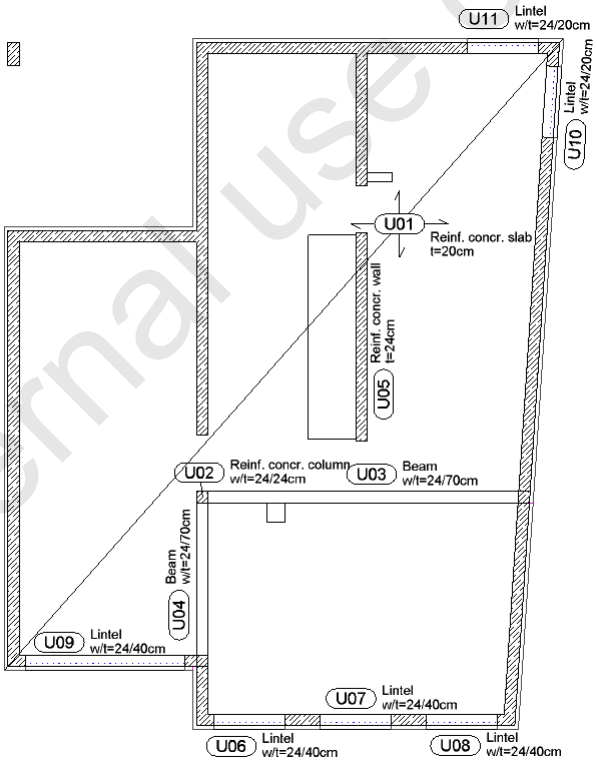
For internal use only

For internal use only

Exercise 2: key plan

You can use the tools in the **Key Plan** module to create and modify key plans in an easy and comfortable manner.

The marks most commonly used in practice are provided in these tools. You only have to select, place and label them. You can output the marks and the associated additional text in the form of a list.



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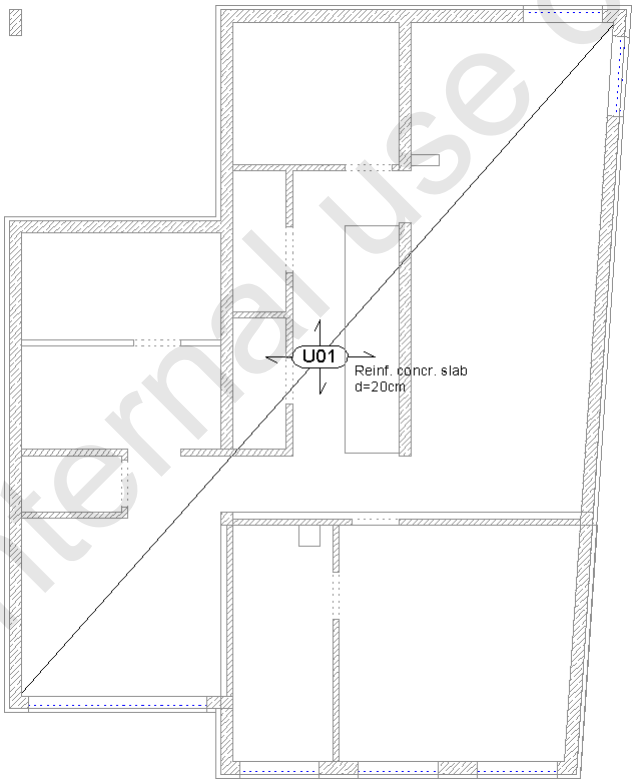
Task 1: creating a slab mark

Overview

When it comes to assigning mark numbers to slabs, you can choose between two options. You can create horizontal slab marks or aligned slab marks that reflect the angle of the slab diagonal. Here, you will create a horizontal mark.



Use the following tools to do this:

Tool	How to activate it
Slab Mark	**Tools** palette, **Create** area
Select, Set Layers	**Format** toolbar

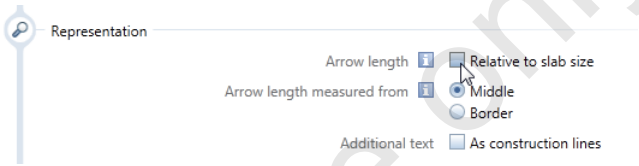
For internal use only

Solution

To create slab marks

1 Click **Options** (**Default** toolbar) and select the **Key plan** page.

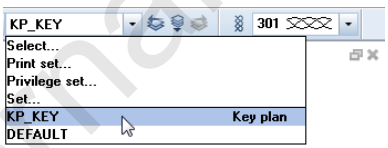
2 Deactivate the **Arrow length relative to slab size** setting and click **OK** to confirm.



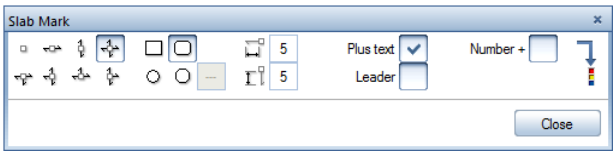
3 Open the **Tools** palette and click **Slab Mark** in the **Create** area.

4 Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **KP_KEY**.

Important: always place marks on a separate layer or drawing file!

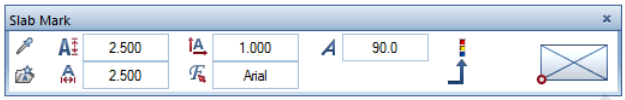


5 On the **Slab Mark** Context toolbar, select **Direction of load on all sides** and **Oval**. In addition, activate **Plus Text** to add text that will appear with the mark text.
Allplan always creates the arrow length at a minimum distance of 5 mm to the mark box, regardless of the settings in the options.



For internal use only

6 Click  to make settings for the mark text.

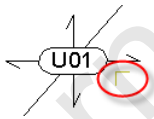


7 Set the parameters as shown above.

8 Enter **B01** in the dialog line and press ENTER to confirm.

9 Click the bottom right corner of the slab span to define the *Start point* and the top right corner to specify the *Diagonal point*.

The mark is displayed. Now you can place additional text, which can consist of several lines, for example
Reinforced concrete slab
t=20cm.
You can use the left mouse button to move the leader, which is displayed in the construction line color.



10 Click where you want to place the additional text, enter **2.000** for the **Text Height** and **Text Width**, enter the additional text in the dialog line and press ENTER to confirm.

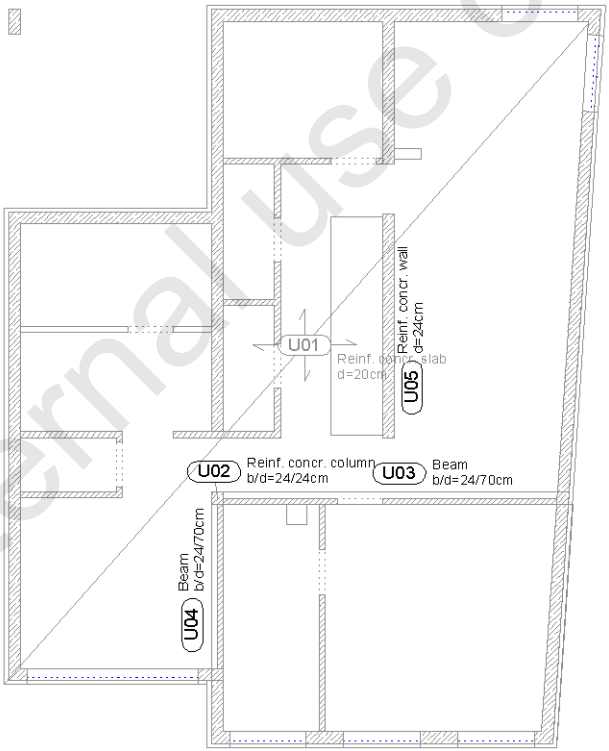
11 Press ESC twice to finish entering additional text and to quit the tool.

For internal use only

Task 2: creating marks for components

Overview

You can use the **Horizontal Mark/Vertical Mark/Aligned Mark** tools to create individual marks for components. You can place leaders to illustrate which mark belongs to which component.



Use the following tools to do this:

Tool	How to activate it
Horizontal Mark	Shortcut menu
Vertical Mark	**Tools** palette, **Create** area

For internal use only

Solution

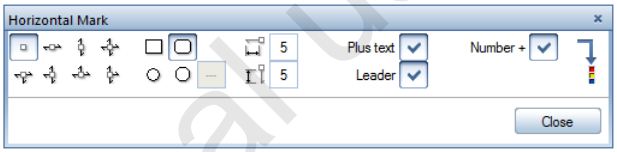
To create horizontal and vertical marks

1 Double-click the slab mark you just created with the right mouse button.

The **Horizontal Mark** tool starts automatically. Check that the layer **KP_KEY** is set.

2 On the **Horizontal Mark** Context toolbar, click **Without span direction** and select **Leader** so that you can create a leader from the mark to the component.

3 In addition, select **Number +** to switch on automatic numbering, change the text in the dialog line to **B02** and press ENTER to confirm.

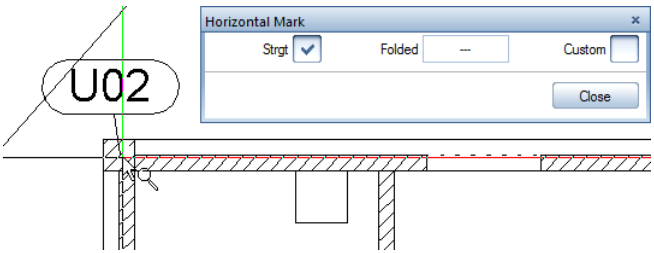


4 Place the mark, which is attached to the crosshairs, to the left of and above the interior column.

5 *Reference to point:* select the **Straight** setting and click the interior column.

This creates the leader, which connects the mark with the component. Press ESC to finish.

Tip: You can specify the type of the leader on the Context toolbar.



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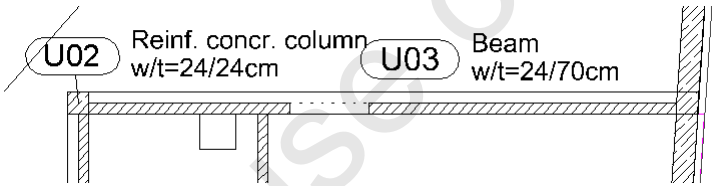
6 Change the drop-in point for the additional text:
Reinforced concrete column
w/t=24/24cm
Place it and press ESC.

Now the next mark is attached to the crosshairs. Due to automatic numbering, it is set to **B03**.

7 Place the mark above the horizontal part of the slab that differs in height, press ESC as you do not want to create a leader and place the additional text.

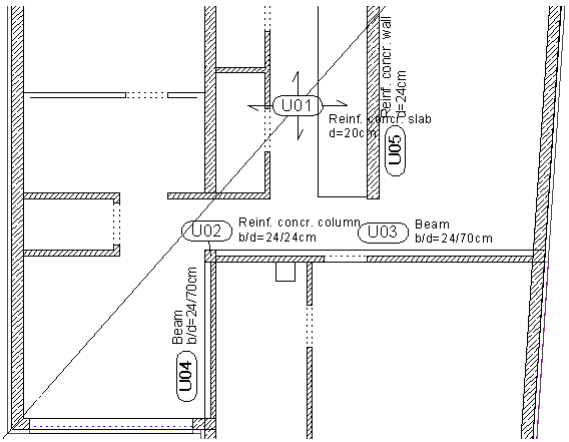


8 Press ESC twice to finish entering additional text and to quit the tool.

9 Open the **Tools** palette and click **Vertical Mark** in the **Create** area.

10 Use the same approach to create the marks for the vertical part of the slab that differs in height and the interior wall adjacent to the stair.

Tip: Click existing text to match its parameters.



For internal use only

Task 3: modifying marks

Overview

Allplan provides several methods for modifying key plans:

You can use this tool to modify the direction of load, the mark symbol shape and additional text, if any.
If there is no additional text or leader, then you can create these later.

You can use this tool to modify the mark text. This cannot be used to modify the additional text.

You can use this tool to modify the length of the direction of load arrows.
The position of the arrow stays in line with the direction.

You can use this tool to edit the contents of all the text items in a mark.

You can use this tool to change the settings of all the text items in a mark.

You can use this tool to replace text in marks.

For detailed descriptions of the tools, please refer to the Allplan help.

Next you will move the slab mark for a better overview.

Use the following tool(s) to do this:

Function	How to activate it
 **Move**	**Edit** toolbar
 **Modify Lines**	**Tools** palette, **Change** area

For internal use only

Solution

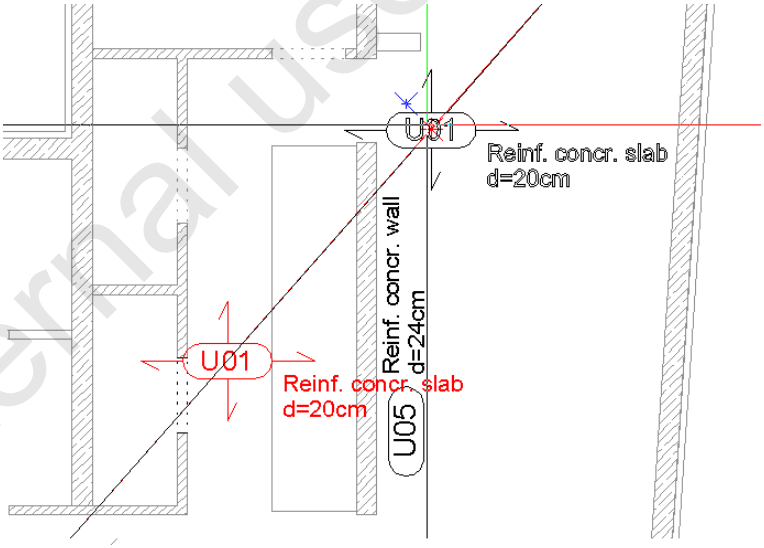
To modify marks

1 Click **Move** (**Edit** toolbar).

2 Click the mark.
This selects the additional text with the leaders and slab diagonals.

3 Click in the middle of the mark to specify the starting point for the move.

4 Drag the mark on the diagonal upward to the right and click in the workspace.



The slab diagonals have also moved.

5 Open the **Tools** palette and click **Modify Lines** in the **Change** area.

6 Click the end point of the lower diagonal and then the bottom left corner of the slab span.

7 Use the same approach to modify the line at the top.

8 Press ESC to quit the tool.

For internal use only

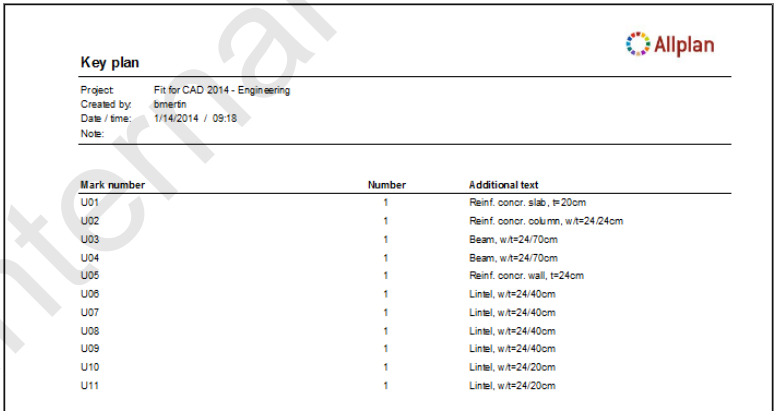
Task 4: listing marks

Overview

You can use **Report** to list the marks you have defined. You can view this report on screen, place it in the drawing file or send it to the printer.

If you want to define more comprehensive additional text for the marks, you can configure Allplan to create additional text in construction line format in order to enhance clarity. You can then create a report that includes the marks and the additional text.

Start by adding marks for the lintels (marks B06 to B11; see illustration at the beginning of this exercise). Use the **Horizontal Mark** and **Aligned Mark** tools and repeat the steps described in task 2. Then create the report.



Allplan

Key plan

Project: Fit for CAD 2014 - Engineering
Created by: bmertin
Date / time: 1/14/2014 / 09:18
Note:

Mark number	Number	Additional text
U01	1	Reinf. concr. slab, h=20cm
U02	1	Reinf. concr. column, w/t=24/24cm
U03	1	Beam, w/t=24/70cm
U04	1	Beam, w/t=24/70cm
U05	1	Reinf. concr. wall, t=24cm
U06	1	Lintel, w/t=24/40cm
U07	1	Lintel, w/t=24/40cm
U08	1	Lintel, w/t=24/40cm
U09	1	Lintel, w/t=24/40cm
U10	1	Lintel, w/t=24/20cm
U11	1	Lintel, w/t=24/20cm

Use the following tool(s) to do this:

Function	How to activate it
Report	**Tools** palette, **Create** area

For internal use only

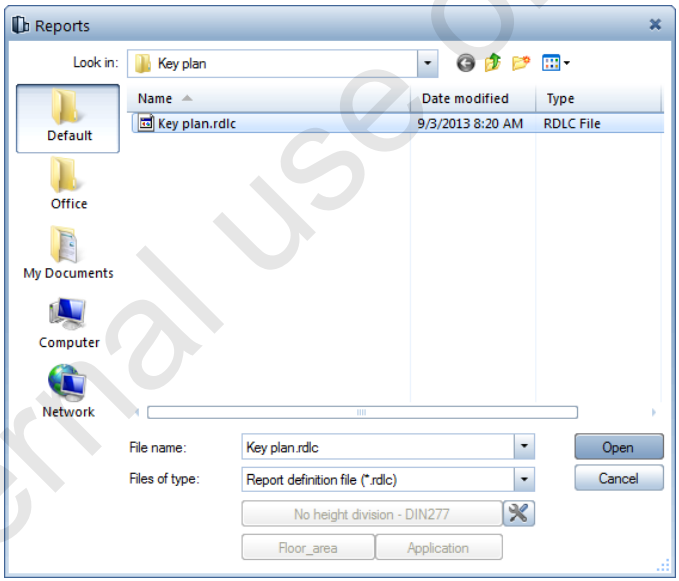
Solution

To create a report

1 Open the **Tools** palette and click **Report** in the **Create** area.

2 The **Reports** dialog box appears in which you can select predefined reports.
If necessary, click the **Default** folder on the left and select the report called **Key plan**.

Tip: You can create reports both in document edit mode and in layout edit mode.



3 Double-click with the right mouse button in the workspace or click **All** in the input options to include all the marks.

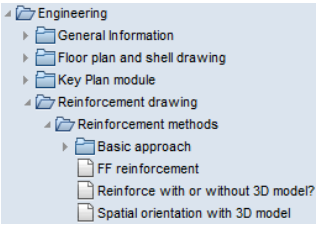
The report is displayed in the Report Viewer. Various attributes, such as the project, are included automatically.

4 You can **Print** the report or select one of the options provided by **Export**.

For internal use only

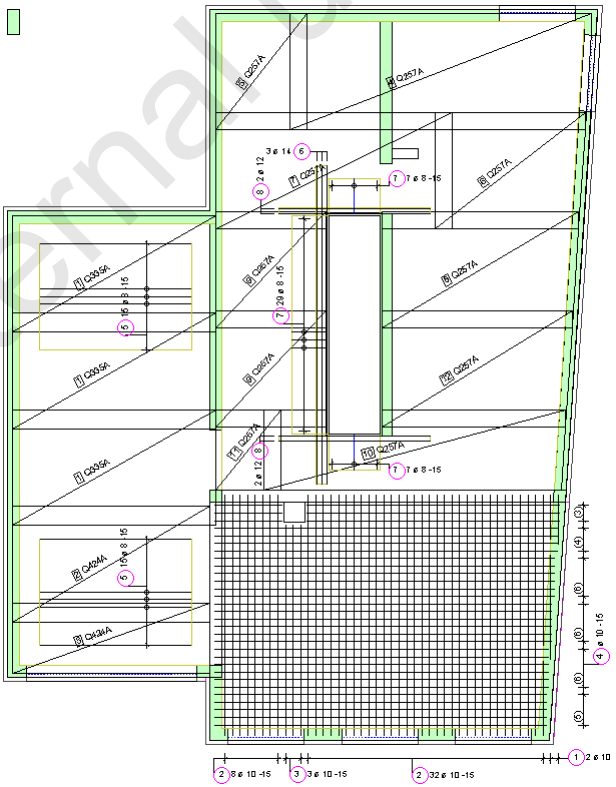
For internal use only

Exercise 3: slab above basement, bottom layer



The bottom reinforcement layer of the basement slab consists of meshes and additional reinforcing bars, which you will place as basic reinforcement. You will create two-way bar reinforcement in the lowered part of the slab.

The reinforcement mode was defined in unit 1, exercise 1, task 6. Accordingly, a three-dimensional reinforcement model is created. The requirements and results obtained with each mode are described in detail in the online help.

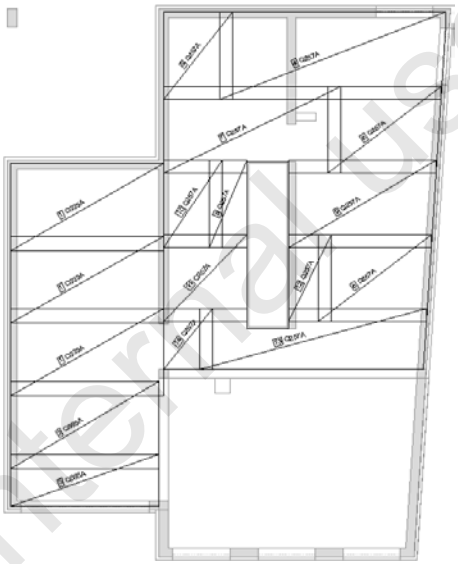


For internal use only

Task 1: mesh reinforcement, bottom layer

Overview

The placing regions of the slab spans are entered as polygons. As the area around the lowered part of the slab requires stirrups, you will not specify a support depth for the meshes you place there. Actually, anchorage in this area is achieved using open stirrups. You will use the area detection feature to take the slab recess for the stair into account.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	Double-click the left mouse button
Select, Set Layers	Double-click the right mouse button
Span Reinforcement	Wizard
Area detection	Dialog line

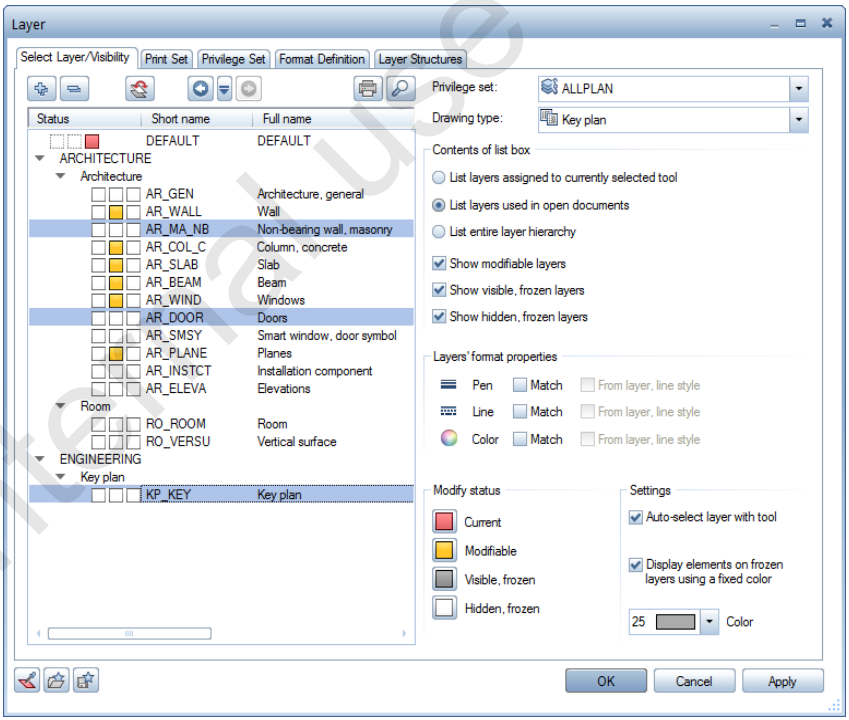
For internal use only

Solution

To create polygonal reinforcement in the left span

1 Double-click in the workspace with the left mouse button to access the **Open on a project-specific basis** dialog box and select drawing file 905 **(Reinforcement, bottom layer)**. Drawing files 900 and 903 should be open in edit mode.

2 Double-click in the workspace with the right mouse button to open the **Layer** dialog box and set the layers AR_MA_NB, AR_DOOR and KP_KEY to **Hidden, frozen**.



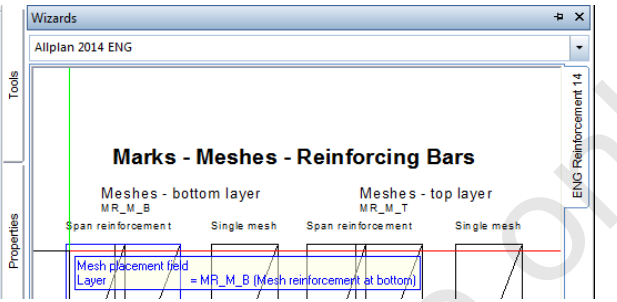
Tip: You can use **Reference Scale** on the **View** menu to set values that are not proposed for selection on the status bar.

3 Select **Reinforcement drawing** drawing type in the status bar.

4 Set the reference scale in the status bar to **1:50** and check that the current unit of length is set to **m**.

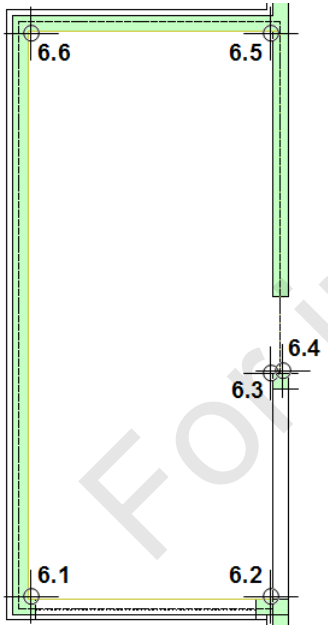
For internal use only

5 Open the **Wizards** palette and double-click the span reinforcement under **Meshes - bottom layer** with the right mouse button.

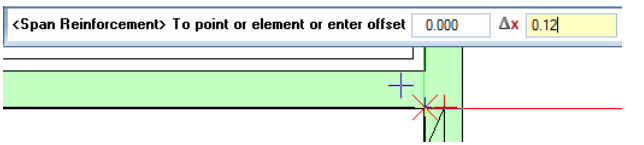


The **Span Reinforcement** tool starts automatically. The layer MR_M_B should be set to current.

6 *From point or element or enter offset:* specify the placing polygon as follows:



- Enter **0.15** for the support depth in the dialog line. Click the top left inner corner of the wall and the inner point where the offset and the wall at the bottom intersect (see illustration).
- Enter **0.00** for the support depth in the dialog line and click the top left corner of the column.
- Enter a value of **0.12** for the **X coordinate** in the dialog line and press ENTER to confirm.
- Point to the top right inner corner of the wall so that the boxes in the dialog line appear yellow, enter **0.12** for the **X coordinate** and press ENTER to confirm.



- Enter **0.15** for the support depth in the dialog line, click the top left inner corner of the wall and press ESC to close the polyline.

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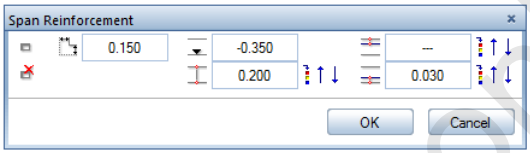
Tip: You can use **Measure Coordinates** to determine the bottom level of the slab in a view.

7 As you are working with a 3D model, define the height of the reinforcement:

Layer depth (= bottom edge of slab) **-0.35**

Component thickness (= thickness of slab) **0.20**

Concrete cover at bottom 0.03

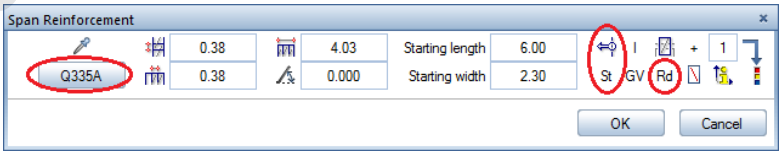


8 Click **OK** to confirm the settings.

Allplan automatically creates an associative view.

Note: The **Associative Views** module contains tools for creating self-updating views and sections for 3D general arrangement drawings and reinforcement drawings created with the 3D model being active. Unit 5 focuses on this approach.

9 A dialog box for defining the span reinforcement's placing parameters appears.
Click **Mesh type** and select **Q335A**. Click **Switch start point of placement** and deactivate staggered reinforcement by clicking the **St** button (so that it is not highlighted). Similarly, deactivate the **Rd** setting so that the meshes are not rounded off.



Note: When you select **Automatic Transverse Overlap**, only meshes of full width are placed. The value proposed by the system is displayed in the data entry box. It cannot be changed.

10 Click **OK** to confirm the dialog box.
The first span reinforcement is created.

For internal use only

To create span reinforcement with a recess

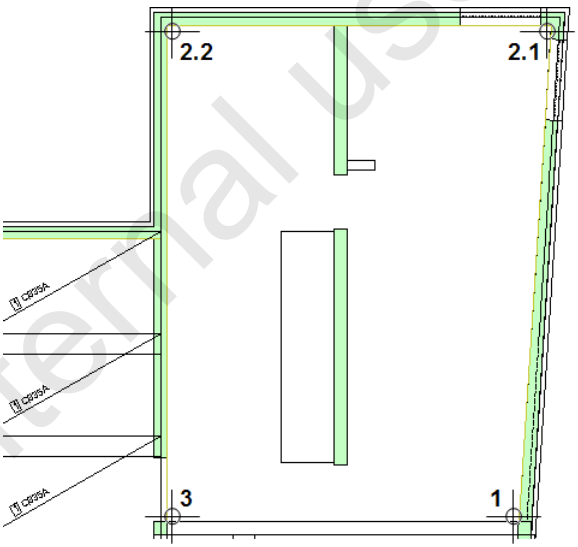
➲ The  **Span Reinforcement** tool is still active.

1 Check that the offset is set to **0.15** in the dialog line and click the point where the lowered part of the slab and the inside edge of the wall on the right intersect (see illustration).

2 Do not change the support depth and click the inner corners of the wall at the top (see illustration).

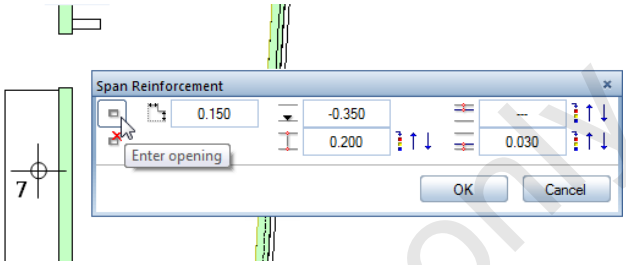
3 Enter **0.12** for the support depth in the dialog line and click the top right corner of the column (see illustration).

4 Enter **0.00** for the support depth in the dialog line and press ESC to close the polyline.



For internal use only

5 Define the **Layer depth** and **Component thickness** again and click **Enter opening**.

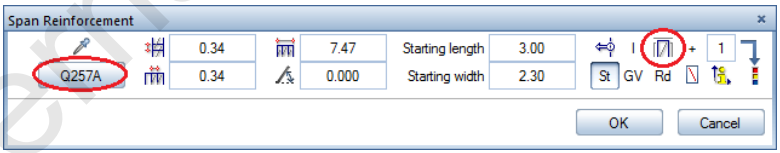


6 Select **Area detection** in the dialog line (icon is pressed in!).

7 Enter **0.05** for the support depth in the dialog line and click within the slab opening.

8 Press ESC to finish and click **OK** to confirm.

9 The dialog box for entering parameters is displayed.
Set the mesh type to **Q257A**, select **Flush** and click **OK** to confirm the settings.



10 Press ESC to quit the tool.

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A note on mesh placing modes

You can choose from different placing modes on the **Mesh Entry and Placement** flyout of the **Engineering** toolbar.

- **Mesh Shape**: you can use this to create a bent reinforcing steel mesh shape that can then be placed.
- **Place Individually**: use this approach when the size of your reinforcing steel meshes is given or you wish to define it yourself. A preview of the reinforcing steel mesh is displayed attached to the crosshairs and can be placed where you require in the size you specify.
- **Span Reinforcement**: this is most commonly used for drawing a bottom reinforcement layer in a slab or the basic reinforcement for a floor slab. You define the span as an outline polygon. The support depth can be identical on all sides or entered separately from support to support. When the area to be reinforced has been defined, a toolbar appears where you can define the type of reinforcing steel mesh, the placing direction, lap joints and the direction of the reinforcing steel mesh diagonals. You can also choose between group or single reinforcing steel mesh placement here.
- **Support Reinforcement**: use this placement for the reinforcement in the area “to be supported”. The parameters are the same as those for span reinforcement and can be set as required.
- **Edge Reinforcement**: the reinforcing steel mesh placement can be placed using a specific width on an edge that you define. The parameters are the same as those for span reinforcement and can be set as required.

Whichever method you employ, Allplan will calculate the overlap depending on the type of reinforcing steel mesh you select. The placement algorithms are designed with economic considerations in mind. However, you can change this at any time by specifying the lap joint yourself. The lap joint can be labeled if required (see **Options - Reinforcement - Labels** page).

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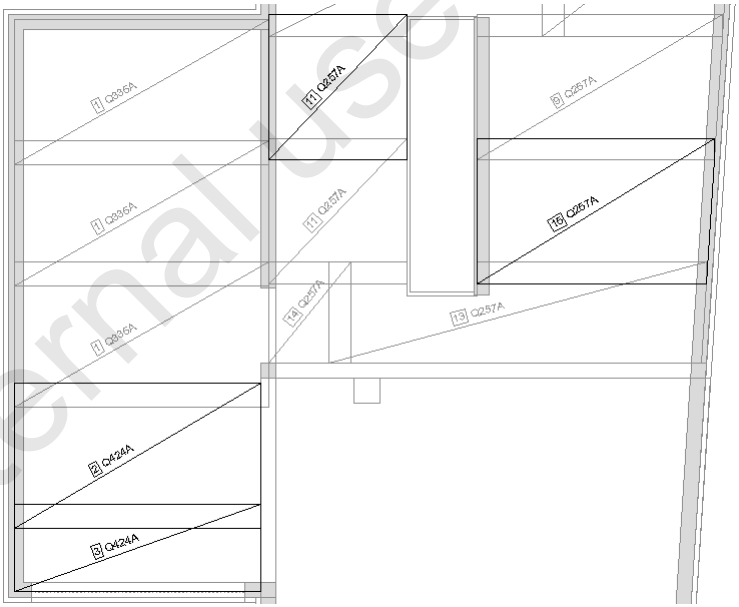
Task 2: modifying meshes

Overview

Due to the high loads in the left span, you need to strengthen the reinforcement in the placing region at the bottom. To do this, you will modify a part of the placing region by changing the mesh type.

The lap joints in the area around the slab opening are not required. Delete the mesh sections at the opening and modify the length of the remaining meshes.



Use the following tools to do this:

Function	How to activate it
Modify Local Placement Parameters	**Engineering Modify** flyout
Delete	**Edit** toolbar
Stretch Entities	**Edit** toolbar

For internal use only

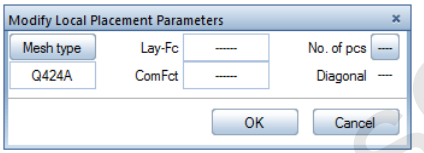
Solution

To modify meshes in a specified region

1 Click **Modify Local Placement Parameters** (**Engineering** **Modify** flyout).

2 Select the two bottom meshes in the placing region on the left by enclosing them in a selection rectangle (from left to right).

3 Click the **Mesh Type** button and select **Q513** in the list box.



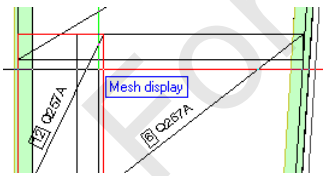
Note: Changing the mesh type does not affect the overlap values. If necessary, you can change these values using **Modify Offset** (**Edit** toolbar).

4 Click **OK** to confirm the settings. The mesh type of the two meshes changes.

To combine meshes

1 Click **Delete** (**Edit** toolbar).

2 Select the two short mesh sections at the slab opening by clicking their edges or diagonals.



Make sure that you select and delete the meshes. Do not select the slab. Pay attention to the ToolTip that appears when you move the cursor to an element. The ToolTip shows a short description about the relevant element.

3 Click **Stretch Entities** (**Edit** toolbar). Select the two end points of the remaining upper mesh by enclosing them in a selection rectangle (from left to right).

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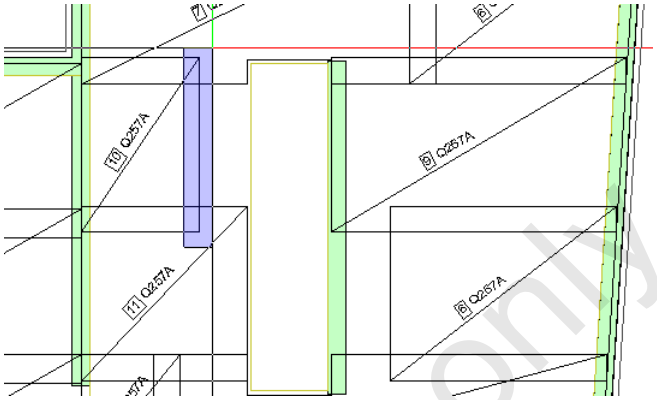
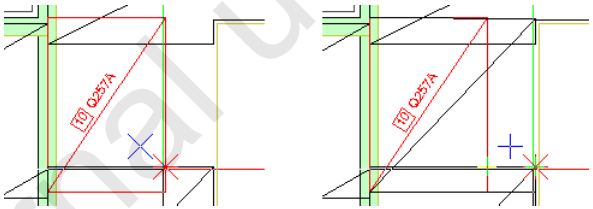


4 Modify the length of the mesh by clicking the point where it intersects the neighboring mesh and the end point of the neighboring mesh.



5 Modify the lower mesh in the same way.

A note on selecting elements based on direction

The default setting in the **Filter Assistant** is
Select Elements Based on Direction.
In this mode, the elements Allplan selects depend on the direction in which you enter the selection rectangle:

- From right to left: Allplan selects the elements that are fully bounded or intersected by the selection window. The selection rectangle is dashed, and the area it covers is displayed in green while you are selecting elements.
- From left to right: Allplan only selects the elements that are fully bounded by the selection window (here, the area covered by the selection rectangle is displayed in violet).

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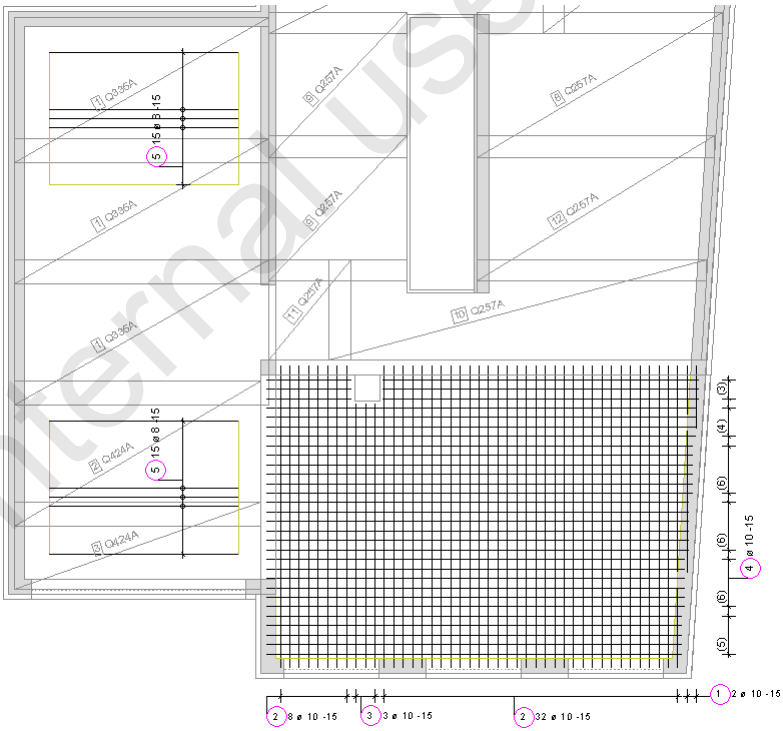
Task 3: bar reinforcement, bottom layer

Overview

Using the **Enter Area Reinforcement** tool, you can apply reinforcement in areas (for example, slabs or walls) in a single step. You will use the options provided with this tool to create two-way reinforcement in the lowered part of the slab and additional reinforcement in the placing region on the left. You can find the tools you need in the wizard and on the **Engineering** toolbar, **Area Reinforcement** flyout.



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Use the following tool(s) to do this:

Function	How to activate it
 **Enter Area Reinforcement**	Wizard
 **Span Reinforcement**	**Enter Area Reinforcement** Context toolbar
 **Area detection**	Dialog line
 **Dimension Line, Label**	**Display** flyout or wizard
 **Single Placement**	**Area Reinforcement** flyout
 **Rearrange Marks**	**Engineering Modify** flyout
 **Move**	**Edit** toolbar

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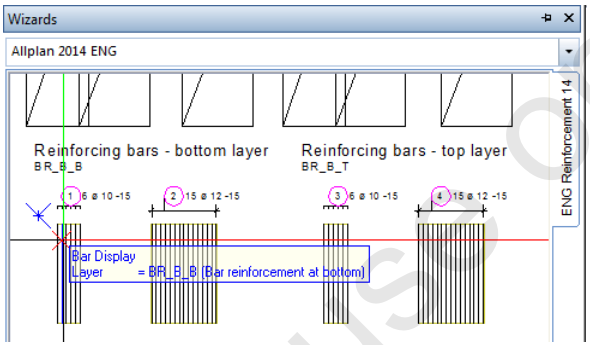
Solution

To place two-way span reinforcement

1 Open the **Wizards** palette and double-click a placement under **Reinforcing bars - bottom layer** with the right mouse button.

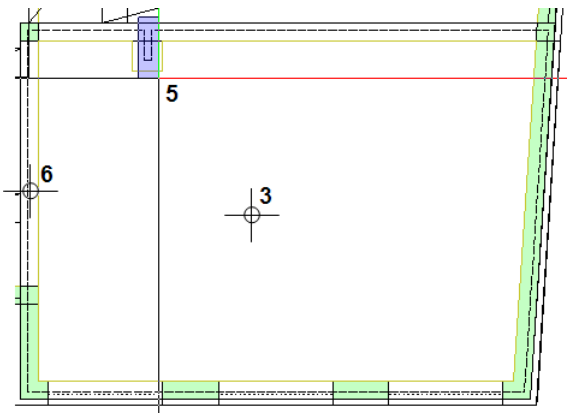


The **Enter Area Reinforcement** tool starts automatically. Check that the **BR_B_B** layer is set.

2 Click **Span Reinforcement** on the Context toolbar.

3 *From point or element or enter offset:* enter **0.15** for the offset and select **Area-detection** (icon is pressed in!) in the dialog line. Then click in the lowered part of the slab.

This selects the placing region. The edges of the recess for the chimney serve as edges of the general arrangement.



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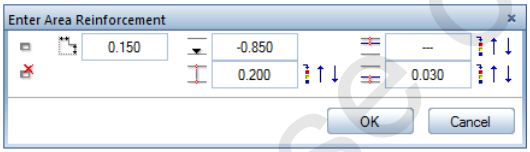
4 Click **Support depth** in the dialog box.

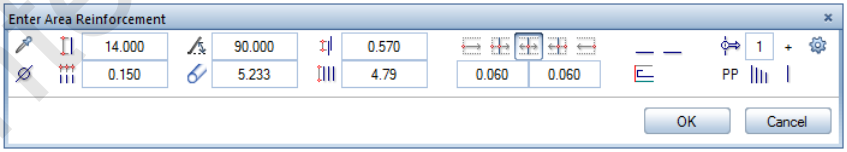
5 *Click side of polygon:* select the sides of the recess by enclosing them in a selection rectangle (from left to right) and enter **-0.05**.

6 Click **Support depth** again, click the left side of the polygon and enter **0.00**.

7 Define the height of the reinforcement (**Layer depth**, **Component thickness**, **Concrete cover at bottom**) and click **OK** to confirm the dialog box.



8 The **Enter Area Reinforcement** Context toolbar opens. Set the placing parameters for the vertical reinforcement:
Diameter **10**
Spacing 0.15
Angle of placement **90.00**
Equal offsets to edge
Select **PP** (= place in polygon) at bottom right.



9 Click **Placing parameters**, select **Different** for the mark number and click **OK** to confirm.

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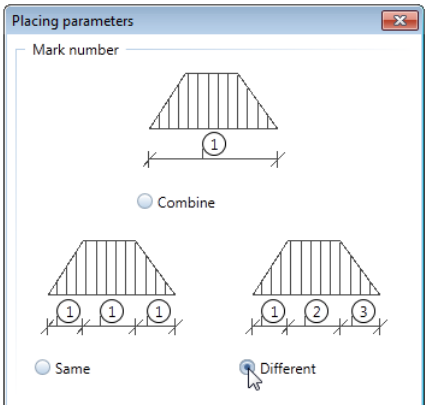
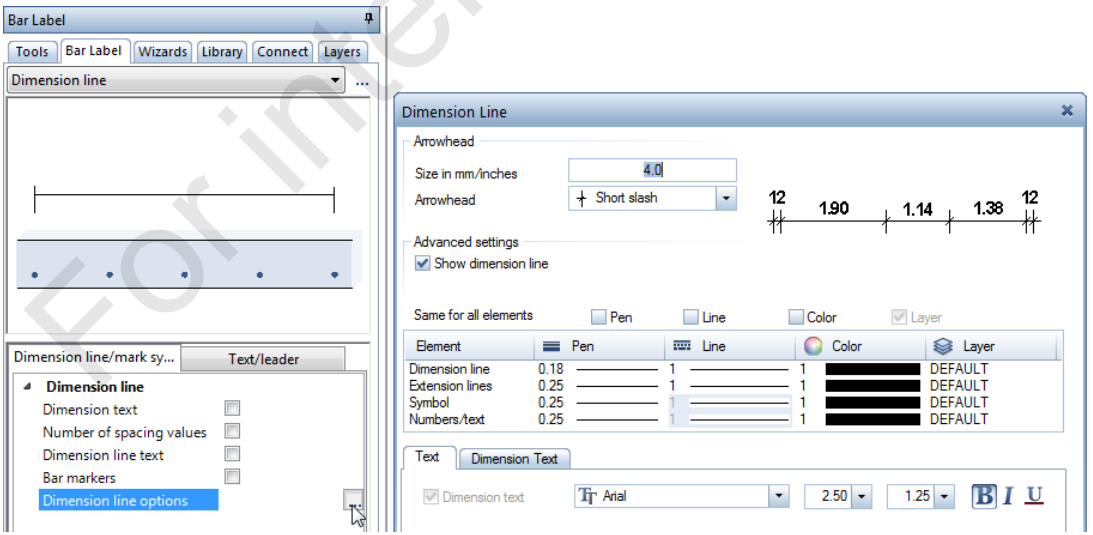


10 Click **OK** to confirm the settings on the **Enter Area Reinforcement** Context toolbar.

11 Open the **Bar Label** palette and click in the title bar to make sure that the palette is visible while the tool is active.

12 Set the dimension line type to **Dimension line** and make appropriate settings.

13 Select the **Dimension line options** parameter and click . The **Dimension Line** dialog box opens. Check that the layer is set to **BR_GEN**. Change the aspect to **1.00**.



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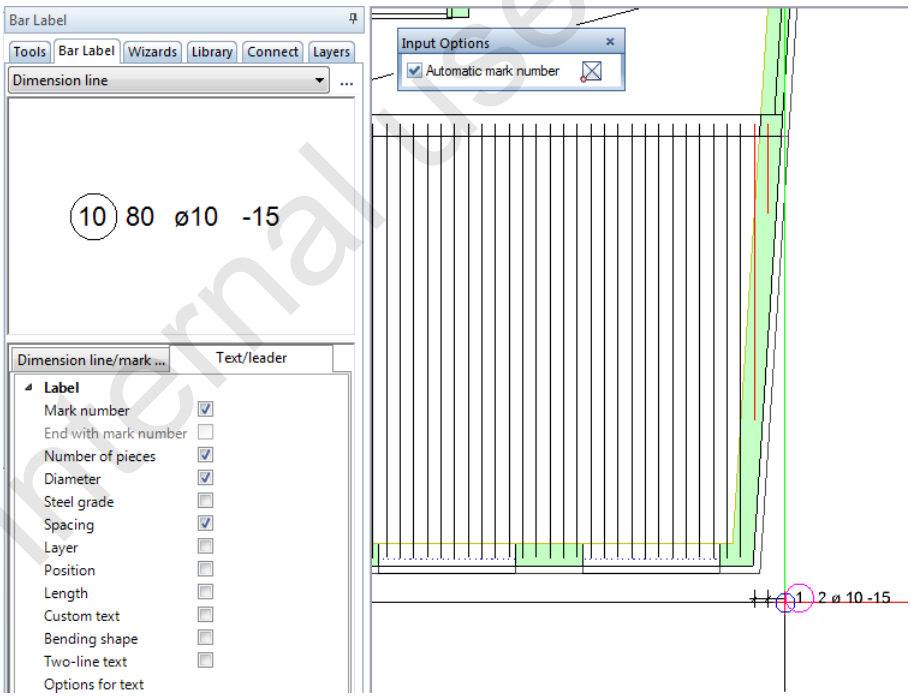
14 Click **OK** to confirm the **Dimension Line** dialog box and click a point through which the dimension line is to pass.

The palette switches to the **Text/leader** tab, where you can define the label for the placement.

15 Set the label parameters so that the number of pieces, diameter and spacing are displayed.

Note: Automatic mark number is selected in the input options. Depending on the drop-in point specified, the program automatically creates the mark number at the beginning or end of the label. You can check this by moving the crosshairs over the workspace.



16 Select the **Options for text** line and click ..., enter **1.00** for the aspect and click **OK** to confirm. Place the label.

17 Place the labels for the other placements. Leave the settings as they are.

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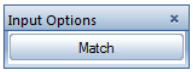
18 Next, you will place the horizontal reinforcement. You do not need to enter the polygon again. You can copy the one you used for the vertical reinforcement. Click **Match** in the input options.



19 *Select the polygon you want to match:* click the existing polygon.

Allplan has automatically increased the concrete cover to **0.04**.

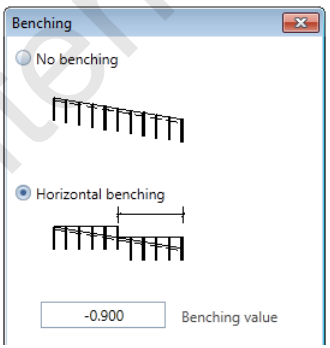
20 Use the procedure previously described to change the left support depth at the vertical slab offset to **0.15**.

21 Change the top and bottom support depths at the horizontal slab offset and at the exterior wall to **0.00**. Then click **OK** to confirm the dialog box.

In the following **Enter Area Reinforcement** Context toolbar, the system will automatically propose 180 degrees for the placing **Angle**.

22 Click **Benching**, select horizontal benching and enter **-0.900** for the benching value. Then click **OK** to confirm.

Tip: On the Context toolbar, the icon shows the selected benching mode.



23 Click **Placing parameters** and check that the **Same** setting is active for the mark number.

24 Click **OK** to confirm the settings on the **Enter Area Reinforcement** Context toolbar and press ESC to skip labeling entirely.

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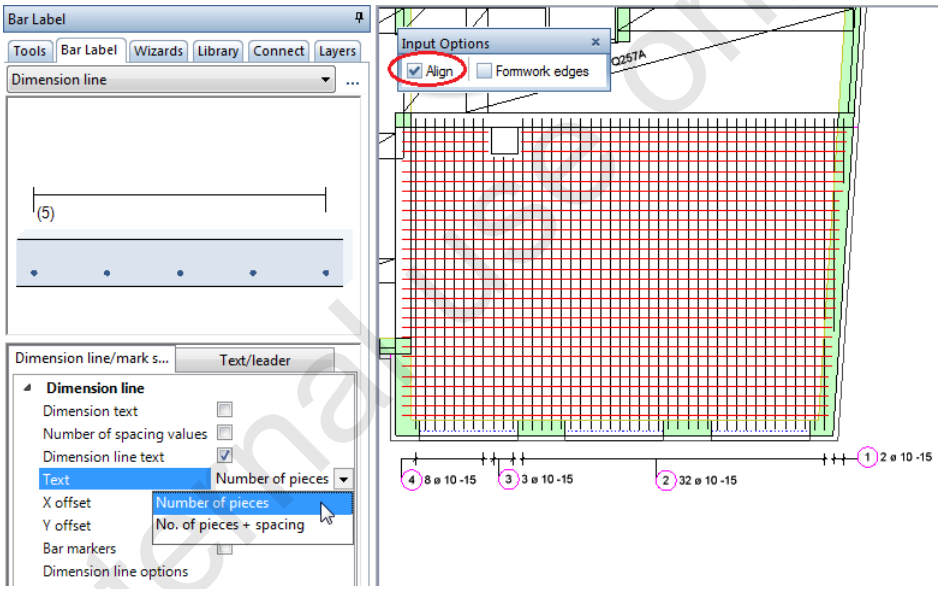
To label placements later

1 Click **Dimension Line, Label** (**Display** flyout).

2 Select all horizontal placements by enclosing them in a selection rectangle (from left to right).

3 Select the **Dimension line text** option and select **Number of pieces** for the text.



4 Select the **Align** option in the input options and place the dimension line.

5 For the label, switch off the **Number of pieces** parameter, place the label and press ESC to quit the tool.

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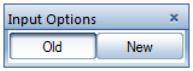
To create additional reinforcing bars

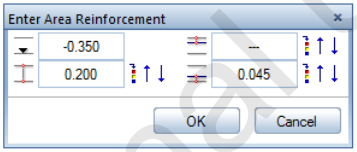
1 Click **Single Placement** (**Area Reinforcement** flyout).
Check that the layer **BR_B_B** is current. If it isn't, select it on the **Format** menu or toolbar.

2 *Select view* **Old** is selected in the input options so that you can match an existing view. Click within the floor plan.

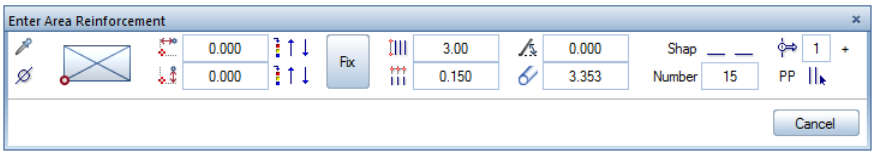


Note: You only need to specify the view when you are working with a 3D model. The same applies to the height definition.

3 Check the height, specify the component thickness and the concrete cover and click **OK** to confirm.



4 Define the placing parameters:
Diameter 8
Placing length 3.00
Spacing 0.15
Angle of placement **0.00**
Number of bars **15**
For the placement display mode, click **Show selected bars** so that only selected bars will be visible when the placement is displayed in plan view.



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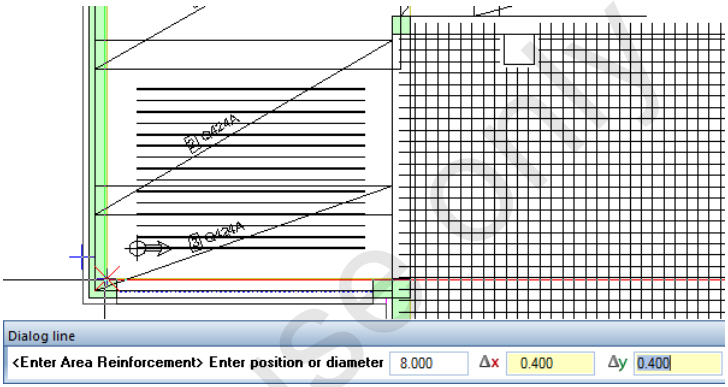
Tip: As an alternative to TAB and Shift-TAB, you can also use the 'Page Up' and 'Page Down' keys to toggle between the data entry boxes.

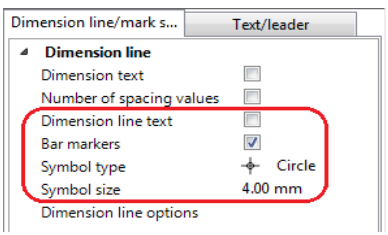
5 Point to the bottom left corner of the interior wall, set both the Δx **X coordinate** and the Δy **Y coordinate** to **0.40** and press ENTER to confirm.
Use the TAB key to switch between the boxes.



Note: As soon as Allplan snaps to a point in the workspace, this point will serve as the reference point. This is indicated by yellow data entry boxes. The preview of the bars updates to reflect the coordinates you specify.

6 *Select the bar you want to display:* all the bars are displayed in the selection color in the preview. Click the bars you want to display in the slab span and press ESC.

7 Clear the **Dimension line text** check box, select the **Bar markers** option, specify the **Symbol type** and **Symbol size** and place the dimension line inside the placement.



8 For the label, select the **Number of pieces** parameter and place the label.

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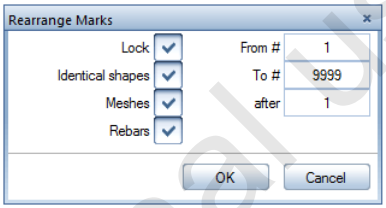
9 The **Single Placement** tool is still active. Click **OK** to confirm the height.

10 Change the **Anchor point** to top left and check that the placing length is set to **3.00** m. Enter **0.40** for the **X coordinate** and **-0.40** for the **Y coordinate** and place the bars at the top left corner of the interior wall.

11 Select the desired bars, place the dimension line and the label and press ESC to quit the tool.

12 Although the same bar shape was placed at the top and bottom, the two placements have been assigned consecutive marks.
Click **Rearrange Marks** (**Engineering Modify** flyout) and confirm the settings.



Note: As a result, the meshes are also given consecutive marks again.

13 You can use the **Move** tool (**Edit** toolbar) to move the constituent parts of the label as a whole or individually. If necessary, place the label in a new position.
To edit the contents of the label, click it, open the **Properties** palette and change the settings as you need. You can also select several elements and then pick out the desired elements in the list box at the top of the palette.

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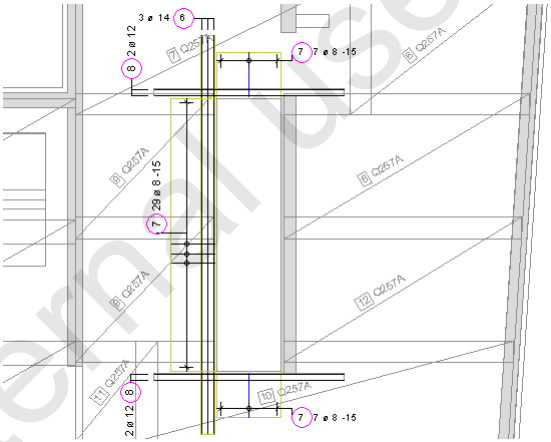
Task 4: additional reinforcement for stair opening

Overview

In the area around the stair opening, the free edge of the slab requires additional reinforcing bars (3 ∅ 14). To create the edge reinforcement, you will use open stirrups. Using the same approach, you can create the edge reinforcement around the upper and lower edges of the slab opening.



Use the following tool(s) to do this:

Function	How to activate it
Enter Area Reinforcement	Double-click existing placement with the right mouse button
Additional Reinforcement	Context toolbar
Edge Reinforcement	Context toolbar
Copy and Mirror	**Edit** toolbar
Midpoint	Shortcut menu when entering points
Rearrange Marks	**Repeat** menu

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Solution

To place additional reinforcement

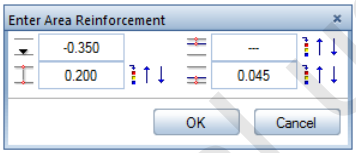
1 Double-click the area reinforcement you created beforehand with the right mouse button.

The **Enter Area Reinforcement** tool starts automatically.

2 Check that the layer **BR_B_B** is current. If it isn't, select it on the **Format** menu or toolbar.

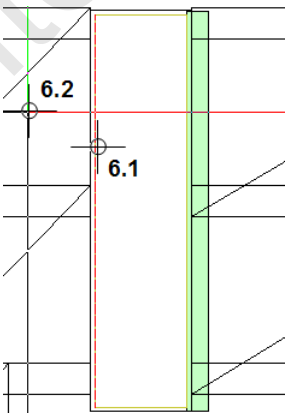
3 Click **Additional Reinforcement** on the Context toolbar.

4 *Select view* Click within the floor plan and confirm the dialog box with the height settings.



5 Click **Edge** (match edge) in the input options.

6 *Select formwork edge to be used for bar:* click the free edge of the slab on the left and define the placing direction by clicking within the slab.



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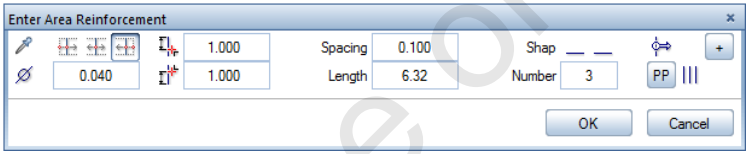
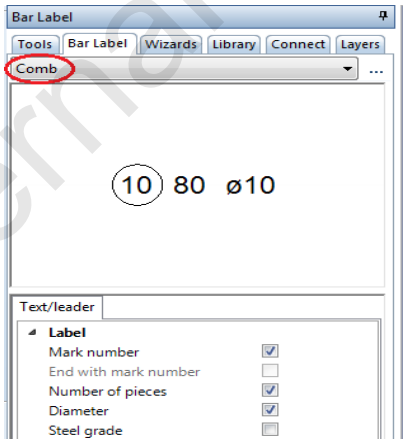
7 Make the following settings on the **Enter Area Reinforcement** Context toolbar and then click **OK** to confirm.
Diameter **14**
Bar displacement **0.04**
/ Anchorage length at start / end **1.00**
Spacing **0.10**
Number of bars **3**
and set the placement display mode to **Show all bars.**



8 Select the **Comb** dimension line type in the palette and set the text parameters so that only the number of pieces and the diameter are included.



9 Select the **Options for text** parameter and click ..., enter **1.00** for the aspect and click **OK** to confirm.

Tip: The value for the spacing or the length of the leader is the actual value in the layout in [mm]. The same applies to the text size.

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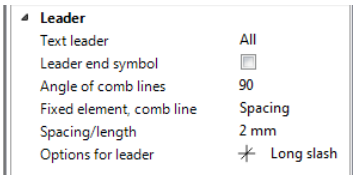
10 Check the **Leader** area to see if the angle of the comb lines is set to **90.00** degrees. Set the fixed element of the comb line to **Spacing** and enter **2.00** for the spacing between the leaders of the comb and the bars.



11 Move the crosshairs above the placement to the left until the mark number appears at the end; then place the label.

12 Press ESC to quit the tool.

The Context toolbar of the **Enter Area Reinforcement** tool is displayed again.

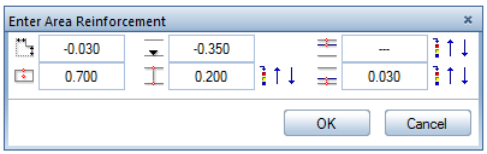
13 Click **Edge Reinforcement** and then click within the floor plan.

14 *1st edge point or click a line:* click the left edge of the slab again. Make sure that you do not click the edge near a point.

15 *2nd point or direction point:* click within the slab in order to specify the direction point.

16 On the **Enter Area Reinforcement** Context toolbar, click **Support depth**, click a side of the polygon and define the offset.
Enter an offset of
-0.03 for the side towards the edge of the slab and enter an offset of **0.00** for all the other sides.

17 Enter **0.70** for the **Edge reinforcement length**, specify the height and click **OK** to confirm.



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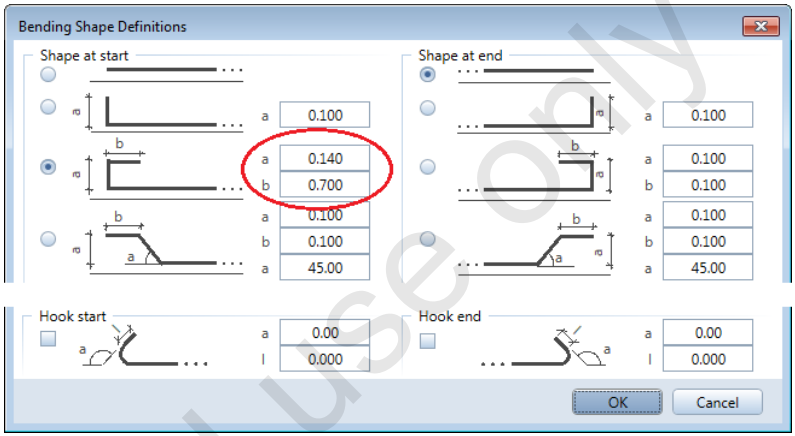
18 On the **Enter Area Reinforcement** Context toolbar, select Diameter **8**, Spacing **0.15** and Angle **180.00** °.

19 Click **Shape**.
The following dialog box appears:

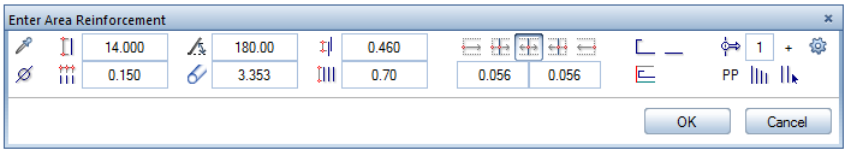
Tip: After you have defined the bending shapes, the bending shape further down is always created at the start point. You can use the placing angle to control the position of the start point. In addition, **Switch start point** moves the start point to the other side of the placement.



20 Select the bending shapes for the start and end of the bar displayed at the top for the edge reinforcement.

21 Enter the values **0.14** and **0.70** for the 'a' and 'b' parameters of the bending shape at the start of the bar and click **OK** to close the dialog box.

22 Set the placement display mode to **Show selected bars**. The Context toolbar on your screen should display the following settings.



23 Click **OK** to confirm and select the bars to be displayed.

24 Set the dimension line type to **Dimension line** and place the dimension line and the label with number of pieces, diameter and spacing.

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25 The next edge point for the next placement is now displayed attached to the crosshairs. Click the bottom right corner of the slab opening.

26 Specify the **Support depth** and **Edge reinforcement length**, confirm the settings and place the label.

27 Press ESC twice to quit the tool.

Tip: The bracket feature allows you to mirror the placement and label in a single step.

Select the placing polygon. This automatically selects all bars of the edge reinforcement.

28 Mirror the edge reinforcement at the bottom to the top edge of the slab opening using the **Copy and Mirror** tool.
To define the center axis of the recess, use **Midpoint** on the shortcut menu available for entering points.

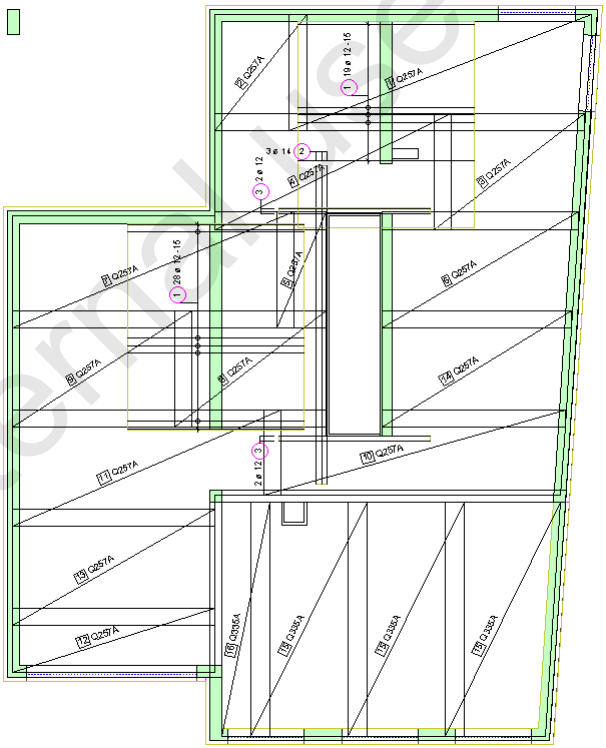
29 Use **Enter Area Reinforcement - Additional Reinforcement** to create the longitudinal bars (2∅12) at the top and bottom edges of the opening.

30 Select **Rearrange Marks** (**Repeat** menu) and click **OK** to assign the same mark number to identical reinforcing bars.

For internal use only

Exercise 4: slab above basement, top layer

The top reinforcement layer of the basement slab consists of meshes and additional reinforcing bars placed as basic reinforcement above the walls.
You will cut out the mesh sections in the lowered part of the slab.

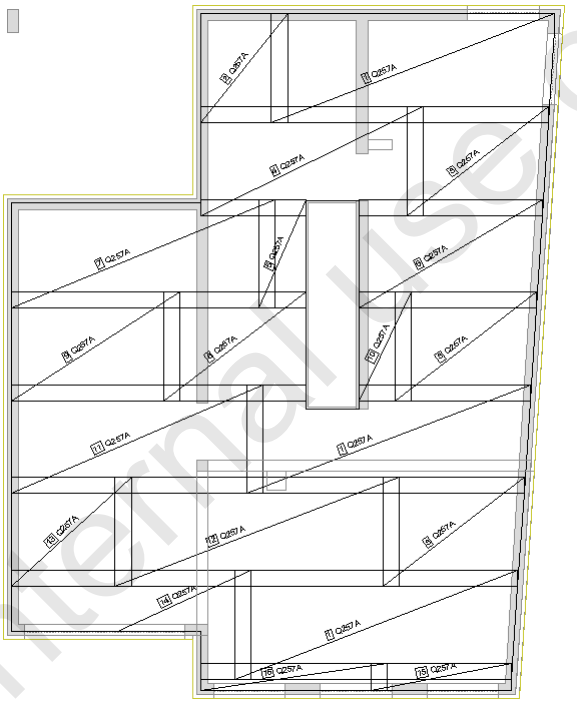


For internal use only

Task 1: mesh reinforcement, top layer

Overview

You will begin by placing the mesh reinforcement – the difference in slab height will be ignored for the time being.

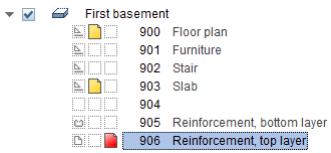


Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
Span Reinforcement	Wizard
Area detection using additional point	Input options
Area detection	Dialog line

For internal use only

Solution

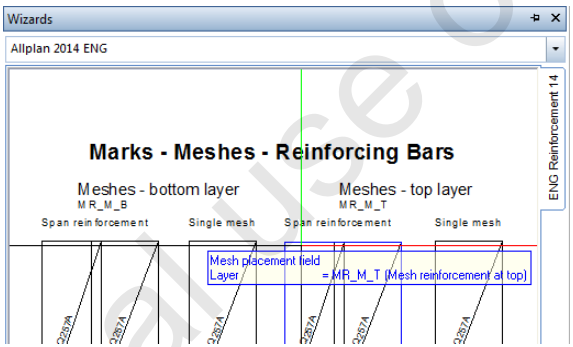


To create basic reinforcement using meshes

1 Make drawing file 906 current and close drawing file 905.

2 Check the reference scale in the status bar (**1:50**).

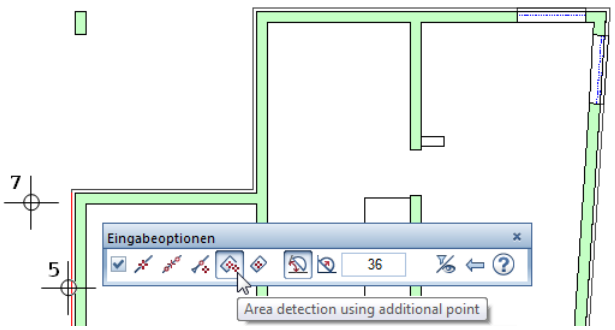
3 Open the **Wizards** palette and double-click the span reinforcement under **Meshes - top layer** with the right mouse button.



The **Span Reinforcement** tool starts automatically. The layer **MR_M_T** should be set to current.

4 Double-click in the workspace with the middle mouse button to display the full drawing.

5 *From point or element or enter offset:* enter **0.00** for the support depth in the dialog line and click the left vertical edge of the slab span. Make sure that you do not click the edge near a point.



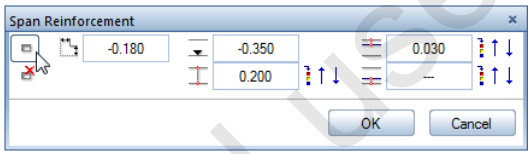
For internal use only

6 Click **Area detection using additional point** in the input options.

7 Click to the left of the red line. Allplan automatically detects the outline of the entire slab span without you having to click each corner of the floor plan separately.

8 Click **Support depth**, double-click with the right mouse button in the workspace to address all sides of the polygon and enter **-0.18** for the support depth.

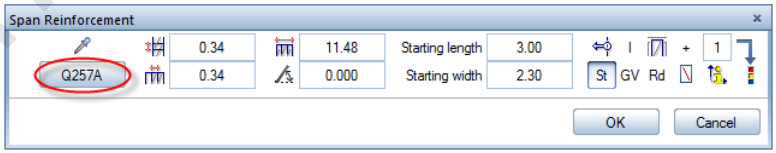
9 Define the height of the reinforcement (**Layer depth**, **Component thickness**, **Concrete cover at top**) and click **Enter opening**.



10 Use **Area detection** to define the recess for the stair as for the bottom mesh layer. Enter an offset of **0.05**.

11 Press ESC to finish entering recesses and click **OK** to confirm the dialog box.

12 The dialog box for entering parameters is displayed. Check the settings (**Q257A** mesh type, **Flush**) and click **OK** to confirm.



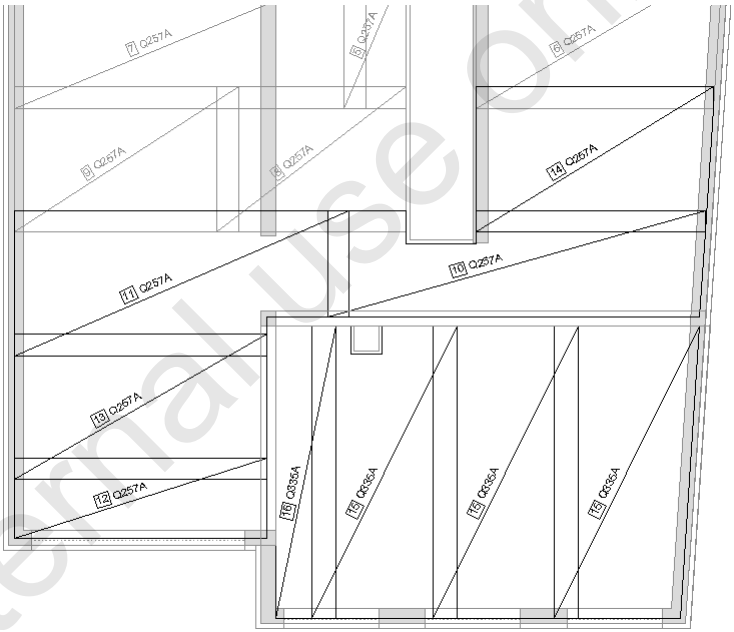
13 Press ESC to quit the tool.

For internal use only

Task 2: cutting meshes

Overview

Now you will cut out the mesh reinforcement in the lowered part of the slab.



Use the following tools to do this:

Tool	How to activate it
Cut Mesh	Shortcut menu
Delete	**Edit** toolbar
Stretch Entities	**Edit** toolbar
Rearrange Marks	**Engineering Modify** flyout
Span Reinforcement	**Repeat** menu

For internal use only

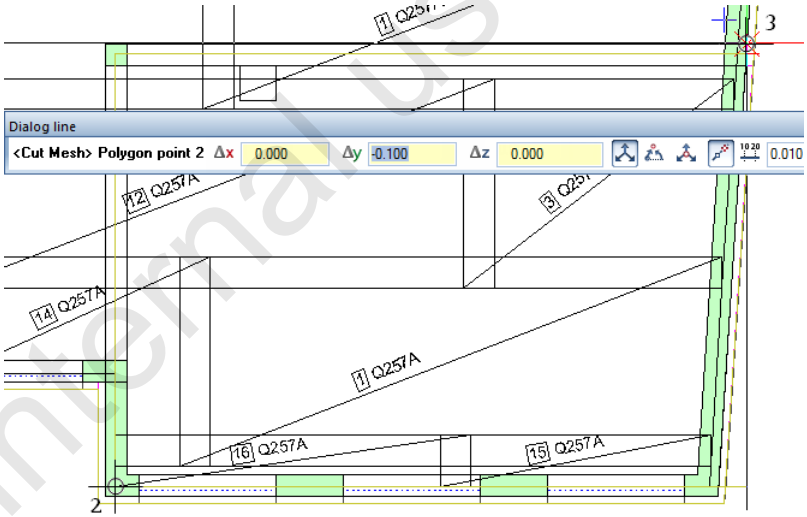
Solution

To cut out mesh reinforcement later

1 Click a mesh with the right mouse button and select **Cut Mesh** on the shortcut menu.

2 *Place polygon point 1:* click the bottom left corner of the mesh polygon.

3 *Place polygon point 2:* enter **-0.10** for the **Y coordinate** in the dialog line, move the crosshairs to the top point where the slab offset and the exterior edge of the wall intersect until the boxes in the dialog line are displayed in yellow. Then click in the workspace.



4 Finish entering the polyline and quit the tool by pressing ESC.

5 Create two meshes without lap joints as for the bottom mesh layer: one mesh to the right of the slab opening and the other mesh to the left of the lowered part of the slab. To do this, use the **Delete** and **Stretch Entities** tools.

6 Create a top layer for the lowered part of the slab yourself and rearrange the mesh marks.
Pay attention to the bottom level of the slab: enter -0.85.

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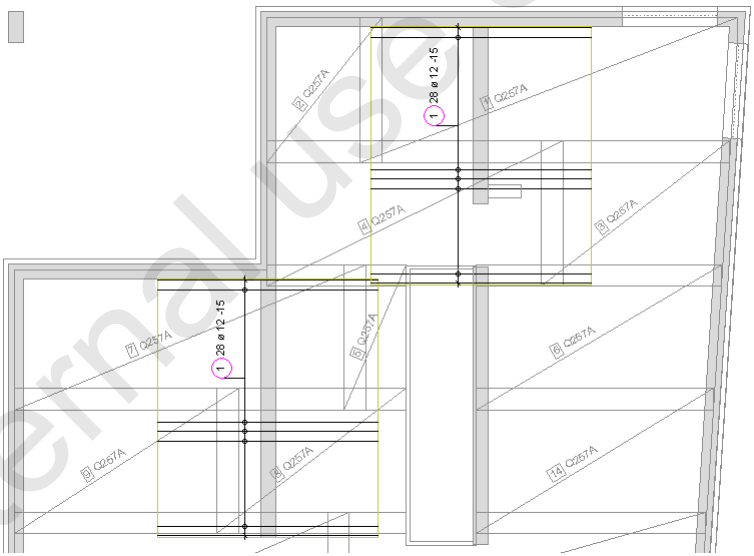
Task 3: support reinforcement with reinforcing bars

Overview

You will begin by creating support reinforcement for the vertical wall on the left. Then you will copy it to the wall above the opening for the stair.



Use the following tools to do this:

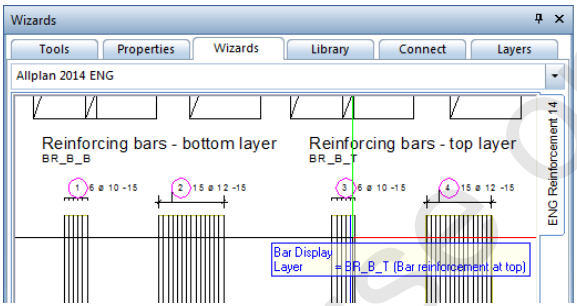
Tool	How to activate it
Enter Area Reinforcement	Wizard
Support Reinforcement	Context toolbar
Copy	**Edit** toolbar
Bracket feature	Click the right mouse button

For internal use only

Solution

To create support reinforcement for interior walls

1 Open the **Wizards** palette and double-click a placement under **Reinforcing bars - top layer** with the right mouse button.



The **Enter Area Reinforcement** tool starts automatically. Check that the **BR_B_T** layer is set.

2 Click **Support Reinforcement** on the Context toolbar.

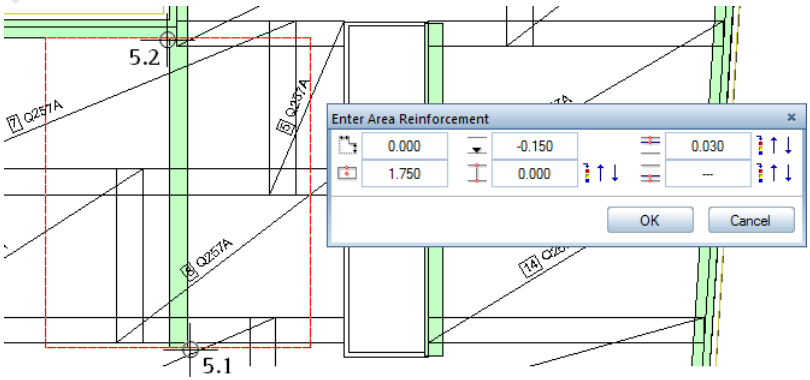
3 *Select view* Click within the floor plan.

4 Enter **90** degrees for the angle in the dialog line or click a vertical edge of the wall.

5 Click the two diagonally opposite points of the wall:

- Bottom right corner of the wall on the left
- Top left point where the wall and the exterior wall intersect

Note: Make sure that the system does not snap to a point when you click the edge.



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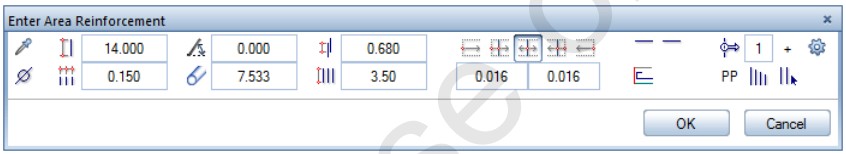
6 Set the **Support Depth** on all sides to **0.00**.

7 Enter **1.75** for the **Support Reinforcement Length**, specify the height and click **OK** to confirm.

8 Make the following settings and click **OK** to confirm:
Diameter: **12**
Spacing: **0.15** cm
Straight Bar
Display mode: **Show Selected Bars**



9 Select the desired bars, define the dimension line and label type and place them in the drawing file.

10 Press ESC twice to quit the tool.

11 To create support reinforcement for the wall above the stair opening, select **Copy** (**Edit** toolbar).

12 *Select element(s) you want to copy* Select the placement you just created using the bracket feature and the entity group selection method:

- Click in the workspace with the right mouse button to open the **Brackets**.
- Click on a bar in the placement with the middle and then left mouse button.
- Click on an element of the dimension line or label with the middle and then left mouse button.
- Close the **Brackets** by clicking in the workspace with the right mouse button again.

13 *From point:* click the top left point where the wall on the left and the exterior wall intersect.

Tip: You can also select the bracket feature in the **Filter Assistant** toolbar.

You can also select an entity group by pressing the SHIFT key while clicking an element of the entity group.

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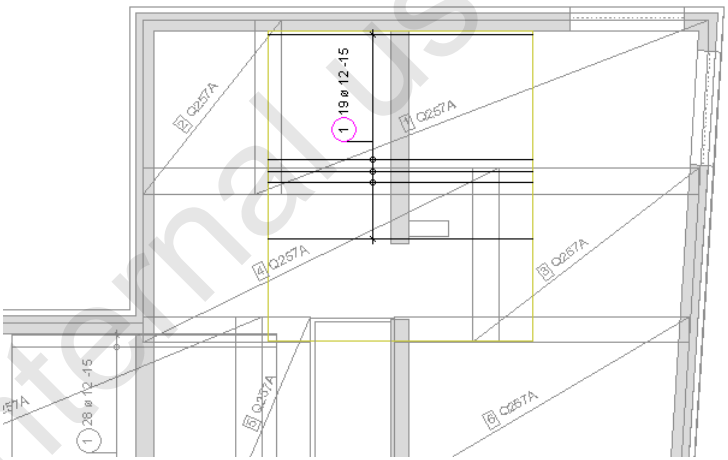
14 *Place point (to point) or enter the number of copies* click the top left point where the wall above the stair opening and the exterior wall intersect.

15 Press ESC to quit the tool.

Task 4: modifying support reinforcement

Overview

As the placing region of the support reinforcement you copied is too large, you need to change the size of the placing geometry.



Use the following tool(s) to do this:

Function	How to activate it
Modify Placing Geometry	Shortcut menu
Move	**Edit** toolbar
Modify Placement Display Mode	Shortcut menu

For internal use only

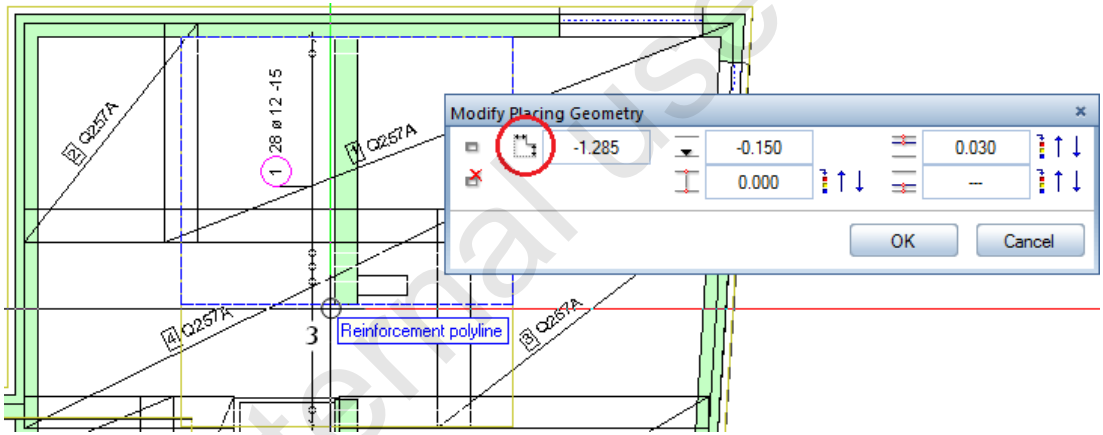
Solution

To modify the placing geometry

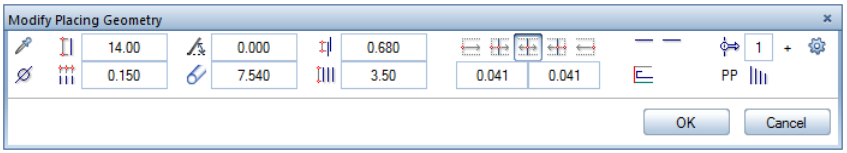
1 Click a bar of the wall's support reinforcement above the stair opening with the right mouse button and select **Modify Placing Geometry** on the shortcut menu.

2 Click **Support depth** and then the bottom side of the polygon.

3 *Point through which side of polygon is to pass or enter offset:* click a corner at the end of the wall and confirm by clicking **OK**.



4 Click **OK** to confirm the context toolbar without changing the parameters. Then press ESC to quit the tool.



5 If necessary, correct the position of the label using the **Move** tool.

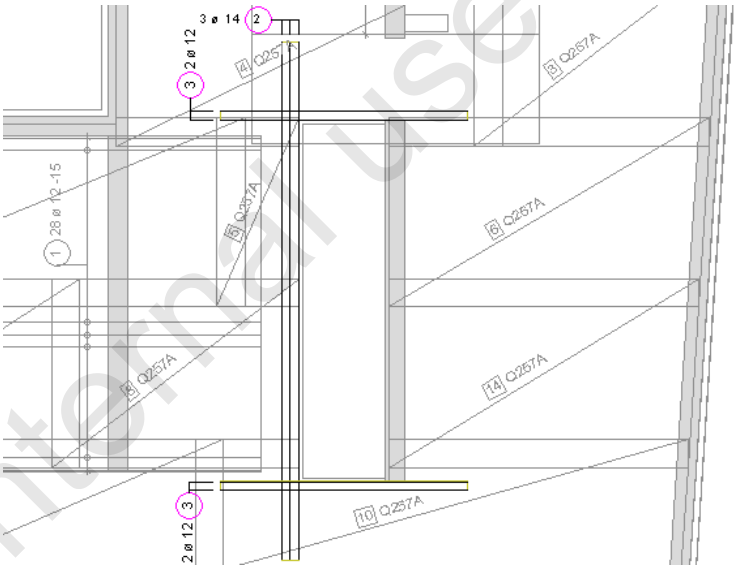
6 If necessary, select **Modify Placement Display Mode** on the shortcut menu to modify the way reinforcement is displayed.

For internal use only

Task 5: additional reinforcement for stair opening

Overview

Like the bottom layer, the top layer also requires additional reinforcing bars (3 ∅ 14 and 2 ∅ 12) for the free edge of the stair opening. You do not need to create these bars from scratch. Instead, copy them from the bottom layer and modify the layer and height.



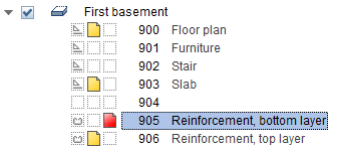
For internal use only

Use the following tool(s) to do this:

Function	How to activate it
 **Open on a Project-Specific Basis**	**Default** toolbar
 **Copy**	CTRL+C or **Edit** menu
 **Paste to Original Position**	CTRL+ALT+V or **Edit** menu
 **Modify Format Properties**	**Edit** toolbar
 **Filter by Reinforcing Bar Element**	**Filter Assistant** toolbar
 **Modify Placing Geometry**	**Repeat** menu
 **Rearrange Marks**	**Repeat** menu

For internal use only

Solution

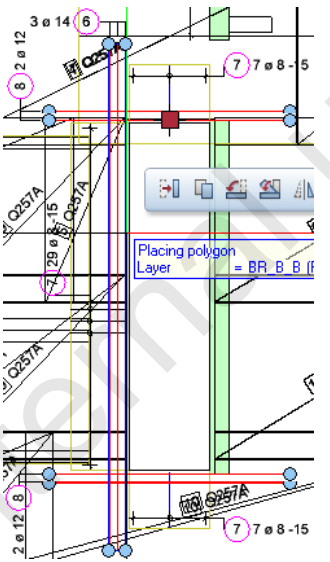


To create additional reinforcing bars

1 Open drawing file 905 in edit mode; leave the other settings as they are.

2 Press and hold down the SHIFT key and select all placing polygons of the additional reinforcing bars around the stair opening. Make sure that no tool is active!

The placements are displayed in the selection color. In addition, handles appear.



Important: make sure that you actually click the placing polygons. If you click an individual bar of a placement, you cannot modify the height later. Check the information provided by the ToolTips.

3 Press CTRL+C or click **Copy** (**Edit** menu).

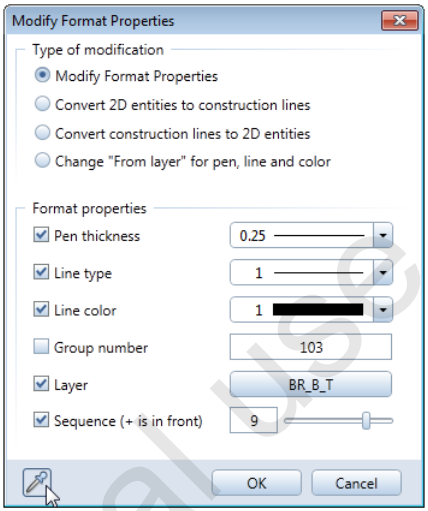
4 Press CTRL+ALT+V or click **Paste to Original Position** (**Edit** menu).

5 Close drawing file 905.

For internal use only

6 Click **Modify Format Properties** (**Edit** toolbar).

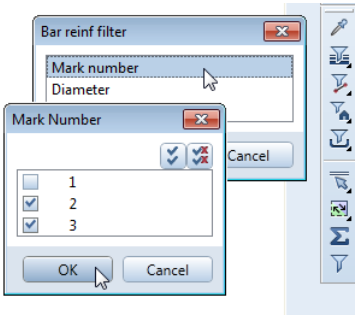
7 In the **Modify Format Properties** dialog box, click **Match parameters** and then click a reinforcing bar of the support reinforcement.



8 Clear the **Group number** check box and click **OK** to confirm.

9 Click **Filter by Reinforcing Bar Element** (**Filter Assistant** toolbar). In the **Bar reinf filter**, select **Mark number** and then the mark numbers
2 and **3**.

Tip: The selected filter condition is displayed in the dialog line.



10 Select the additional reinforcing bars you just copied by enclosing them in a selection rectangle.

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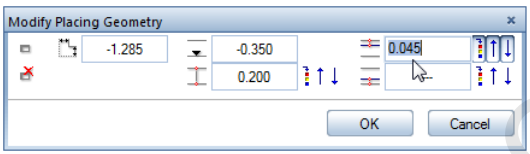
11 Click **Modify Placing Geometry** (**Repeat** menu) and then a bar of the vertical placement.

12 Click in the **Concrete cover at top** box.

The concrete cover at the bottom is entered for the concrete cover at the top.



13 Click **OK** to confirm the two context toolbars.

14 Change the height of the horizontal additional reinforcing bars in the same way.

15 If necessary, select **Rearrange Marks** (**Repeat** menu) and click **OK** to assign the same mark number to the horizontal reinforcing bars again.

A note on edge reinforcement with meshes

The **Edge Reinforcement** tool in the **Mesh Reinforcement** module is equivalent to the tool with the same name in the **Bar Reinforcement** module. The approach was described with the edge reinforcement around the opening for the stair. The procedure for selecting the mesh type and setting the parameters is the same as for the tools you have already used in the **Mesh Reinforcement** module. Consequently, this tool is not described any further here.

A special placing mode - excess mesh placement - can be used for edge reinforcement. To do this, create a reinforcing steel mesh cutting diagram that displays all meshes including the pieces of excess mesh. You can now click a left-over mesh and place it in its entirety or just parts of it. This method is described in more detail in the pages that follow.

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A note on rearranging identical marks

When working without layers, you can use the **Rearrange Marks** tool to combine marks of bars with identical diameter, steel grade, bending shape, bending pin and segment length. If you wish to combine meshes, make sure that the mesh type, dimensions and, if necessary, the bending shape and segment lengths are identical.

If all marks are in the same drawing file and several full schemas of the individual marks are available, a common full schema including the total number will be created for all combined marks. Partial schemas stay the same.
If the marks are in different drawing files, the full schemas are also retained and Allplan only combines the marks.

If you work with layers and the identical marks are on different layers, you can still include these marks as a common mark in the reinforcement management. For this Allplan provides the following options:

The marks for the bottom layer and the top layer are in different drawing files.

Combine the marks using the **Rearrange Marks** tool. The approach is the same as described for working without layers.
You can specify how the bottom and top reinforcement layers and/or the bar and mesh reinforcement are displayed using the settings controlling the visibility of layers (see following task). In addition, you can show and hide the bottom and top reinforcement layers by selecting the relevant drawing files.

The marks for the bottom layer and the top layer are in the same drawing file.

In this case, the **Rearrange Marks** tool does not combine the marks. You can still combine them as follows:
For example, change the layer status of the bottom reinforcement layer to **Visible, frozen** and use the **New Mark Number** tool to assign the same mark number as the one in the bottom layer to the corresponding mark in the top layer.
Please note that executing the **Rearrange Marks** tool will give identical marks differernt numbers again.

For internal use only

Task 6: display options provided by drawing files and layers

In the previous exercises you created the bottom and top reinforcement layers in different drawing files. This way, you can display the entire bottom and top slab reinforcement separately by selecting the relevant drawing files.

In addition, you can use layers to control how the reinforcement is displayed in the selected drawing files.
This way, you can even create the entire reinforcement in a single drawing file simply by placing the individual reinforcement elements (e.g. bottom layer, spacers, additional shear reinforcement, top layer etc.) on different layers. Moreover, you can always use the same shell to output the individual reinforcement elements to separate layouts. Allplan places the individual elements on top of one another.
When it comes to printing these layouts, you can use different print sets to which you assign the relevant layers. Using print sets was dealt with in unit 3, exercise 1, task 2.

To display reinforcing bars and meshes separately

➲ Drawing file 906 is current, and drawing files 900 and 903 are open in edit mode. All the other drawing files are closed.

1 Double-click in the workspace with the right mouse button.
The **Layer** dialog box appears.

2 If necessary, choose the **List existing layers in open documents** option and use the shortcut menu to set the entire **Mesh reinforcement** category to **Hidden, frozen**.

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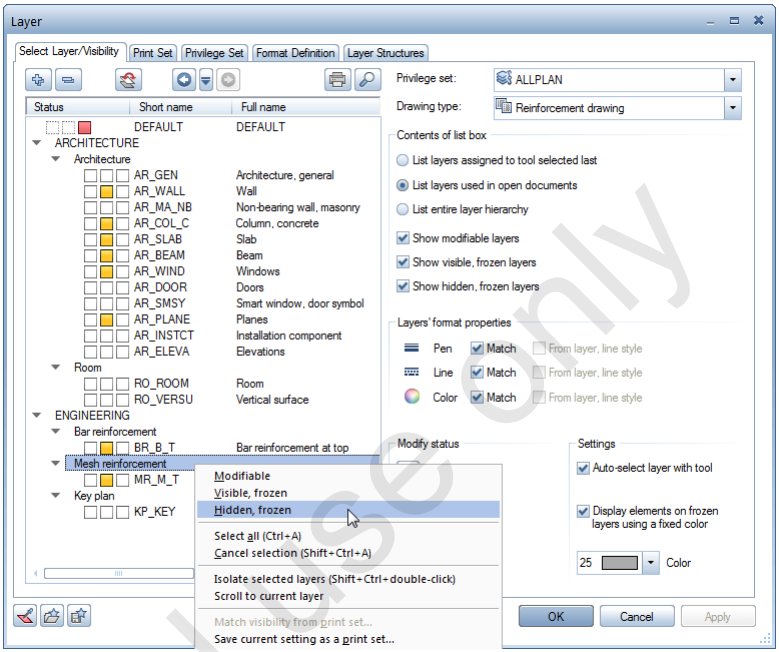
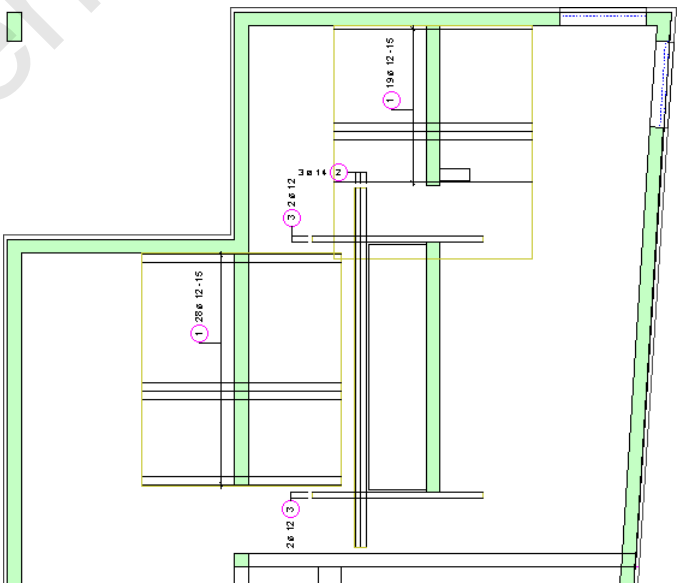


3 Click **OK** to confirm.

You should see the following on your screen.

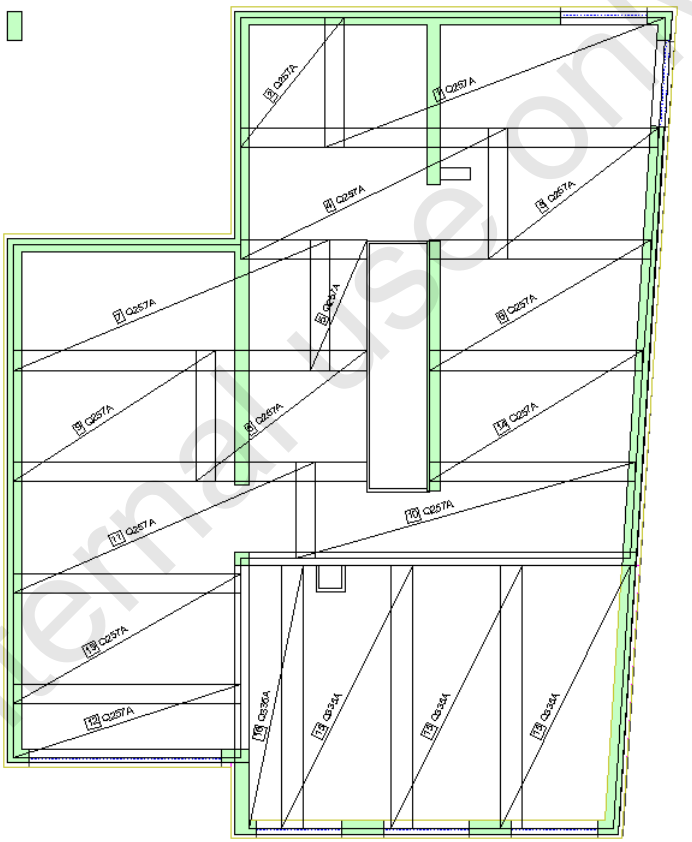


For internal use only

4 Double-click again in the workspace with the right mouse button.

5 Use the shortcut menu to set the entire **Mesh reinforcement** category back to **Modifiable** and set the entire **Bar reinforcement** category to **Hidden, frozen.**

You should see the following on your screen.



6 Double-click in the workspace with the right mouse button again and set the entire **Bar reinforcement** category back to **Modifiable** using the shortcut menu.

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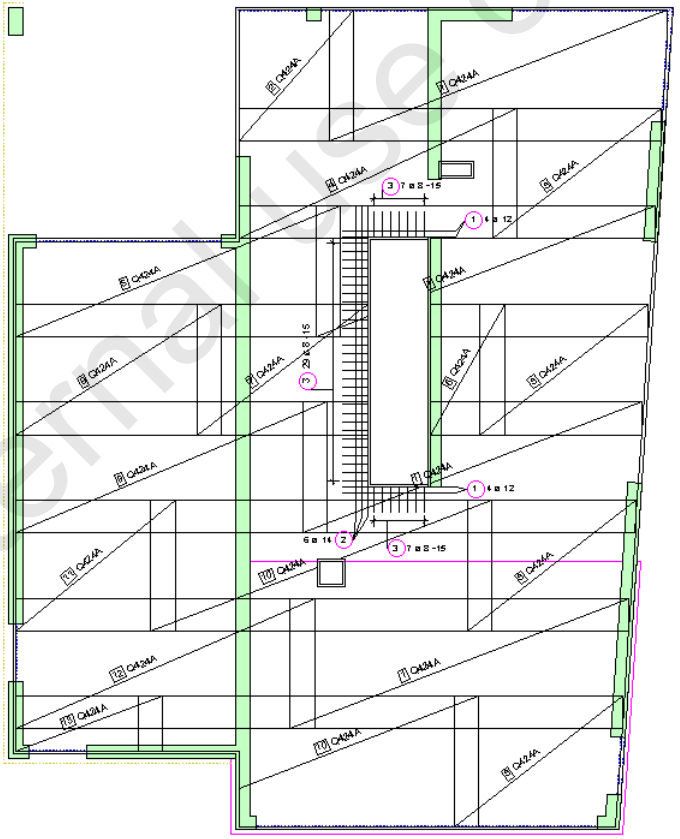
Exercise 5: slab above ground floor

This chapter shows how to create reinforcement as rationally as possible.



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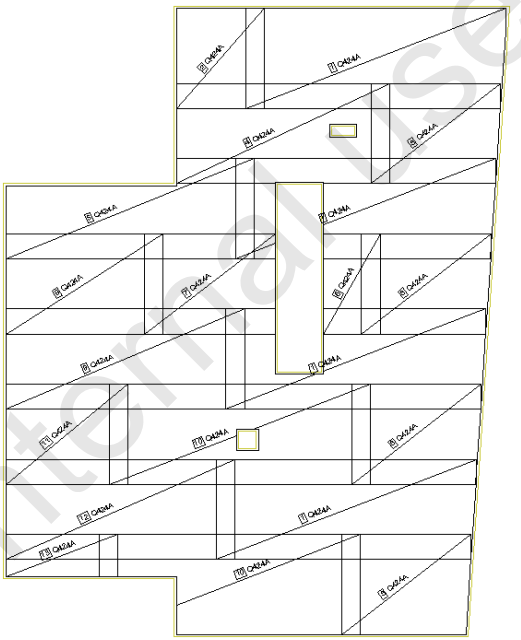
Task 1: creating span reinforcement using the outline auto-detect tool

Overview

Like the basement, the ground floor is delimited by a polyline. To define the shell, you will use the area detection feature, which is familiar to you from previous tasks. The recesses will also be taken into account.

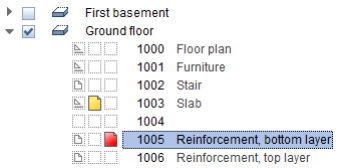


Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
Span Reinforcement	Wizard
Area detection	Dialog line

For internal use only

Solution



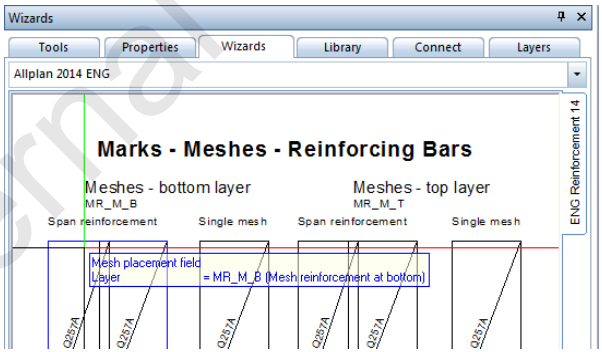
To create polygonal placement in span

1 Click **Open on a Project-Specific Basis** and open the **Ground floor** structural level in the building structure.

2 Make drawing file 1005 (**Reinforcement, bottom layer**) current and open drawing file 1003 (**Slab**) in edit mode. Deactivate the **First basement** structural level.
Close the dialog box.

3 Set the reference scale in the status bar to **1:50** and double-click in the workspace with the middle mouse button to display the full drawing.

4 Open the **Wizards** palette and double-click the span reinforcement under **Meshes - bottom layer** with the right mouse button.



The **Span Reinforcement** tool starts automatically. The layer MR_M_B should be set to current.

5 *From point or element or enter offset:* check that **Area detection** is selected in the dialog line (the icon is pressed in!), change the support depth to **-0.05** m and click inside the slab span.
Make sure that you do not click a point.

This selects the placing region.

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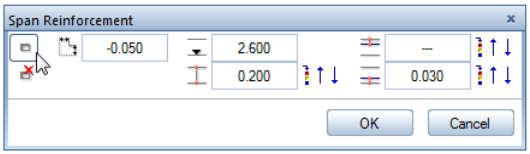
6 Define the height of the reinforcement (**Layer depth**, **Component thickness**, **Concrete cover at bottom**) and click **Enter opening**.



Tip: To avoid clicking a point, use **Zoom Section** to get a close-up view of the relevant section.

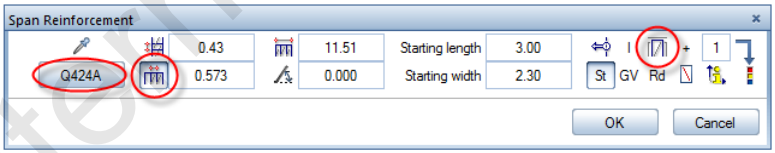
7 As with the mesh reinforcement for the basement slab, use **Area detection** to define all the recesses in the ground floor slab. Use an offset of **0.05**.

8 Press ESC to finish entering recesses and click **OK** to confirm the dialog box.

9 The dialog box for defining the placing parameters opens. Set the mesh type to **Q424A** and check that **Flush** is selected.

10 Click the **Transverse overlap** icon to place meshes of entire width only. Then click **OK** to confirm the settings.

Tip: When you click the **Longit. overlap** icon, only entire meshes or mesh sections (3/4, 2/3, 1/2, 1/3, 1/4) are placed in the longitudinal direction.



11 Press ESC to quit the tool.

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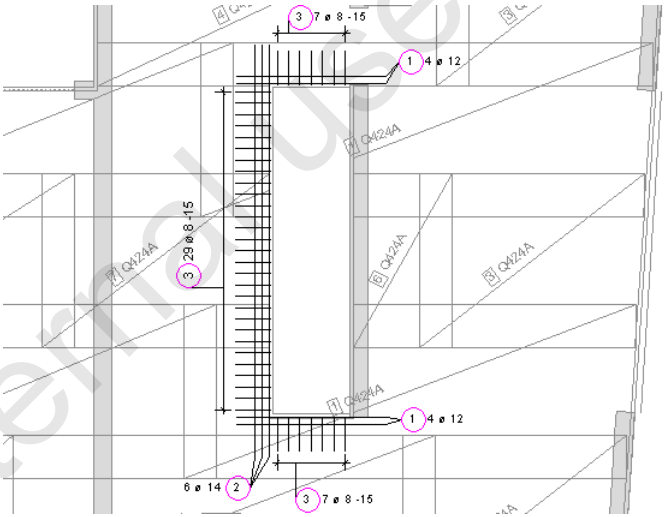
Task 2: reinforcement for the slab recess

Overview

For the basement, you created the additional reinforcing bars in the area around the stair opening using the **Additional Reinforcement** and **Edge Reinforcement** options for area reinforcement.
To create the edge reinforcement for the stair opening on the ground floor, you will use an **FF Component**.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
Select, Set Layers	**Format** toolbar
FF Components	**Bar Entry and Placement** flyout
Copy	**Edit** toolbar
Dimension Line, Label	**Display** flyout or wizard

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Solution

To create edge reinforcement

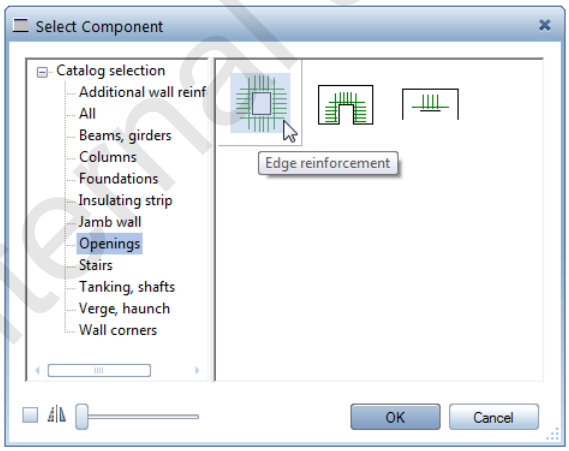
1 Open drawing file 1000 **Floor plan** in edit mode, too.

2 Double-click in the workspace with the right mouse button to open the **Layer** dialog box and set the layers **DL_GEN**, **DL_50** and **AR_WIND** to **Hidden, frozen**.

3 Click **FF Components** (**Bar Entry and Placement** flyout).

4 As you can use FF components to create both bars and meshes, this tool is associated with a general layer.
Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **BR_B**.

5 Select the **Edge reinforcement** component in the **Openings** catalog.



6 Set the global diameter to **8** and the global bar spacing to **0.15**.

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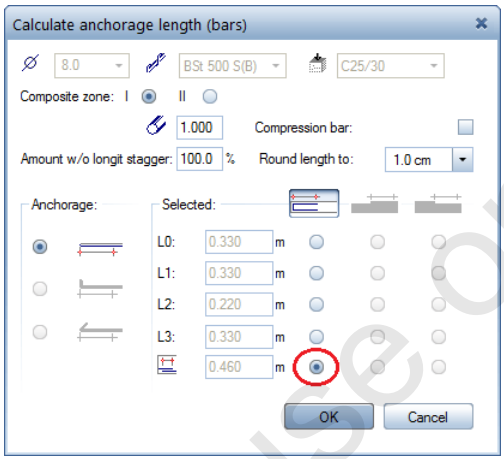
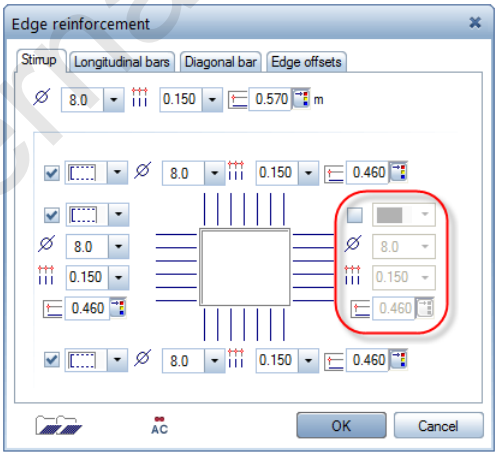
7 Click **Calculate anchorage length**, select the **Overlap length** option and click **OK** to confirm.



8 Select the **Open stirrup with segment length** for all sides. Deactivate the stirrup on the right.



9 Select the tab for the longitudinal bars and enter **12** for the global diameter. Click global anchorage length and select the **L0** option.

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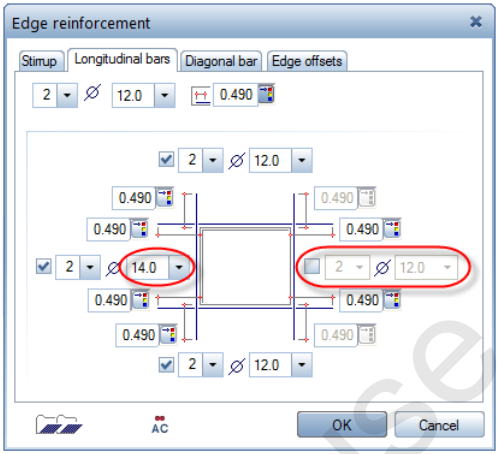
10 Change the diameter of the longitudinal reinforcement on the left to **14** and deactivate the longitudinal reinforcement on the right.

Tip: You can use the third tab to make settings for diagonal bars. This is not necessary here.

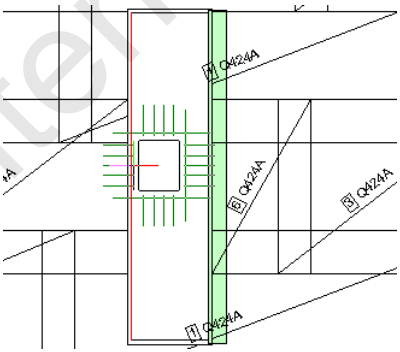
Use **Record management** to save component settings and retrieve them later.



11 Open the tab for defining the edge offsets, set the global concrete cover to **0.03** and click **OK** to confirm.

12 Point to the left edge of the slab opening until the reinforcement expands, then click in the workspace.

Tip: You can still alter the parameters of the component. Click the right mouse button after the reinforcement has expanded and select **Component dialog** on the shortcut menu.



The reinforcement expands automatically to adapt to the outline of the existing general arrangement. The lower edge of the adjacent wall and the upper edge of the slab are proposed as the placing region.

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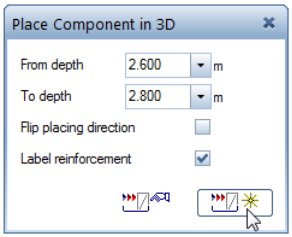
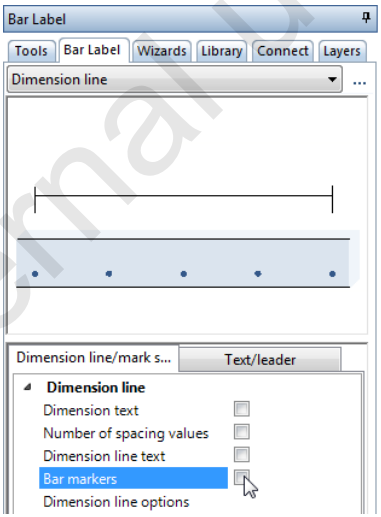
13 Click for **Placement depth from** and select **2.60**.

14 Activate the **Label reinforcement** option and click **Place automatically**.



15 Press ESC as you do not want to label the longitudinal reinforcement. Clear the **Bar markers** check box and place the dimension line and the label for the stirrups.



16 **Copy** (**Edit** toolbar) the longitudinal reinforcement (vertically 2x3 ∅ 14, horizontally 2x2 ∅ 12).

17 Use **Dimension Line, Label** (**Display** flyout) to create a common label for the longitudinal reinforcement.
Set the dimension line type to **Fan** and the aspect to **1.00**.

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Exercise 6: number-off management

Steel quantities can be output as a mesh cutting diagram, bending schedule or bar schema on the reinforcement drawing. In addition, the existing reinforcement can be output as steel schedules.
You can use the **Place Individually** tool to place any excess mesh.

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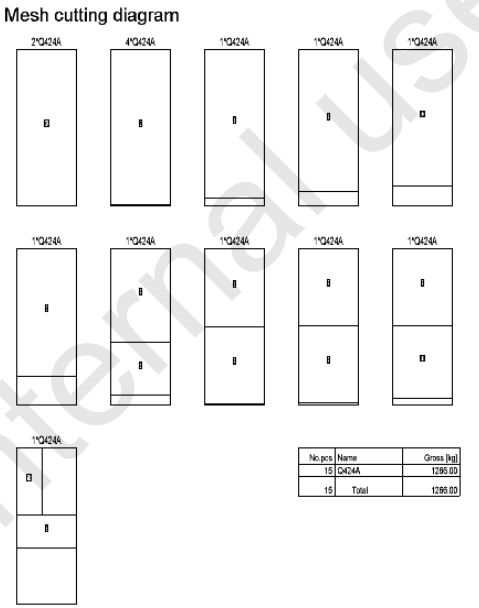
Task 1: cutting diagram

Overview

In Allplan, the cutting diagram illustrates the shape of the reinforcing steel meshes used for those on the construction site. To create the cutting diagram, a drawing file with reinforcing steel meshes must be current. If the reinforcing steel meshes to be included in the cutting diagram are located in different drawing files, open the other drawing files in edit mode. Meshes on visible but frozen layers are not included in the cutting diagram.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
Mesh Legend	**Reports** flyout

For internal use only

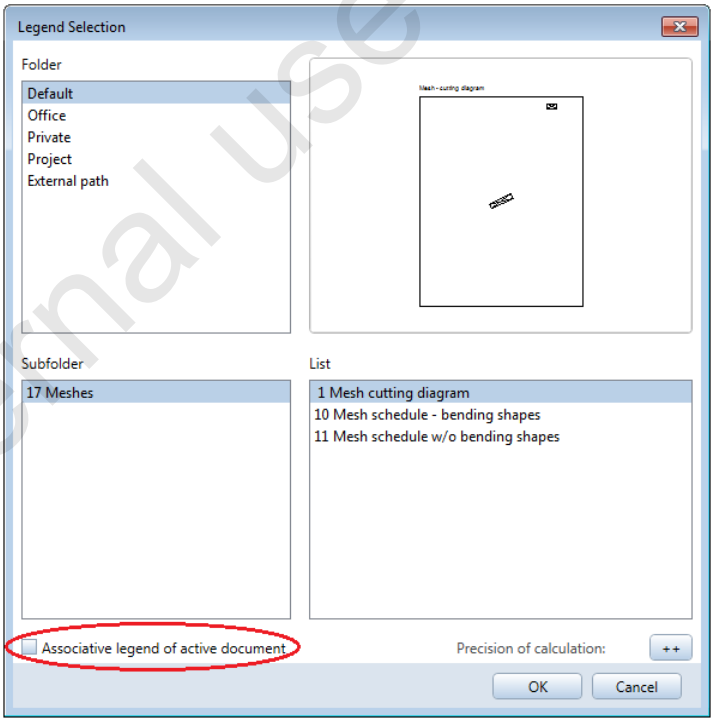
Solution

To create a cutting diagram

➲ Drawing file 1005 **Reinforcement, bottom layer** is current and drawing files 1000 and 1003 are open in edit mode.

1 Click **Mesh Legend** (**Reports** flyout).

2 In the **Legend Selection** dialog box, select the **Mesh cutting diagram** list type, clear the **Associative legend of active document** option as cutting diagrams cannot be created as associative legends and click **OK** to confirm.



Tip: If you want to print the mesh cutting diagram in addition to placing it in the drawing file, use the **Mesh cutting diagram** provided by the **Mesh Reports** tool.

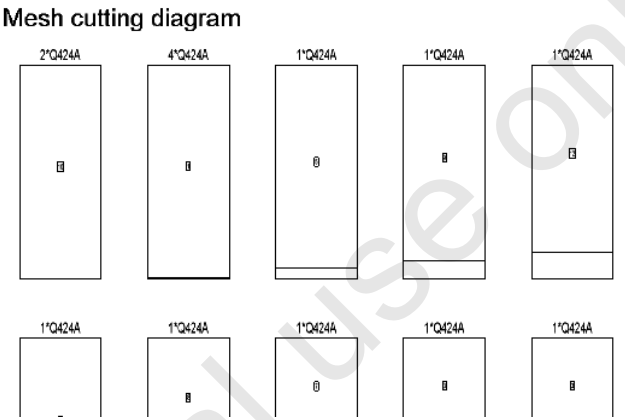
Note: If you do not clear the **Associative legend of active document** option, the program will issue a message indicating that the cutting diagram is created as a non-associative legend.

For internal use only

3 Click **All** in the input options.

The mesh cutting diagram is created and attached to the crosshairs.

4 Place the mesh cutting diagram in the drawing file.
A section of the diagram should now look like this:



A note on placing excess reinforcing steel mesh from cutting diagram

After you have created a cutting diagram in which the entire meshes are filtered out, you can see which excess pieces are left. You can click and then place these.

To place excess mesh

1 Click **Place Individually** (**Mesh Entry and Placement** flyout).

2 Check that the layer **MR_M_B** is current; if it isn't, select it on the **Format** menu or toolbar.

3 *Select view* Click within the floor plan, make settings for the height and click **OK** to confirm.

4 Click **Excess Mesh Placement** on the **Place Individually** Context toolbar.

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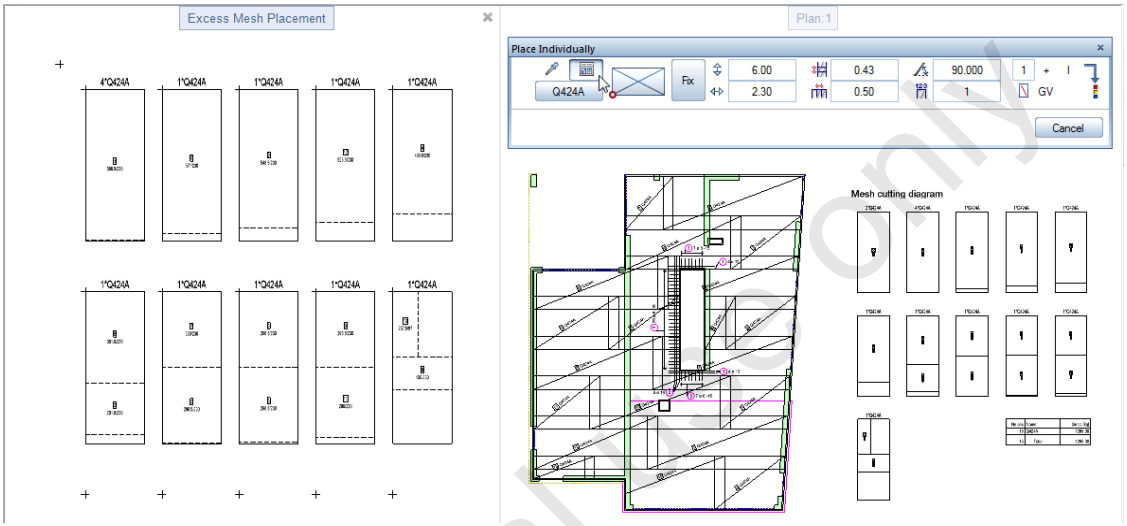
In addition to the current viewport, the **Excess Mesh Placement** window appears, which shows all the meshes with pieces of excess mesh as a cutting diagram.



5 In the cutting diagram, click the piece of excess reinforcing steel mesh that you want to place.

The **Excess Mesh Placement** window is closed again.

6 Place the piece of excess mesh. You can retain the dimensions of the reinforcing steel mesh copied automatically or reduce them.

7 To place more pieces of excess mesh, click **Excess Mesh Placement** again.

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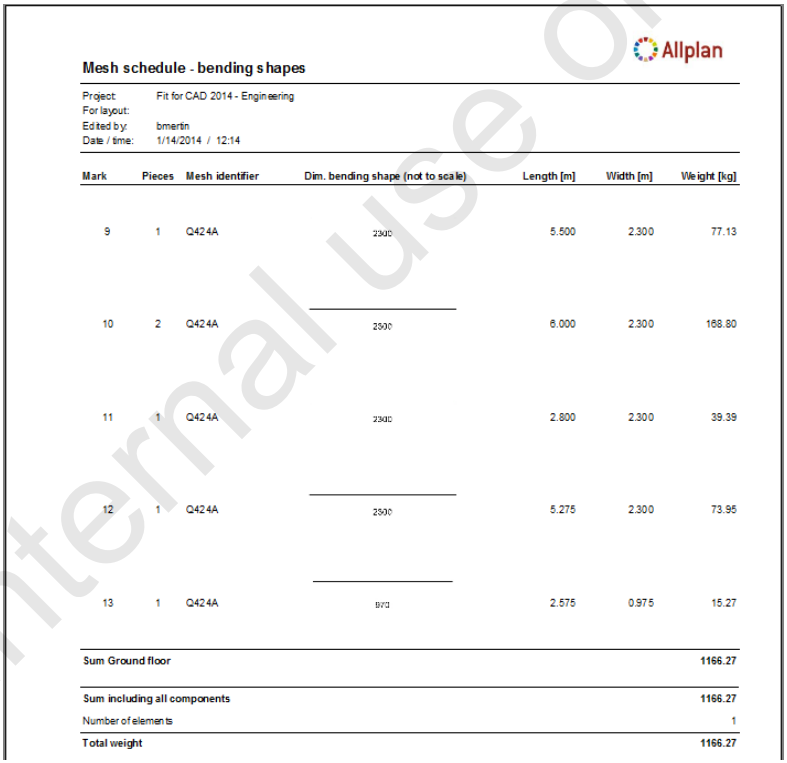
Task 2: mesh schedule

Overview

Like the bar schedule, the mesh schedule is created as you work and is thus always up-to-date. The amount of reinforcement placed can thus be output at any time.



Mesh schedule - bending shapes

Allplan

Project: Fit for CAD 2014 - Engineering
For layout:
Edited by: bmertin
Date / time: 1/14/2014 / 12:14

Mark	Pieces	Mesh identifier	Dim. bending shape (not to scale)	Length [m]	Width [m]	Weight [kg]
9	1	Q424A	2300	5.500	2.300	77.13
10	2	Q424A	2500	6.000	2.300	168.80
11	1	Q424A	2300	2.800	2.300	39.39
12	1	Q424A	2500	5.275	2.300	73.95
13	1	Q424A	975	2.575	0.975	15.27
Sum Ground floor						**1166.27**
Sum including all components						**1166.27**
Number of elements						1
Total weight						**1166.27**

Use the following tool(s) to do this:

Function	How to activate it
Mesh Reports	**Reports** flyout

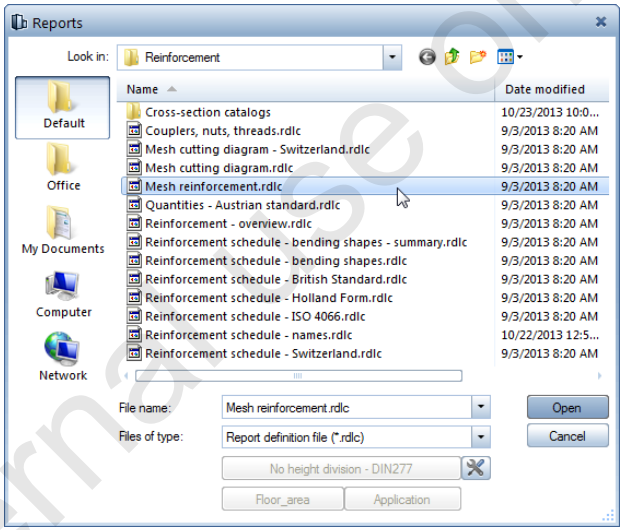
For internal use only

Solution

To create a mesh schedule

1 Click **Mesh Reports** (**Reports** flyout).

2 The **Reports** dialog box opens. If necessary, click the **Default** folder on the left and select the report called **Mesh reinforcement**.



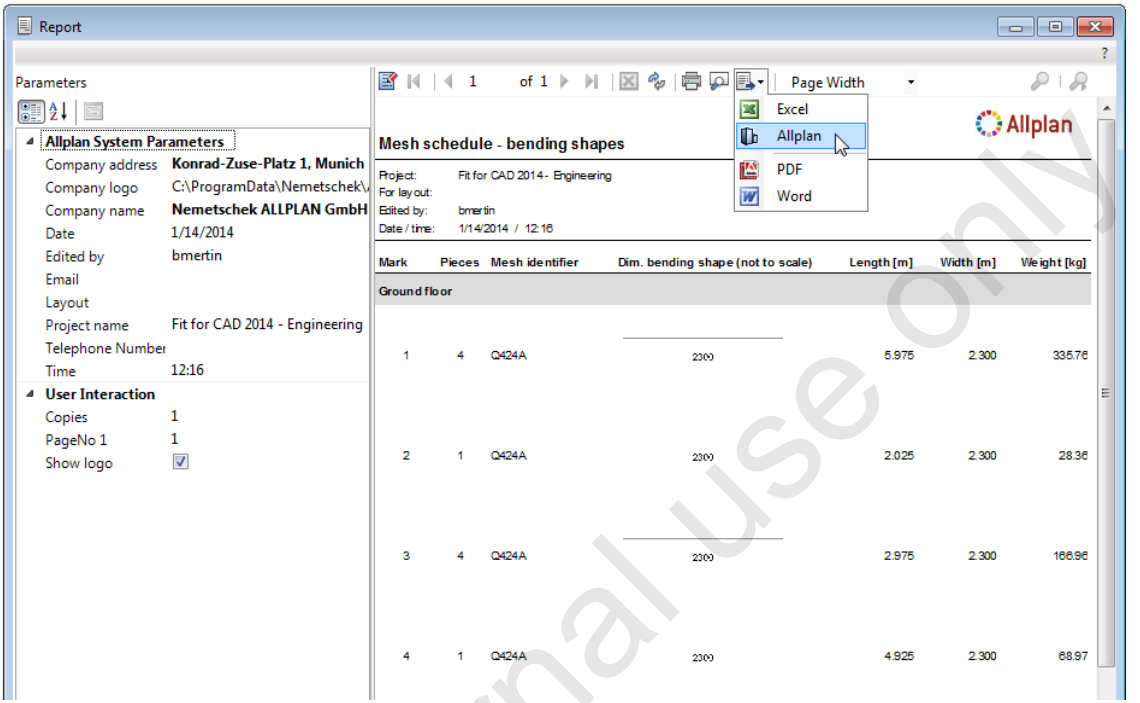
3 Click **All** in the input options to include all the marks.

The report is displayed in the Report Viewer.

Tip: Click the dimensioned bending shapes in the **Report Viewer** in **editing mode** to modify them in the workspace.

For internal use only

4 Define the desired parameters.



5 Click **Export** and select **Allplan** if you want to place the mesh schedule in the drawing file.

6 You can also **Print** the report or select one of the other options provided by **Export**.

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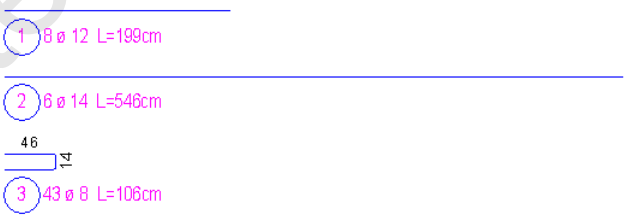
Task 3: bar schema

Introduction

The **Partial** and **Full Schema** tools provide a way of displaying the internal number-off and bending shape management in the reinforcement drawing. You can place a schema bar and label for every mark in the drawing file. The schema will automatically update to reflect any changes you make to the placed reinforcement or bending shapes. Allplan also provides a number of different display options here that you can configure to suit your own needs and requirements. You can choose from the following options:

- You can select between 'full schemas' (number off information on all the placements of a mark) and a 'partial schema' (number off information on several placements of a mark).
- The bending shape can be drawn to scale or not (only for bar reinforcement).
- The bending shape can be rotated and mirrored prior to being placed.
- The bending shape can be displayed so that it is aligned with the placement.



Use the following tool(s) to do this:

Function	How to activate it
Full Schema	**Display** flyout

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Solution

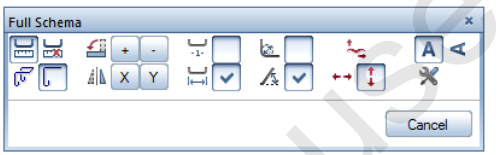
To create full schemas of the bar reinforcement

➲ Drawing file 1005 **Reinforcement, bottom layer** is current and drawing files 1000 and 1003 are open in edit mode.

1 Click **Full Schema** (**Display** flyout).

2 In the input options, click **Rebars** and, in the dialog line, enter the number of the mark based on which a schema is to be created or click the mark.
Start with mark number **1**.

Tip: Click **Schema Label Settings** to set parameters for the schemas' labels and dimension lines.



3 Enter the settings as shown above and confirm.

4 The schema and its label are attached to the crosshairs. Place the schema below the floor plan.

5 You should be able to create the other bar schemas yourself:

- The **+** / **-** icons of the **Rotate** option let you rotate the bars by 90°. In addition, you can use **X** / **Y** of the **Mirror** option to mirror the bars about the x/y axis.
- For straight bars, you can switch off **Segment dimensioning**.
- Set the text angle so that it matches the position of the bar shape.

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A note on positioning schema labels

Allplan always creates horizontal or vertical schema labels, regardless of the position of the bar.

In the case of sloping floor plans, you can place the bar schemas in a block and rotate them later. If you align the schemas, you can also rotate the schema labels.

To do this, select the **Edit Text** tool, click the relevant schema label and specify the text angle and position in a single step.

A note on the differences between full and partial schemas

Like steel schedules, full schemas always output the entire internal number off data of a mark. Consequently, to create a full schema, you can enter a mark number in the dialog line or click a bar or mesh. The full schema will update automatically to reflect any changes you make to a placement or to the mark's bending shape.

Partial schemas only output the number off data of the placements you have selected. Therefore you cannot create a partial schema by entering a mark number in the dialog line. Number off data in partial schemas only changes when you change it in the associated placements. Partial schemas are suitable for displaying schemas of individual components.

If you work with shell views on a cross-file basis and create the reinforcement model in a separate drawing file, Allplan always creates the full schemas in the drawing file with the associated reinforcement model. Partial schemas, on the other hand, are always created in the drawing file with the placement clicked.

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Unit 5

For internal use only

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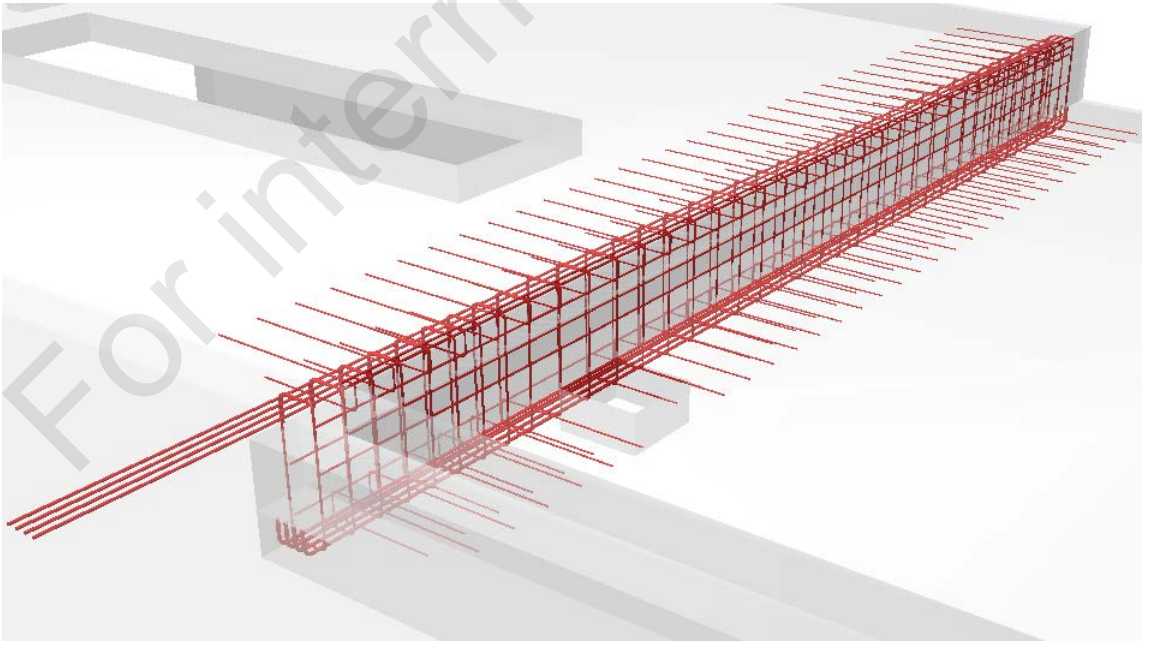
Exercise 1: beam reinforcement

You will start by creating an additional structural level on the right-hand side of the building structure. This structural level will be used for the general arrangement and reinforcement of the horizontal beam.
Thanks to this clear structure - the left-hand part of the building structure shows the floor plans and area reinforcement and the right-hand part provides the objects derived such as beams, columns, foundations and so on - all employees involved in the project will quickly find their way around.

Next you will create the required sections using the **Associative Views** module. Based on these views and sections, you will reinforce the beam in this exercise. The column will be reinforced in a subsequent exercise.



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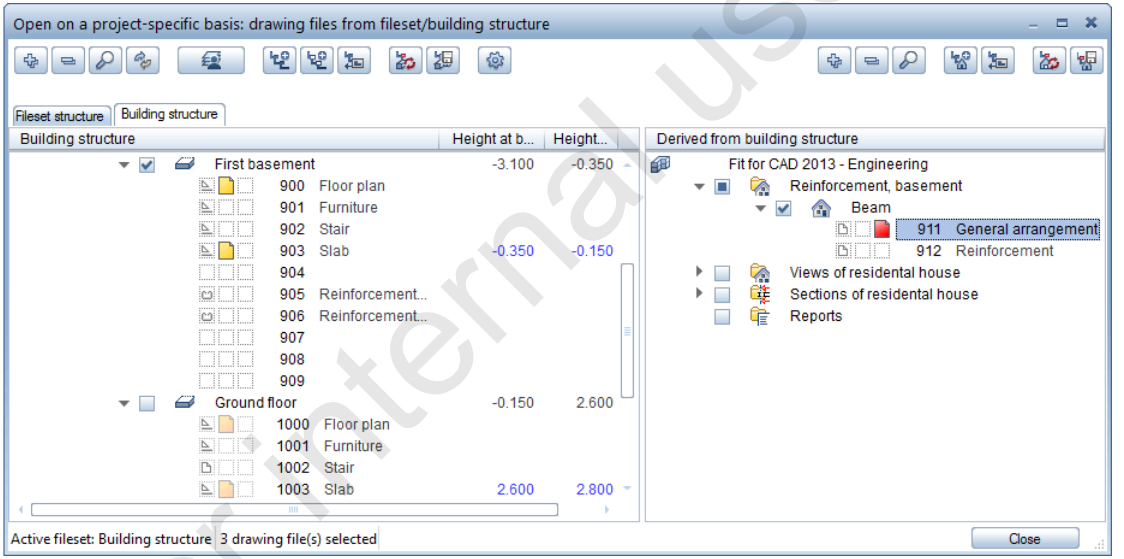
Task 1: creating a new structural level in the right-hand part of the building structure

Overview

Create the **Reinforcement, basement** folder with a subfolder for the **Beam** component in the right-hand part of the building structure. Assign a drawing file for the general arrangement and a drawing file for the reinforcement and name the two drawing files.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar

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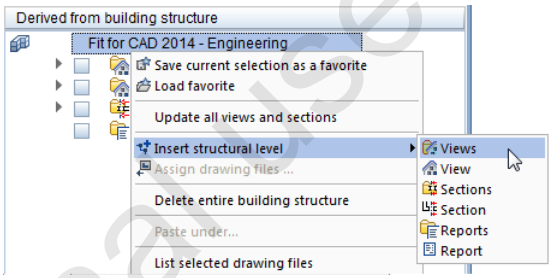
Solution

To add new objects derived from the building structure

1 Click **Open on a Project-Specific Basis** and deactivate the **Ground floor** structural level in the building structure.

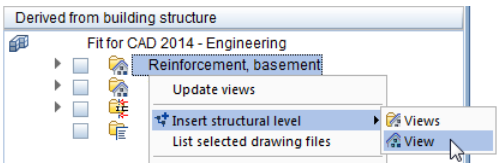
2 Select the **First basement** structural level and open drawing files **900 Ground floor** and **903 Slab** in edit mode.

3 In the **Derived from building structure** area on the right, open the project's shortcut menu, point to **Insert structural level** and click **Views**.



4 Open the shortcut menu of the new structural level and select **Rename**.
Enter **Reinforcement, basement** for the name and press ENTER to confirm.

5 Now open the shortcut menu of the renamed structural level again, point to **Insert structural level** and click **View**.



6 Rename the new structural level **Beam**.

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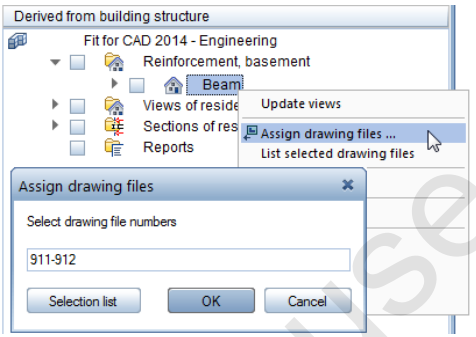
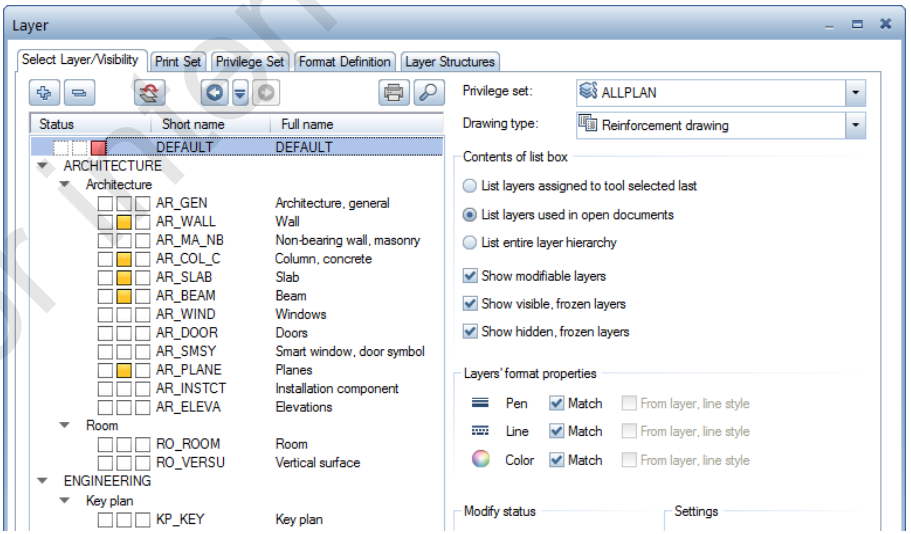
7 Open the shortcut menu of the **Beam** structural level, select **Assign drawing files...**, assign drawing files 911 and 912 and name them as follows:

Drawing file 911 **General arrangement**
Drawing file 912 **Reinforcement**



8 Select the **First basement** structural level, make drawing file 911 current and **Close** the dialog box.

9 Check the layer settings.



For internal use only

Task 2: shell for beam

Introduction

You can use the tools in the **Associative Views** module to create clipping paths and views. These form the basis for the reinforcement drawing later.

At first glance, associative views and sections would appear to be no different from 2D data. However, they are derived from a three-dimensional model and are therefore inherently linked with this model.
The component displayed will automatically update to reflect any modifications you make to the 3D component or in a view or section. If, for example, you move an opening in the front elevation or insert it in the floor plan later, the 3D component and all associative views and sections of your general arrangement drawing will adapt automatically. You can also make modifications in isometric views.

Placing reinforcement has an immediate and direct effect on the three-dimensional model and consequently on all the other views and sections. For this reason you can use a filter to define the scope of the elements to be displayed.
You can specify whether all elements, the shell, the shell and the reinforcement or the shell and the fixtures is/are displayed in the view or section.

To create reinforcement, at least two orthogonal views or sections are required. You can create any number of additional sections by deriving them from the three-dimensional model. Depending on the setting of the display filter, the relevant reinforcement is displayed automatically and can be labeled immediately.

Sections are different to views in that they have a spatially delimited depth. This delimitation is defined using two clipping lines.

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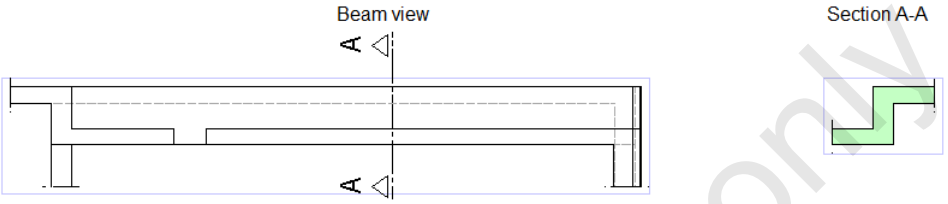
Overview

To reinforce the beam, you require a view of the beam as well as a section at midspan.



Use the following tool(s) to do this:

Function	How to activate it
Select, Set Layers	**Format** menu
Options	**Default** toolbar
Create View	**Tools** palette, **Create** area
Create Section	Shortcut menu
Move	**Edit** toolbar
Convert View to Section	Shortcut menu
Modify View and Section Properties	Shortcut menu
Open on a Project-Specific Basis	Double-click the left mouse button

For internal use only

Solution

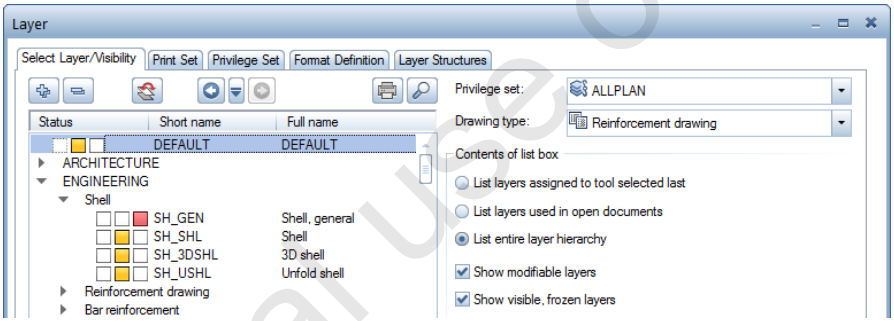
To set general defaults and options

Tip: Click at top left to close the entire tree structure.

You can also open the **Layer** dialog box by clicking **Expand** at bottom right in the **Layers** palette.

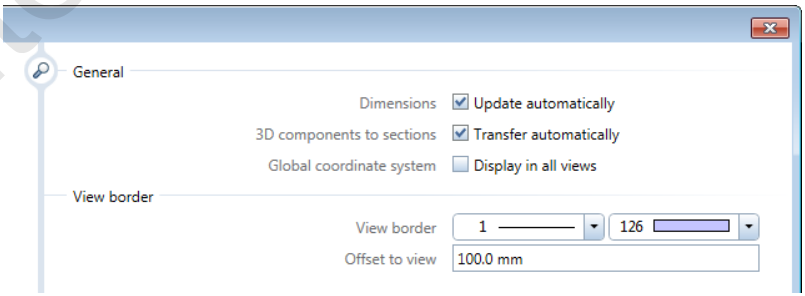
1 Click the reference scale in the status bar and select **1:50**. Check the current unit of length and set it to **m**, if necessary.

2 Click **Select, Set Layers** on the **Format** menu, select the **List entire layer hierarchy** option and set the SH_GEN layer (ENGINEERING category - **Shell** folder) to **Current**.



3 Click **Options** (**Default** toolbar) and then **Associative views**.

4 Check that the **Automatically transfer 3D components to sections** option is selected. If it isn't, select it.



5 Check the other settings and click **OK** to confirm the dialog box.

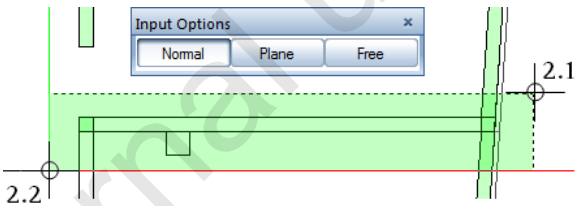
For internal use only

To create the front view

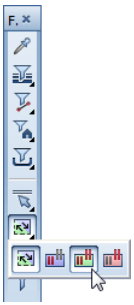
1 Open the **Tools** palette, select the **Engineering Views, Details** module and click **Create View** in the **Create** area.

The layer set on the **Format** toolbar is used for the label. You cannot select a different layer. The layer for the view or section is taken from the 3D components. You can also specify it in the dialog boxes for hidden line images and sections.

2 *Select 3D elements of which you want to create a view:* press and hold down the left mouse button and enclose the beam, column and exterior wall in a selection rectangle, which you open from right to left. This selects all elements that are fully bounded and intersected (**Select Elements based on Direction** is active in the **Filter Assistant**: the selection rectangle is shown as dashed lines, and the area it covers is highlighted in light green).



Tip: Alternatively, open the **Filter Assistant** and click **Select elements fully bounded and intersected by selection window**.



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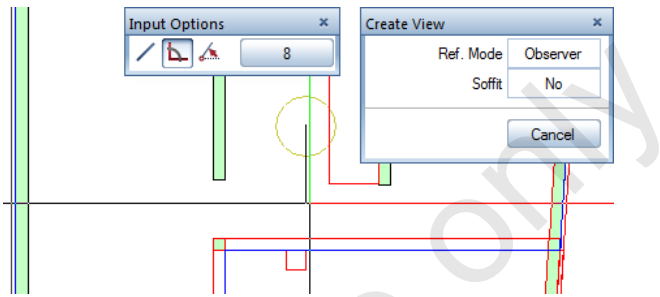
3 *Select viewing direction:* do not change the settings on the context toolbar and define the viewing direction by clicking below the circle displayed on your screen.

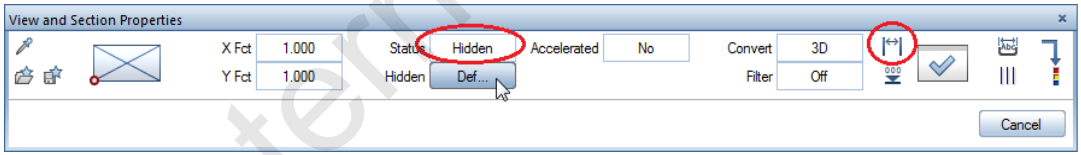
Tip: As the reference mode is set to **Observer**, the view is created so that horizontal component edges are parallel to the global x axis. In other words, horizontal edges are always horizontal, regardless of the viewing direction set. The **Folded** mode, on the other hand, displays the view as folded.



The **View and Section Properties** Context toolbar opens and the view is attached to the crosshairs.

4 The **Status** box is set to **Hidden**. If it isn't, click the box to switch to the hidden line image.

5 On the **View and Section Properties** Context toolbar, click **Dimension Line** to switch off dimensioning.



6 Click the **Def...** button. In the **Settings for Hidden Line Images** dialog box, check that the **Display visible edges** and **Display hidden edges** options are selected, set the format properties as shown below and click **OK** to confirm the dialog box.

- Visible edges:
  Pen **0.35** mm; do not change the line and color; layer **SH_SHL**
- Hidden edges:
  Do not change the pen, line and color; layer **SH_SHL**

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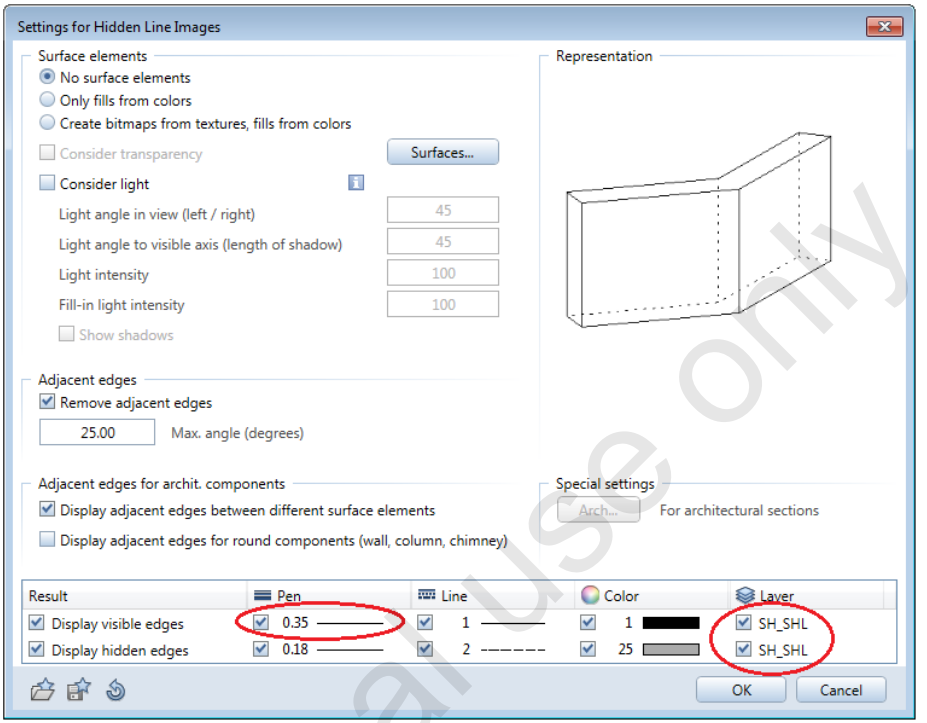

7 *To point or angle of rotation:* place the view below the floor plan.

8 Enter the label for the view in the dialog line and press ENTER to confirm.

9 Specify the label's parameters (text height and width: **3.5** mm), place the label and press ESC to quit the tool.

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Next, you will create the cross-section based on the view you just created.

To create the section

1 Click the view border with the right mouse button and select  **Create Section** on the shortcut menu.

2 *Select 3D elements of which you want to create a section:* select the entire view you just created by enclosing it in a selection rectangle. Alternatively, click the view border.

3 *Select viewing direction:* define the viewing direction by clicking to the right of the circle displayed on your screen with the crosshairs. This has the effect that the 3D elements are viewed from the right when the section is calculated.

4 *From point - To point*: click the two diagonal points at midspan in the view you just created and press ESC to finish entering the polyline.

The **View and Section Properties** Context toolbar is displayed and the section is attached to the crosshairs.

5 Click  **Section settings for associative view** beside  and make the following settings in the **Section** dialog box:

- Check the settings shown below in the **Display of clipping path** area.
- In the **Section display** area, select **Apply thick line around intersected components** and then **Exterior edges**.
- Select the **SH_GEN** layer for all linear elements that are displayed.
- In the **Label** area, click **Text parameters...**, set the text height to **5.0** mm and the text width to **4.0** mm. Then click **OK** to confirm the **Text Parameters** dialog box.
  Enter A for the section identifier.
- In the **Section object** area, select the **Display section object (as construction lines)** option and click **OK** to confirm the dialog box.

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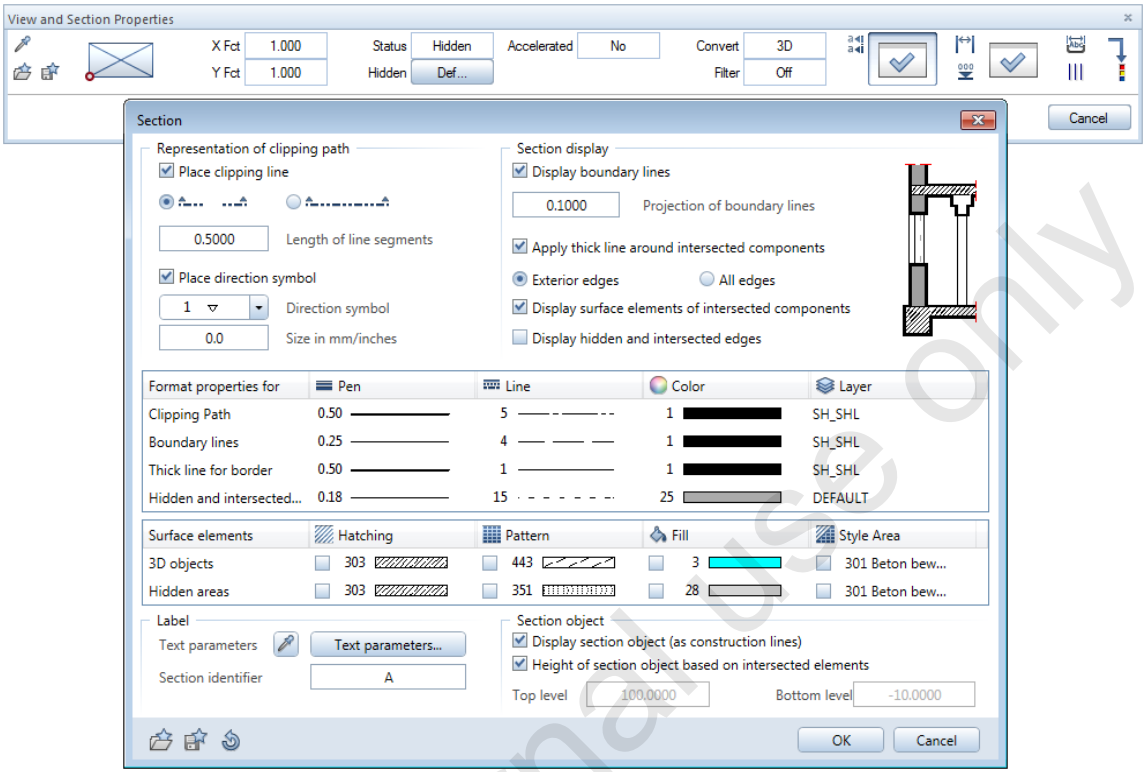

Tip: Track tracing helps you place points in exact alignment with existing points. You can press the **F11** key or click in the dialog line to quickly switch track tracing on and off.

6 *To point or angle of rotation:* place the section so that it is to the right of and aligned to the view you created beforehand.

7 *From point*: define the area in the new section so that the slab connections are displayed.

8 Confirm the section identifier and place it above the section.

9 If necessary, click **Move** (shortcut menu or **Edit** toolbar) to move the section.

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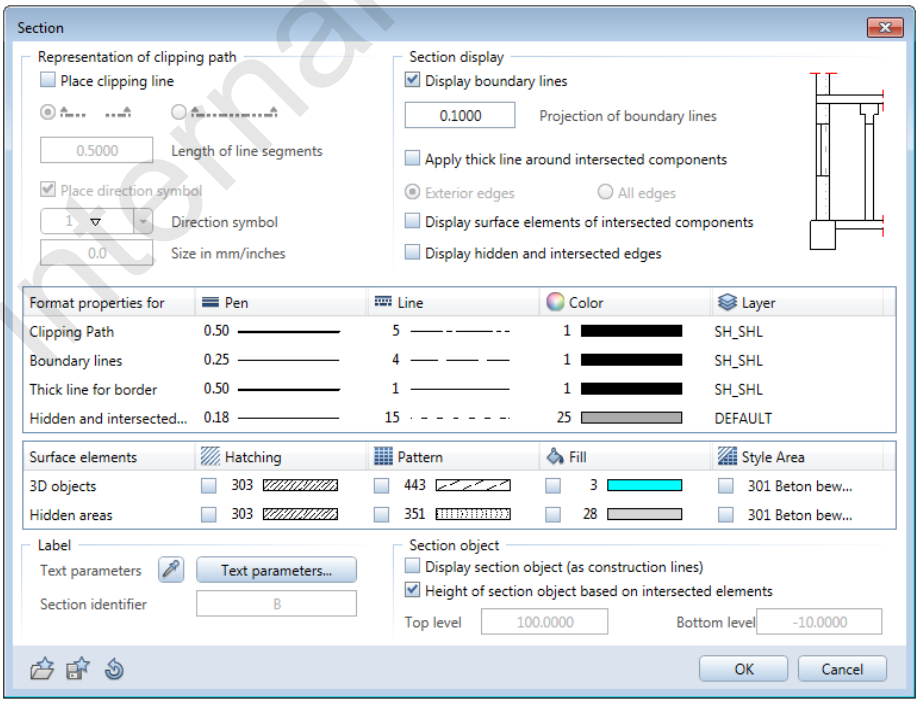
In the exercise that follows, you will reinforce only the beam. The column will be reinforced in a subsequent exercise.
The outermost corner is visible when you look at the right support area at the inclined exterior wall. This is not useful when it comes to reinforcing the beam. You will therefore adjust the view.

To adjust the view

1 Click the view border with the right mouse button and select **Convert View to Section** on the shortcut menu to convert the beam view to a section.

2 Click **Show Clipping Path** and clear the check boxes for **Place clipping line**, **Display surface elements of intersected components** and **Display section object (as construction lines)**.

3 In the **Section display** area, check that **Display boundary lines** is active and that **Apply thick line around intersected components** is not active. Select the **SH_GEN** layer for the **Boundary line** and the **Thick border**.



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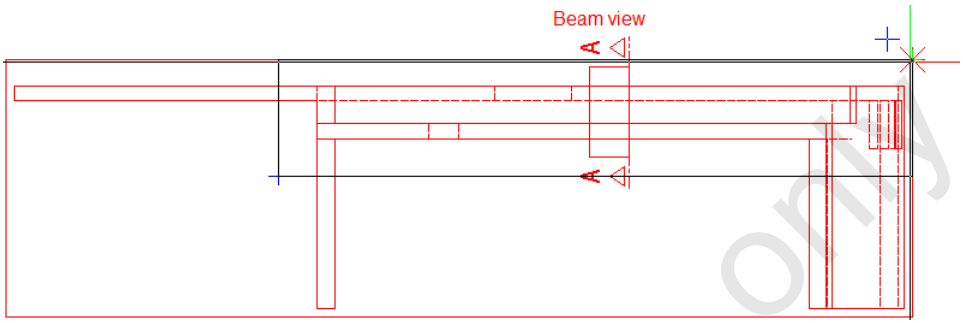
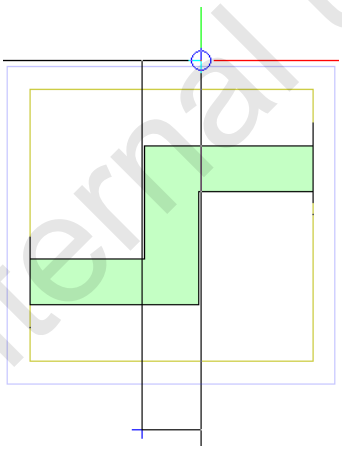
4 In the view, define the first clipping area so that only the connections of the column, slab and exterior wall are displayed.



5 In the section, define the second clipping area so that the section ends just beside the beam. Do not reduce the height of the clipping area.

Tip: Snap to the existing points and enter exact values in the data entry boxes that are highlighted in yellow in the dialog line.



6 Skip the prompt for the label by pressing ESC. Allplan retains the original label.

7 Press ESC to quit the tool.

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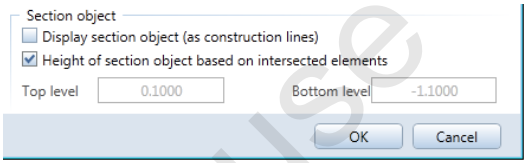
Finally, you will hide the section objects.

To hide section objects

1 Click the view border of section A-A with the right mouse button and select **Modify View and Section Properties** on the shortcut menu.

2 On the **View and Section Properties** Context toolbar, click **Section settings for associative view** and clear the **Display section object (as construction lines)** check box. Then click **OK** to confirm the dialog box.

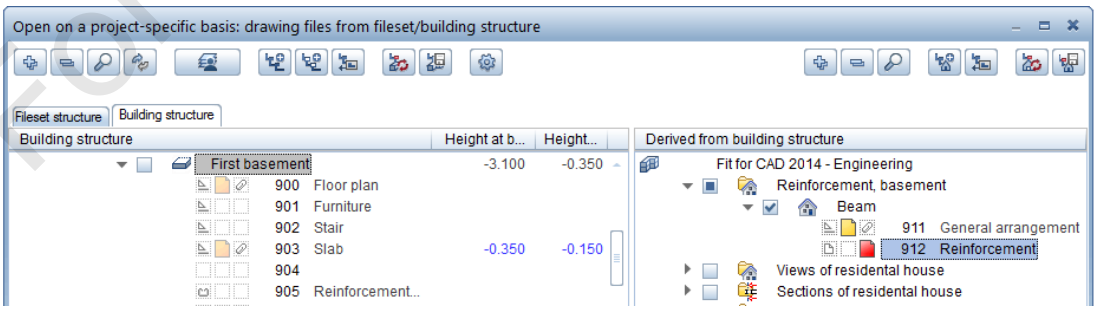


3 Click **Apply** to confirm the **View and Section Properties** Context toolbar and press ESC to quit the tool.

4 Define the **DEFAULT** layer as the current one.

5 Double-click in the workspace with the left mouse button. The dialog box for selecting drawing files and filesets opens.

6 Deactivate the **First basement** structural level in the building structure on the left-hand side of the dialog box. Then move to the **Derived from building structure** area on the right-hand side, make drawing file **912 Reinforcement** current and **Close** the dialog box.



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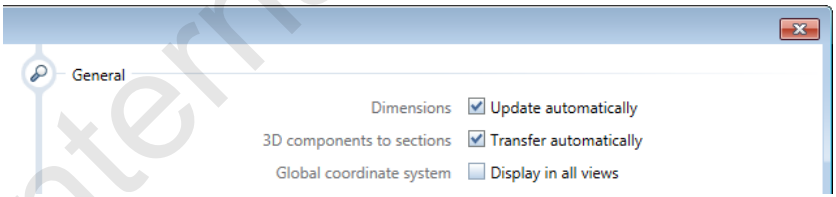
A note on display parameters of views and sections

When you create views and sections with hidden edges being visible, the lines (line width, line type, line color) are displayed in accordance with the settings you make in the dialog boxes for hidden line images and sections.
If the format properties of **visible edges** are not selected for views and sections with hidden edges being visible or if you choose to display these views and sections as wireframe models, the lines are displayed in accordance with the format properties of the 3D elements. You can use the **Modify Format Properties in View** tool to modify the manner in which the lines are displayed for views converted to 2D (unless the fixed setting for matching the layers' format properties is selected).

A note on adding 3D elements to sections later

In the **Options (Default** toolbar), **Associative views**, you can configure Allplan to automatically add new 3D elements to existing sections. In this case, **Automatically transfer 3D components to sections** must be selected, which is the default setting.



Note that 3D components are only transferred to sections that are in the current document or in drawing files open in edit mode. In addition, the program only integrates the 3D components that are created in the clipping area. Please note that this does not apply to views. New 3D components are never added automatically to views.

If this option is not active, you can use the **Add to View** tool to add new 3D components to existing views and sections.
You can use the **Remove from View** tool to delete these 3D components from views and sections again at any time.

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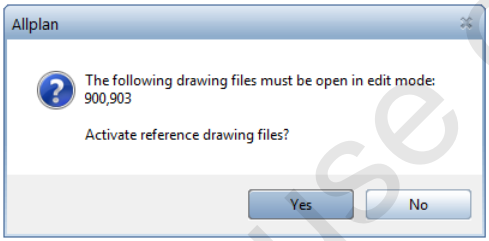
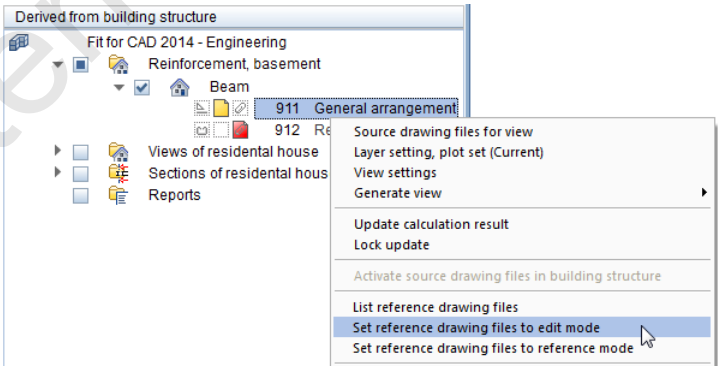
A note on displaying and selecting reference drawing files

Associative views and sections are always created across drawing files. If you do not create the views and sections in the drawing file with the associated 3D elements, Allplan will create references to the drawing files with the 3D elements.

When you are modifying views and sections and not all drawing files with associated 3D elements are open in edit mode, you will see the following message:



In this case, click **Yes** or open the dialog box for selecting filesets and drawing files and use the shortcut menu to open the necessary reference drawing files in edit or reference mode. You can also list the reference drawing files for information purposes only.



Note: Drawing files with references are indicated by . The shortcut menu of drawing files without references does not include options for reference drawing files or they are grayed out and unavailable.

You can also use the **Display Drawing File References** tool to open a window providing information on reference drawing files of

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views and sections created across drawing files.
If the view or section and the 3D elements are in the same drawing file, a message appears announcing that there are no reference drawing files.

A note on working without references

If a current building model is irrelevant, you can work without references. In this case, it is essential that you create all the data in the same drawing file.

Tip: When you work with a 2D general arrangement drawing, Allplan always creates the 3D model and the reinforcement views in the current drawing file.

If the 3D elements are spread over several drawing files or if they are to serve as the basis for several layouts, you first need to copy the required section of the floor plan to an empty drawing file using  **Copy, Convert Elements Across Drawing Files** so that you can create the general arrangement drawings and the reinforcement drawings. After this, you can generate the required sections using the tools in the **Associative Views** module.

As the model data is copied, the workflow is not interrupted even if you are working in a workgroup environment. This produces versions of the general arrangement and reinforcement data as well as ensures that the building model is not changed inadvertently. Before you create the final layout, it is a good idea to check the building data and to update it, if necessary.

Note: Regardless of whether you work with or without drawing file references, you always use the same settings in the  **Options**. As long as you create all the data in the same drawing file, Allplan will not produce any drawing file references.
Make sure that copying or moving the data does not result in undesired references.

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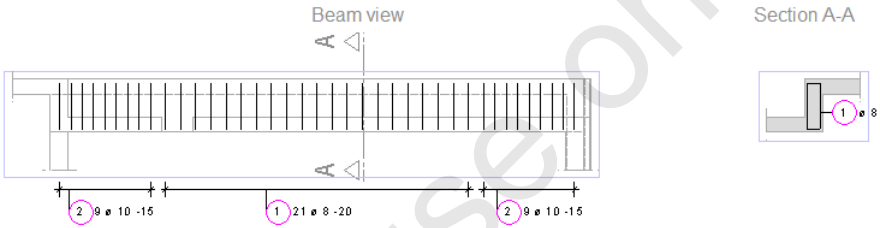
Task 3: stirrup reinforcement

Overview

You will start by placing the stirrup reinforcement for the entire beam. After this, you will modify the placement at the supports.



Use the following tool(s) to do this:

Function	How to activate it
Bar Shape	**Bar Entry and Placement** flyout
Select, Set Layers	**Format** toolbar
Place Bar Shape	Shortcut menu
New Mark Number	**Engineering Modify** flyout
Modify Mark	**Properties** palette
Modify Placement	**Properties** palette
Rearrange Marks	Shortcut menu
Label	Shortcut menu
Dimension Line, Label	Shortcut menu

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Solution

You will use the **Engineering** toolbar to enter the first reinforcement element. You can then select the subsequent tools using the shortcut menu.

To create expanding stirrup reinforcement

➲ Drawing file **912** is current, drawing file **911** with the sections for the beam is open in edit mode. All the other drawing files are closed. Open the **Options**, **Reinforcement** page, and check that the **Reinforce with 3D model** option is active.

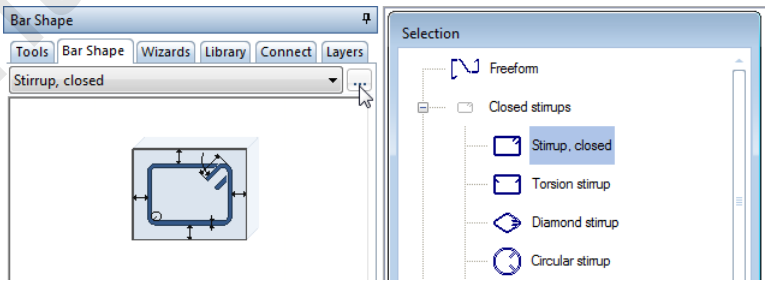
1 Check that the reference scale in the status bar is set to **1:50**.

2 Click **Bar Shape** (**Bar Entry and Placement** flyout), open the **Bar Shape** palette and click in the title bar to make sure that the palette is visible while the tool is active.

3 Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **BR_B**.

4 In the **Bar Shape** palette, the **Freeform** bending shape is active by default. You can use it to create any bending shape. Click the button above the graphics and select **Stirrup, closed** in the list box.

Click ... to open a dialog box that displays all the bending shapes graphically in groups.



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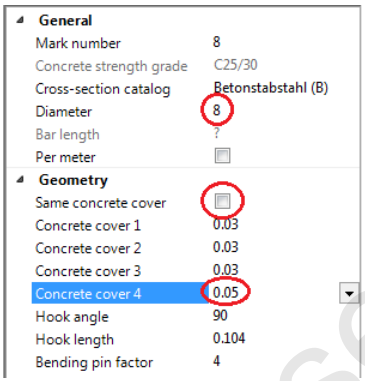
5 Select diameter **8** in the parameter area of the palette, clear the **Same concrete covers** check box and change the value for **Concrete cover 4** to **0.05**.

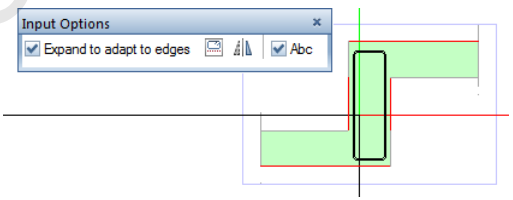


6 The **Expand to adapt to edges** and **Label** options are active in the input options. Move the crosshairs in section A-A to the component line on the left within the general arrangement.

The bending shape will expand and the hook will appear at top right when you click the left edge.

7 Click in the workspace.

The stirrup is created.



8 Click in the workspace with the right mouse button and select **Place Bar Shape** on the shortcut menu.

9 Define the total length of the beam as the placing region by clicking the points at the bottom of the beam in the view. Select **Align** in the input options. The **Label** option remains active.

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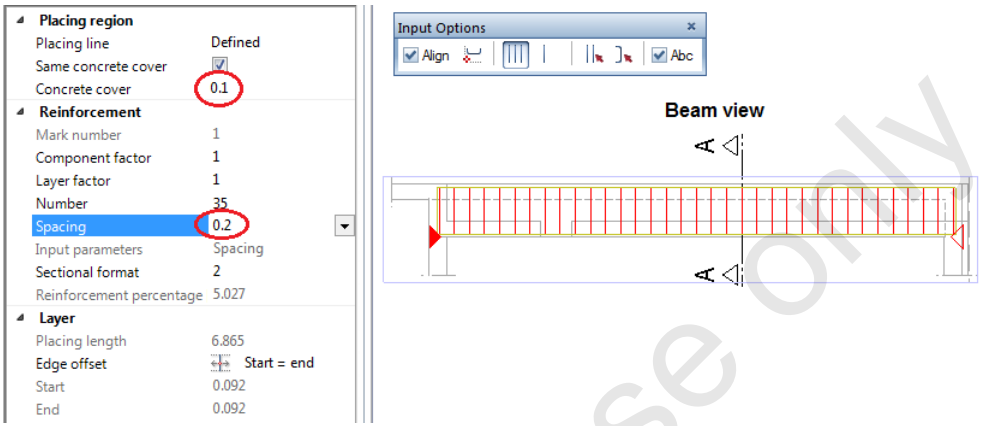
10 Open the **Place Bar Shape** palette, click in the title bar, change the **Concrete cover** to **0.10** and enter **0.20** for the offset.



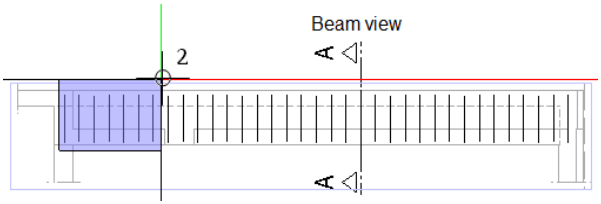
11 Press ESC to finish creating the stirrup reinforcement.

The support area of the beam requires stirrups of diameter 10, which are to be spaced at 15 cm. For this, you will now modify the stirrup placement.

To modify the stirrup placement

1 Click **New Mark Number** (**Engineering Modify** flyout).

2 *What is to become a new mark?* If necessary, click **Select Elements based on Direction** (**Filter Assistant** toolbar) and enclose the first seven stirrups at the left support in a selection rectangle, which you open from left to right.



3 Allplan will propose a new mark number (based on the last mark number assigned plus one). Accept.

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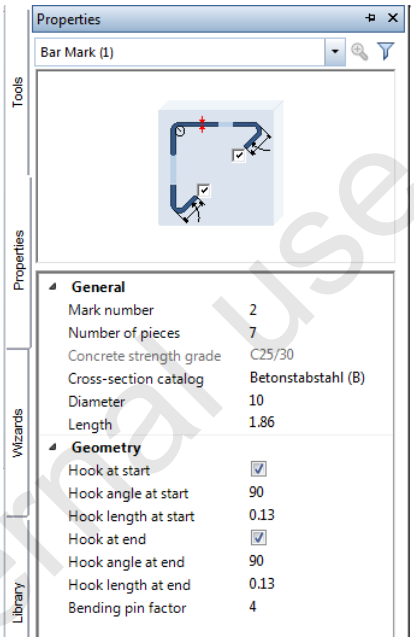
4 Using the same approach, assign a new mark number to the last seven stirrups at the right support and press ESC to quit the tool.

5 Click a stirrup at the left support, open the **Properties** palette and select **Bar Mark (1)** in the list box at the top.

6 In the parameter area of the palette, change the **Diameter** to **10** and click in the workspace to finish.



7 Then click a stirrup at the right support and change the **Diameter** to **10** as described above.

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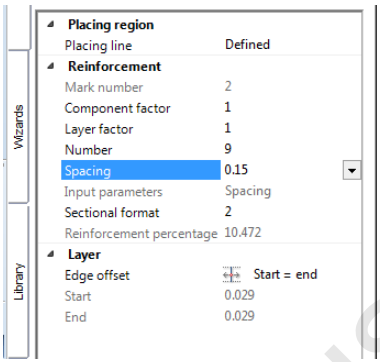
8 Click a stirrup at the left support again, open the **Properties** palette and select **Place Bar Shape (1)** in the list box at the top.

9 In the parameter area of the palette, change the **Spacing** to **0.15** and click in the workspace to finish.



10 Use the same approach to change the offset at the right support to **0.15**.

11 Click any stirrup with the right mouse button, select **Rearrange Marks** on the shortcut menu, select all the options, click **OK** to confirm the dialog box and press ESC to quit the tool.

12 Use the shortcut menu and the **Label** or **Dimension Line, Label** tool to label the stirrup placement in the section and in the view.

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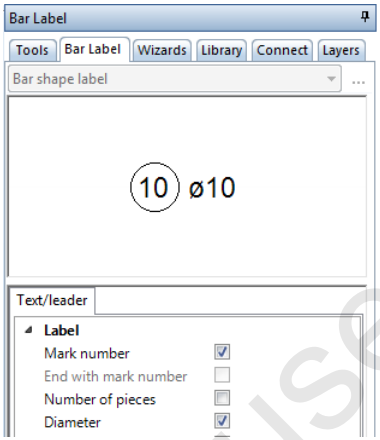
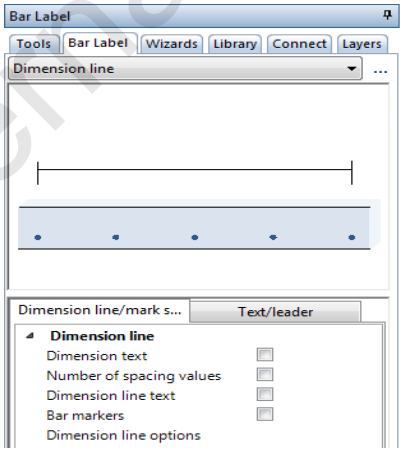
- Place the label with the mark number and diameter in the section. Open the **Options for text** and change the aspect to **1.00**.



- To label the three placements in the view, set the dimension line type to **Dimension line**.



- Place the dimension lines below the view and set the text parameters so that the number of pieces, diameter and spacing are displayed.

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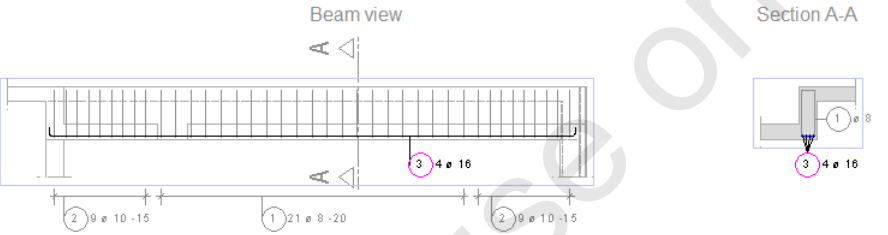
Task 4: bottom longitudinal reinforcement

Overview

For the bottom longitudinal reinforcement, you will place 4 bars of diameter 16 with end hooks.



Use the following tool(s) to do this:

Function	How to activate it
Bar Shape	**Repeat** menu
Label	Selected automatically
Place Bar Shape	Selected automatically
Dimension Line, Label	Selected automatically

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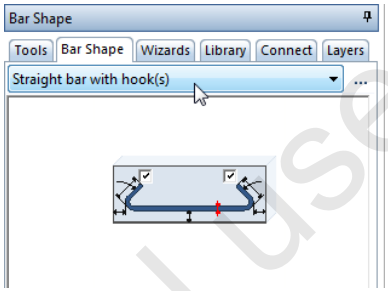
Solution

To create the bottom longitudinal reinforcement

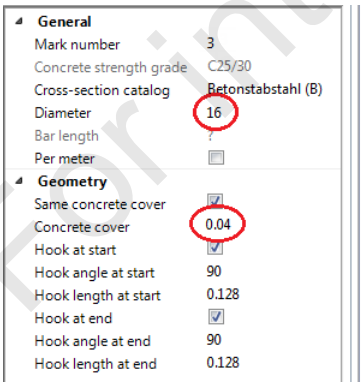
1 On the **Repeat** menu, click **Bar Shape**.
Check that the layer **BR_B** is current; if it isn't, select it on the **Format** menu or toolbar.

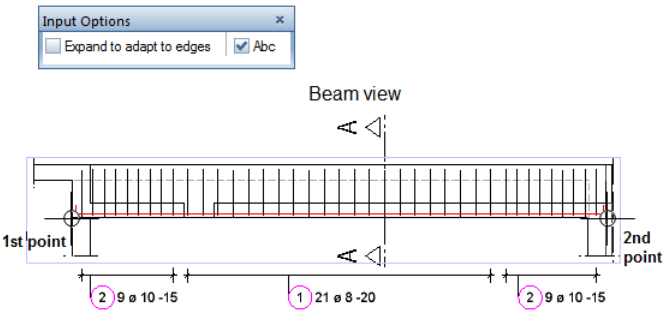
2 Select the **Straight bar with hook(s)** bending shape in the list box at the top of the **Bar Shape** palette.



3 In the parameter area of the palette, select diameter **16** and change the **Concrete cover** to **0.04**.

4 Clear the **Expand to adapt to edges** check box in the input options and click the two bottom corners of the beam in the view.





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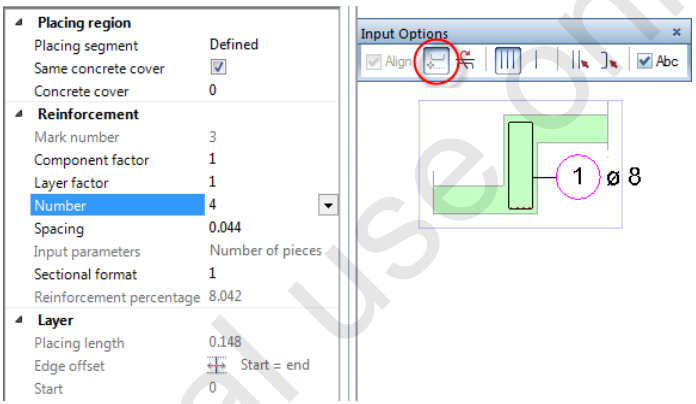
5 Press ESC to start the **Label** tool and place the bar label with the mark number, number of pieces and diameter below the bar.

The **Place Bar Shape** tool opens automatically.

6 Click **Segment** in the input options and click the bottom stirrup leg in section A-A.

7 Enter **4** for the number of pieces in the **Place Bar Shape** palette.



8 Press ESC twice to quit the tool and to start the **Dimension Line, Label** tool.

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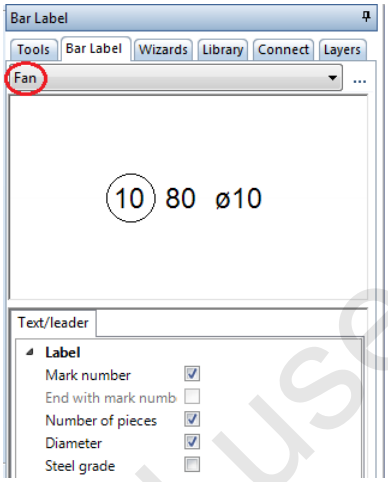
9 Select the **Fan** dimension line type in the palette and set the text parameters so that only the number of pieces and the diameter are included.



10 Open the **Options for text** and check that the aspect is set to **1.00**. Move the crosshairs to the right side of the section so that the mark number appears at the beginning and place the label below the placement.

The **Bar Shape** tool is still active.

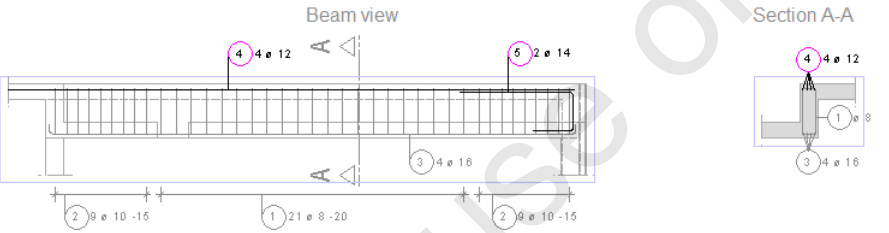
11 Press ESC to finish creating the bottom longitudinal reinforcement.

For internal use only

Task 5: top longitudinal reinforcement

Overview

You will place 4 bars of diameter 12 for the top longitudinal reinforcement. In addition, you will place 2 bars of diameter 14 for the restraints to the wall.



Use the following tool(s) to do this:

Function	How to activate it
Bar Shape	**Repeat** menu
Label	Selected automatically
Place Bar Shape	Selected automatically
Dimension Line, Label	Shortcut menu
Collision Check	**Modify** menu - **Bonus Tools** family - **3D Modeling** module

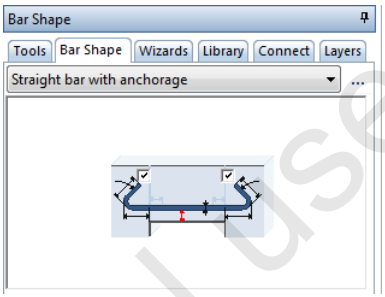
For internal use only

Solution

To create the top longitudinal reinforcement

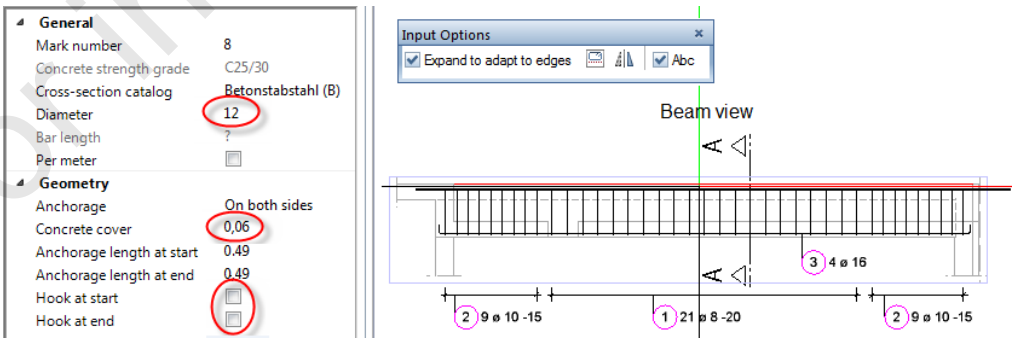
1 On the **Repeat** menu, click **Bar Shape**.
Check that the layer **BR_B** is current; if it isn't, select it on the **Format** menu or toolbar.

2 Select the **Straight bar with anchorage** bending shape in the **Bar Shape** palette.



3 In the parameter area of the palette, select diameter **12**, change the **Concrete cover** to **0.06** and clear the **Hook at start** and **Hook at end** check boxes.

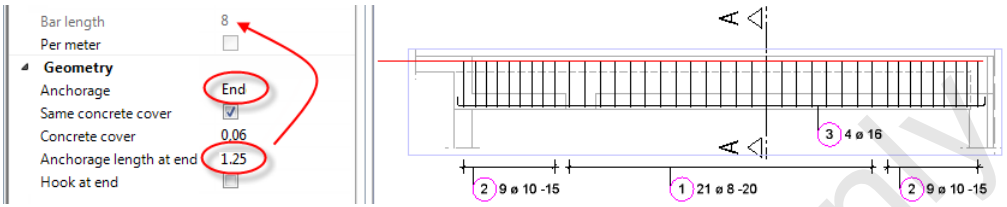
4 Select **Expand to adapt to edges** in the input options, move the crosshairs in the view to the component line at the top until the bending shape expands, then click in the workspace.



5 Select **End** for **Anchorage** and enter **1.25** for the **Anchorage length at end**.

For internal use only

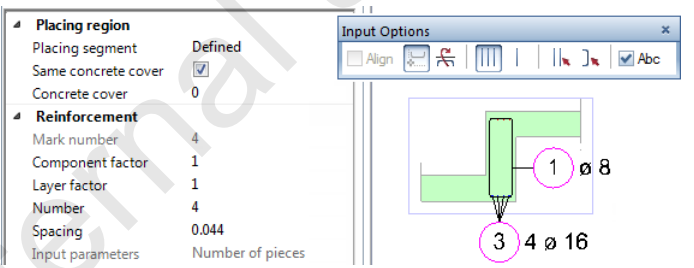
The resulting bars are 8.0 m long and extend into the slab in the area of the interior column.



6 Press ESC and place the label with the mark number, number of pieces and diameter in the view.

7 In the input options, click **Segment** again and then click the stirrup segment at the top in section A-A.

8 Check that the number of pieces is set to **4** in the **Place Bar Shape** palette.



9 Click in the workspace with the right mouse button and select **Dimension Line, Label** on the shortcut menu.

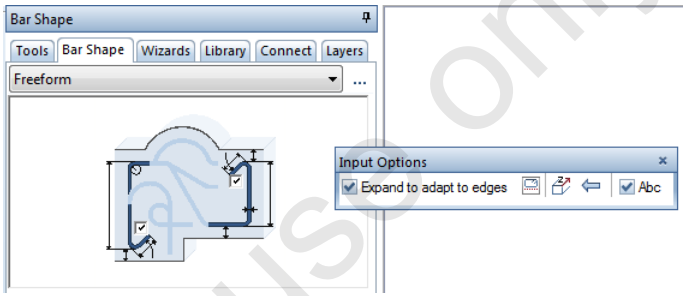
10 Move the crosshairs to the right side of the section so that the mark number appears at the beginning and place the label with mark number, number of pieces and diameter in section A-A.

For internal use only

To create restraints

1 The **Bar Shape** tool is still active. If it isn't, open the **Bar Shape** palette by double-clicking any bar with the right mouse button.
Select the **Freeform** bending shape.

Expand to adapt to edges is active in the input options.



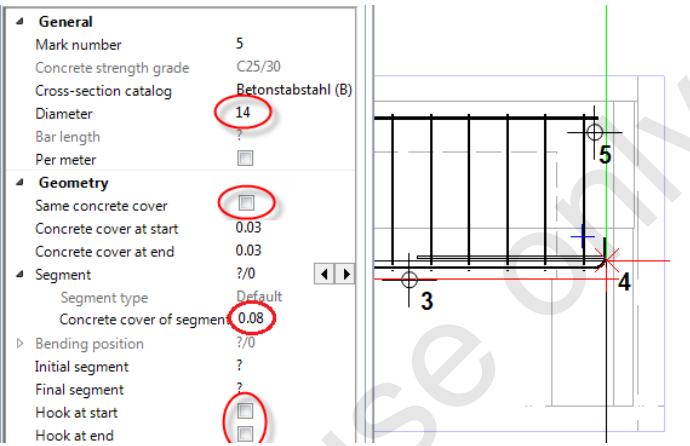
2 In the parameter area of the palette, select diameter **14**, clear the **Same concrete covers** check box, expand the **Segment** settings, enter **0.08** for the concrete cover of the segment and clear the **Hook at start** and **Hook at end** check boxes.

3 Move the crosshairs in the view to any point on the bottom edge in the area with the exterior wall on the right until it appears in the selection color, then click in the workspace.

4 Move the crosshairs to the front outer edge of the beam (represented by a continuous line) so that the selection ends at this edge and the bar segment is within the beam, then click in the workspace.

For internal use only

Note: Make sure that Allplan does not mark a point of the outline with a cross.



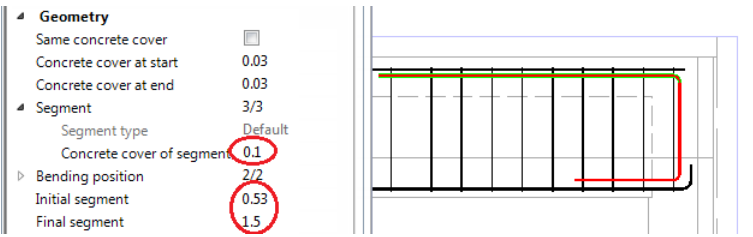
Tip: You can use ⇦ to undo every entry made in reverse order.
Pressing F11 switches track tracing off.

5 Move the crosshairs upward within the beam so that the vertical beam edge at the front appears in the selection color, then click in the workspace.

6 Change the concrete cover of the segment to **0.10**, move the crosshairs to any point on the top edge until it appears in the selection color and click in the workspace.

7 Press ESC to finish entering the bending shape.

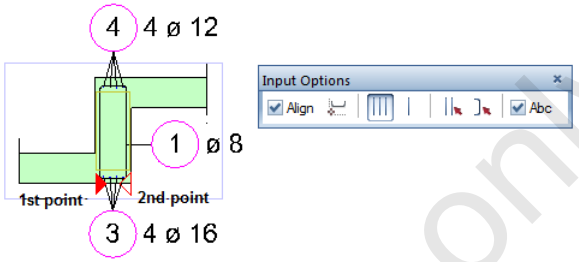
8 In the parameter area of the palette, enter **0.53** for the length of the **Initial segment** and **1.50** for the length of the **Final segment**.



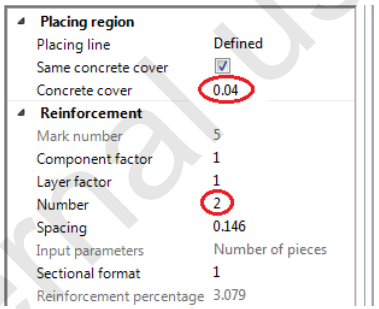
9 Press ESC and place the label with the mark number, number of pieces and diameter in the view.

For internal use only

10 In section A-A, click the bottom left corner and the bottom right corner of the beam to define the placing line.
Align is active in the input options.



11 In the **Place Bar Shape** palette, change the **Concrete cover** to **0.04** and enter **2** for the number.



12 Press ESC to finish.

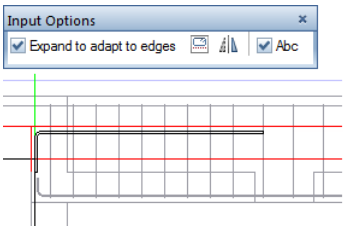
13 Finally, you can use the **Collision Check** tool (**Modify** menu - **Bonus Tools** family - **3D Modeling** module) to check whether the individual reinforcement elements collide.

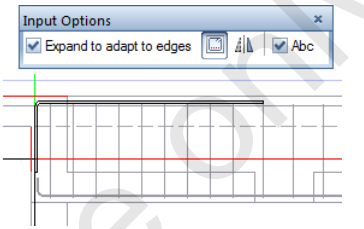
Allplan will highlight the area with the modified stirrups as the longitudinal bars and the stirrups overlap. If necessary, move the longitudinal reinforcement.

For internal use only

A note on edges for expansion

When you select **Expand to adapt to edges**, Allplan automatically finds the shell edges. If the **Connect to continuous lines only** setting is active in the input options, only lines of line type 1 are taken into account.

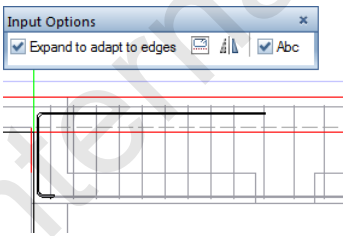




You also have the option to expand the bar beyond the edge of the existing shell.

To do this, wait until the bar expands, then move the crosshairs towards the edge of the shell which is to be ignored.

Example of an L-shaped bar with a hook on one side:



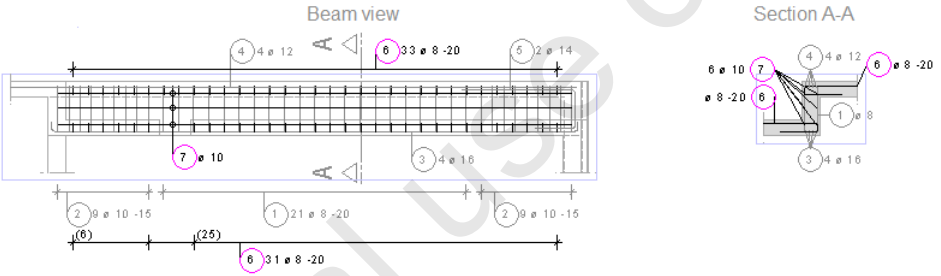
For internal use only

Task 6: starter bars for slab

Overview

First you will create starter bars for the upper slab section. Then you will copy and mirror them for the lower slab connection.

You will use straight bars for the web reinforcement and place them in the section where required.



Use the following tool(s) to do this:

Function	How to activate it
Bar Shape	**Repeat** menu
Place Bar Shape	Shortcut menu
Copy and Mirror	**Edit** toolbar
Move	**Edit** toolbar
Delete	**Edit** toolbar
Dimension Line, Label	Shortcut menu
Label	Shortcut menu or **Display** flyout
Place Bar Shape	Shortcut menu

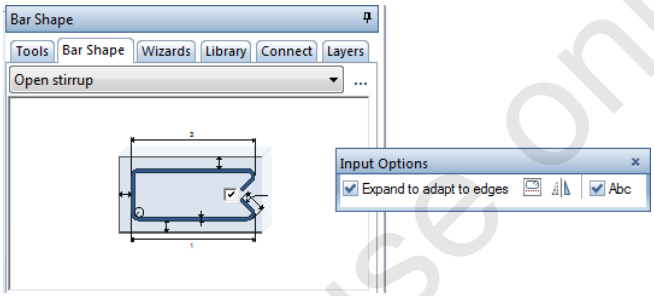
For internal use only

Solution

To create starter bars at the top

1 Select **Bar Shape** again and check the layer setting.

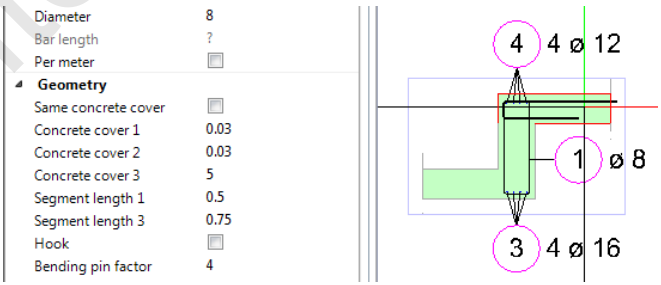
2 Select the **Open stirrup** bending shape in the **Bar Shape** palette.



3 In the parameter area of the palette, select diameter **8**, clear the **Same concrete covers** check box as the upper segment has a greater depth and change the value for **Concrete cover 3** to **0.05**.

4 Enter **0.50** and **0.75** for **Segment length 1** and **3** respectively and clear the **Hook** check box.

5 Move the crosshairs in section A-A to the top right edge of the slab.



The bending shape expands and the long segment of the open stirrup points upward. If it doesn't, change the segment lengths.

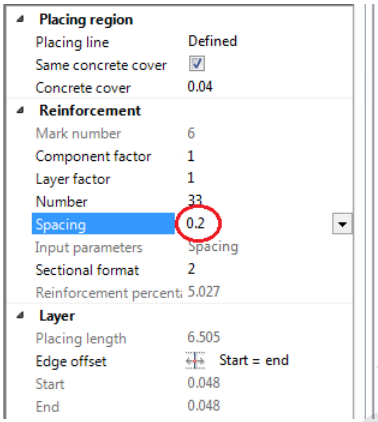
6 Click in the workspace to create the open stirrup.

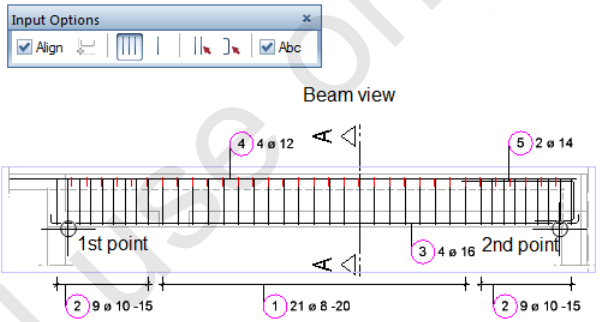
For internal use only

7 Click in the workspace with the right mouse button and select  **Place Bar Shape** on the shortcut menu.

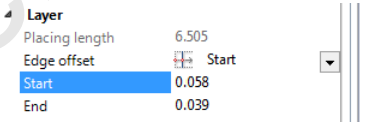
8 Define the clear opening of the beam as the placing region by clicking the points on the lower side in the view.

9 Enter **0.20** for the spacing in the **Place Bar Shape** palette.





Note: If the open stirrups and the beam stirrups are congruent, select  **Start** for the **Edge offset** and increase the value for **Start**.



10 Press ESC to finish. You will dimension the stirrups later.

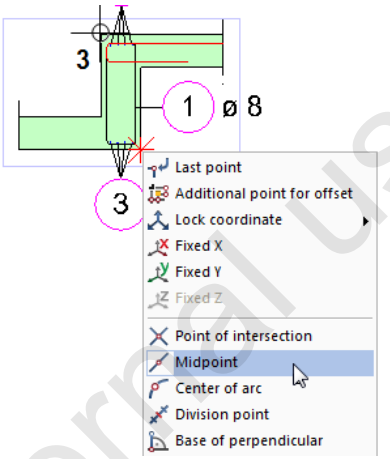
For internal use only

To create the starter bars for the lower slab, you will mirror the open stirrups you just created and move them downward.

To create starter bars at the bottom

1 Click **Copy and Mirror** (**Edit** toolbar) and select the open stirrup you just created in the section.

2 Using the right mouse button, click the bottom right corner of the beam in the section and choose **Midpoint** on the shortcut menu.



3 Click the top left corner of the beam to define the end point.

4 *2nd point of mirror axis:* create a vertical track line of any length and click in the workspace.

5 Click **Move** (**Edit** toolbar) and select the mirrored placement by double-clicking in the workspace with the right mouse button.

6 Click the top left corner of the beam and then the point where the top of the slab on the left and the beam intersect in order to move the mirrored placement into the lower slab.

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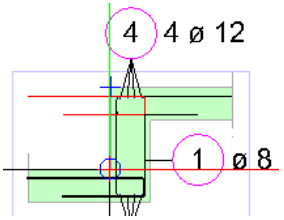


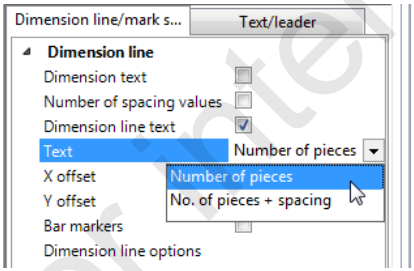
7 **Delete** (**Edit** toolbar) the two open stirrups in the area around the lower slab recess in the view and press ESC to quit the tool.

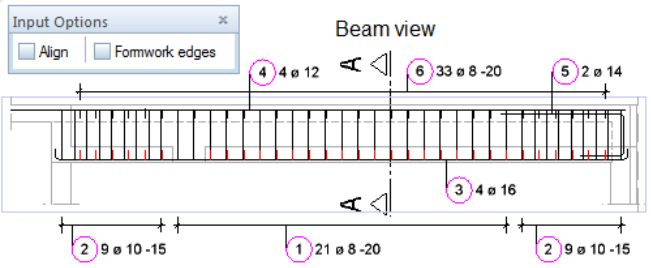
8 In the view, click a bar of the open stirrups you placed at the top with the right mouse button and select **Dimension Line, Label** on the shortcut menu.

9 Set the dimension line type to **Dimension line**, place the dimension line above the placement and set the text parameters so that the number of pieces, diameter and spacing are displayed.

10 Use the **Brackets** to select the two open stirrups placed beside the lower slab recess in the view. Alternatively, you can also enclose them in a selection rectangle.

11 Select the **Dimension line text** option, choose **Number of pieces** for the text and place the label.





12 Finally, click **Label** and create labels for the starter bars at the top and bottom in the section. Set the text parameters so that the diameter and spacing are displayed.

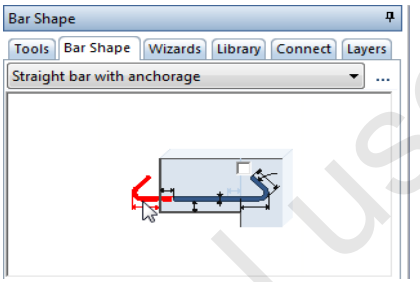
For internal use only

To create web reinforcement

1 Select **Bar Shape** and check the layer setting.

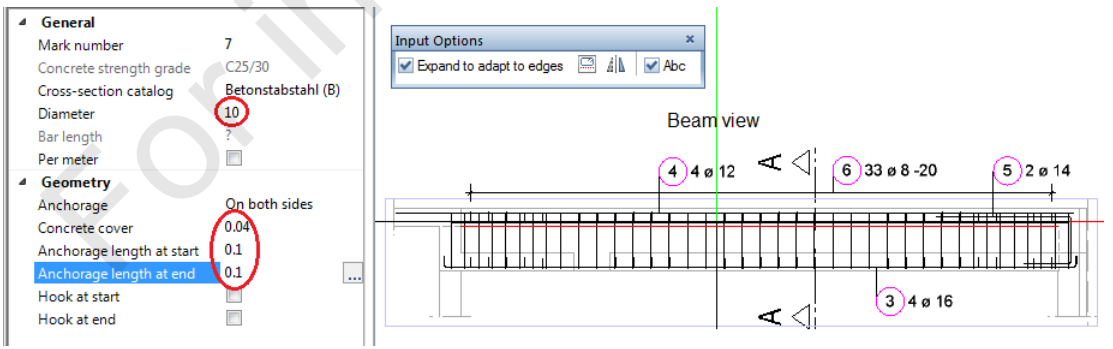
2 Select the **Straight bar with anchorage** bending shape in the **Bar Shape** palette.

3 When you created the top longitudinal reinforcement, you set the anchorage to **End**. This setting is still selected. In the graphics, click the continuation of the bar indicated on the left to define an anchorage **on both sides**.



4 In the parameter area of the palette, select diameter **10**, change the value for **Concrete cover** to **0.04** and enter **0.10** for the anchorage length at the start and end.

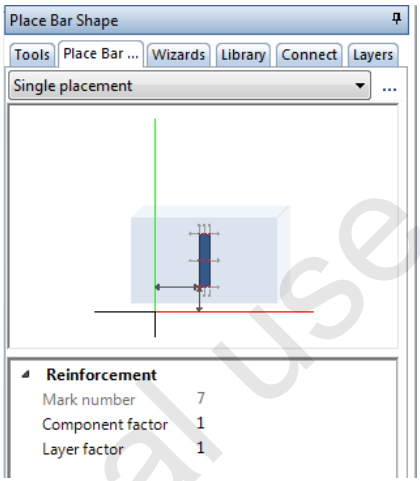
5 Move the crosshairs in the view across the bottom level of the upper slab until the bending shape expands; then click in the workspace.



For internal use only

6 As the bar needs to be placed in various places in the area of the beam, click in the workspace with the right mouse button and select **Place Bar Shape** on the shortcut menu.

7 Select **Single placement** in the list box at the top in the **Place Bar Shape** palette.



8 *Select view:* click within the section.

9 Place the bars as follows:

- In the input options, select the **Anchor point** as you need and set the **Offset in X direction** to **0.04** and the **Offset in Y direction** to **0.04** or **0.06**.
- To place the bars at the points where the stirrups meet, click the points where the slabs and the beam intersect.
- To place the bars in the middle, use the **Midpoint** option on the shortcut menu.
- Press ESC to finish placing the bars.

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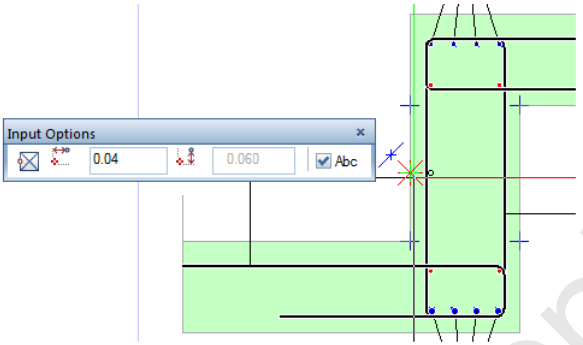
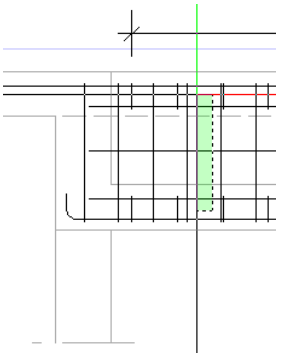
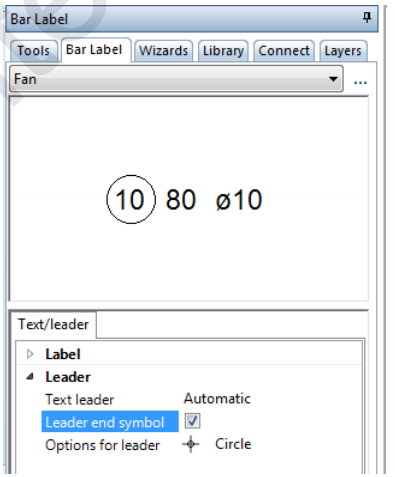


The **Fan** dimension line type is set automatically.

10 Place the label with the mark number, number of pieces and diameter in the section.



11 Finally, select **Dimension Line, Label** and create a label with the mark number and diameter for the web reinforcement in the view.
Select the bars using the **Brackets**. Alternatively, enclose them in a selection rectangle (from right to left: this selects all elements that are fully bounded and intersected; the selection rectangle is dashed, and the area it covers is displayed in green).
Here, too, use the **Fan** dimension line type and apply a leader end symbol to the bars.

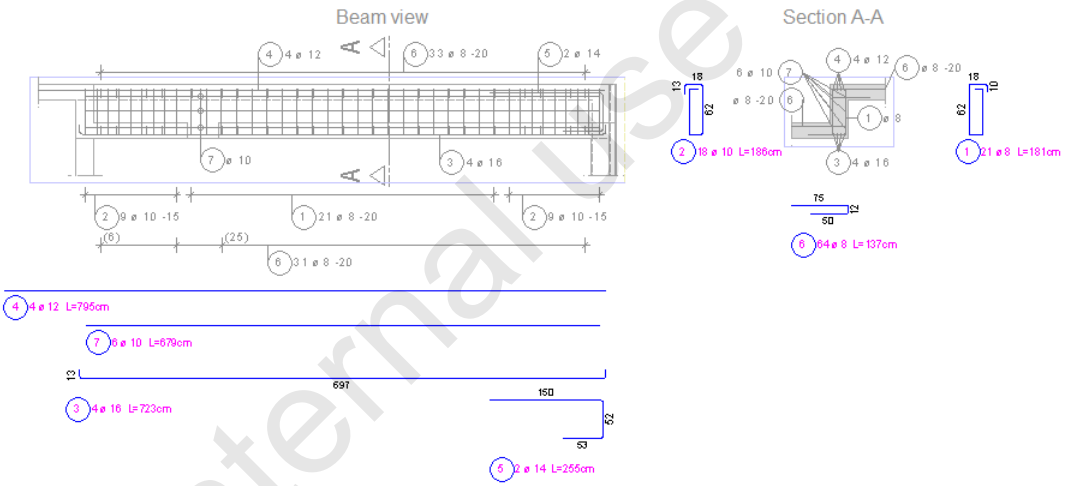


For internal use only

Task 7: reinforcement schema

Overview

You can use the **Full Schema** tool, which was covered in the chapter 'Number-off management', to display all the bars in the beam in your drawing. To better illustrate how each of the bars is to be fixed, you can position the schema bar horizontally and vertically.



Use the following tool to do this:

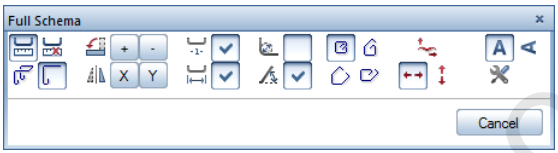
Tool	How to activate it
Full Schema	Shortcut menu

For internal use only

Solution

To create schemas

1 Click the stirrup in section A-A with the right mouse button and select **Full Schema** on the shortcut menu.



2 Enter the settings as shown above and confirm.

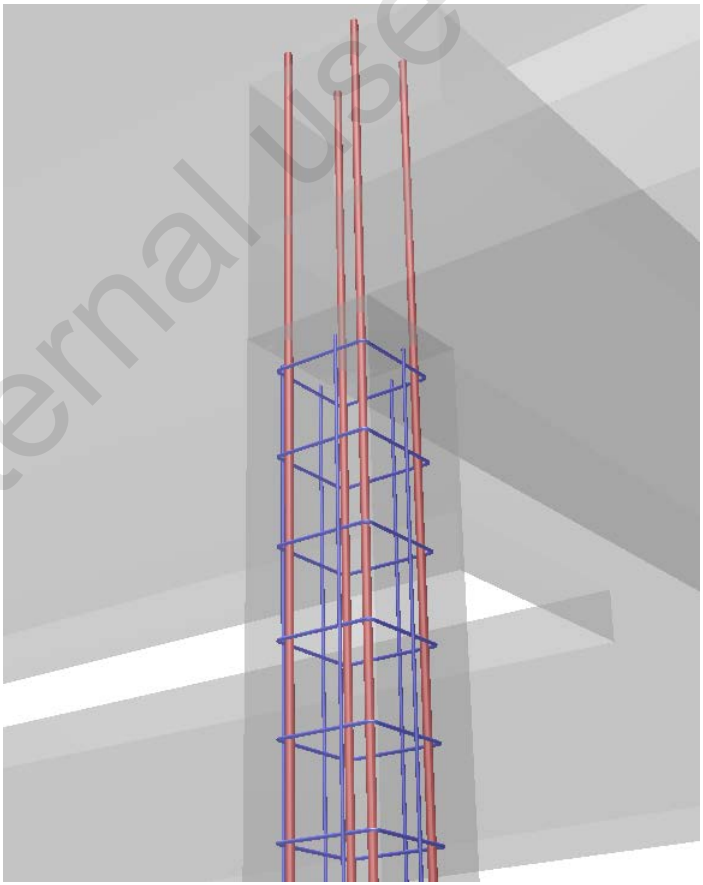
3 The schema and its label are attached to the crosshairs. Place the schema in the drawing file.

4 You should be able to create the other bar schemas yourself. For straight bars, you can switch off **Segment dimensioning**.

For internal use only

Exercise 2: column reinforcement

In this exercise you will create the reinforcement for the column. For the column shell, copy the beam's shell to a new drawing file, delete the cross-section, modify the view and then create a new section. This shell will serve as the basis for the column reinforcement.

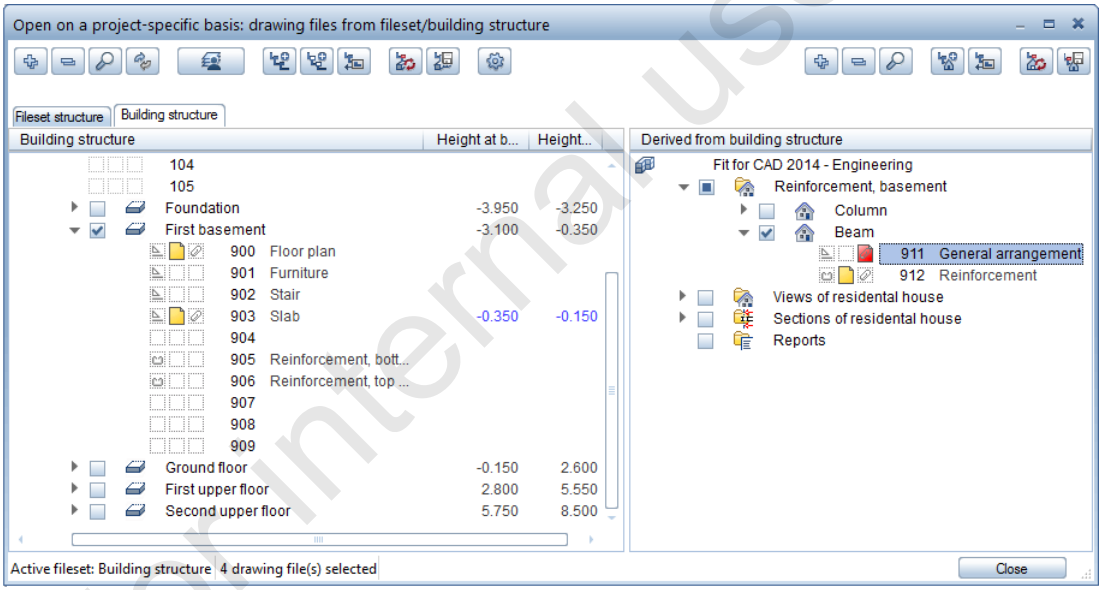


For internal use only

Task 1: creating a new structural level in the right-hand part of the building structure

Overview

As described in the last exercise, you will create an additional subfolder for the **Column** component in the **Reinforcement, basement** folder in the right-hand part of the building structure, assign the required drawing files and label them.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar

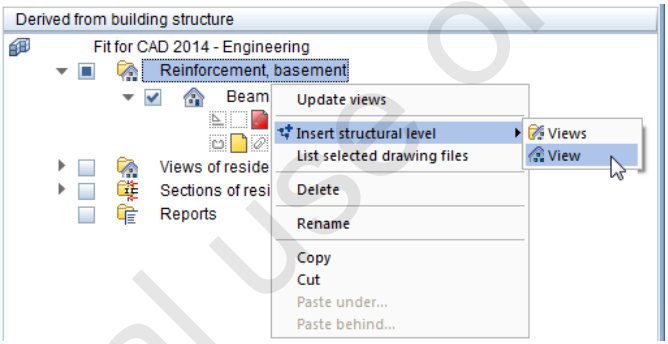
For internal use only

Solution

To add new objects derived from the building structure

1 Click **Open on a Project-Specific Basis**.

2 In the **Derived from building structure** area on the right, open the **Reinforcement, basement** structural level, point to **Insert structural level** and click **View**.



3 Rename the new structural level **Column**.

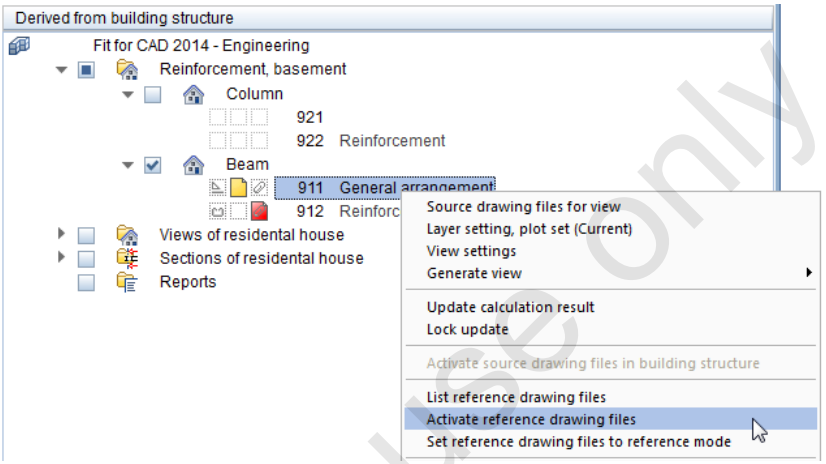
4 Open the shortcut menu of the **Column** structural level, select **Assign drawing files...** and choose drawing files 921 and 922. Name drawing file 922 **Reinforcement**.

Note: When you copy the general arrangement to drawing file 921, it is automatically named **General arrangement**.

Tip: To change the order of the structural levels, press ALT and the left mouse button and drag the structural level (column, for example) to the structural level after which you want to insert it (beam, for example). Then release the mouse button.

For internal use only

5 Open the shortcut menu of drawing file **911 General arrangement** and click **Set reference drawing files to edit mode.**



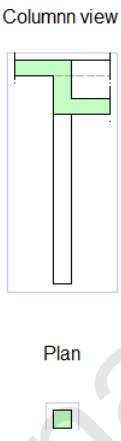
6 **Close** the dialog box.

For internal use only

Task 2: shell for the column

Overview

The general arrangement used in exercise 1 will be modified for use with the column.



Use the following tool(s) to do this:

Function	How to activate it
Copy, Move Elements between Documents...	**File** menu
Open on a Project-Specific Basis	**Default** toolbar
Manage Reference Drawing Files	Shortcut menu
Delete	Shortcut menu
Select, Set Layers	Shortcut menu
Convert Section to View	Shortcut menu
Create Section	Shortcut menu
Convert View to Section	Shortcut menu

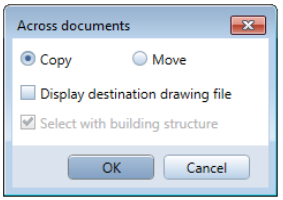
For internal use only

Solution

As the column only requires the beam's general arrangement without reinforcement, you will remove the reference to the reinforcement drawing file after you have copied the data.

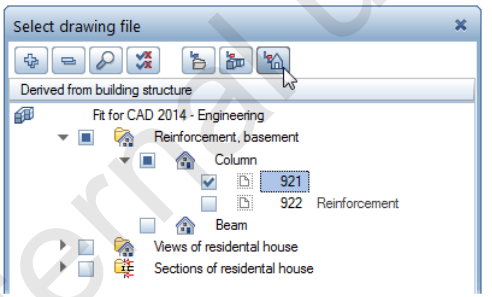
To copy the beam's general arrangement drawing

1 Click **Copy, Move Elements between Documents...** (**File** menu).

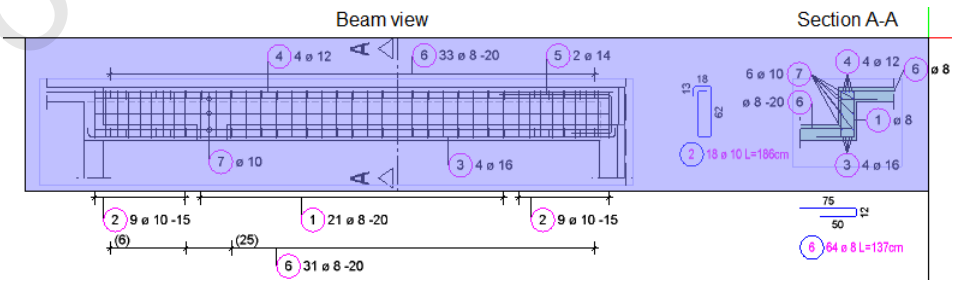


2 The **Across documents** dialog box opens. Make sure that the **Copy** setting is selected and click **OK** to confirm.
The **Select with building structure** option is selected by default.

3 In the **Select drawing file** dialog box, click **Derived from building structure**, select drawing file **921** and click **OK** to confirm the dialog box.



4 Use the **Brackets** or a selection rectangle to select the entire general arrangement drawing of the beam (view and section) including the reinforcement.
It is important that you select the two view borders!



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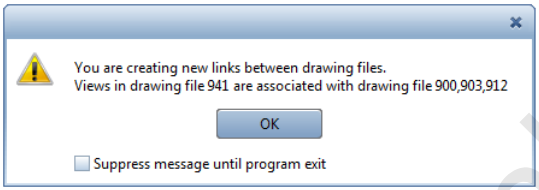
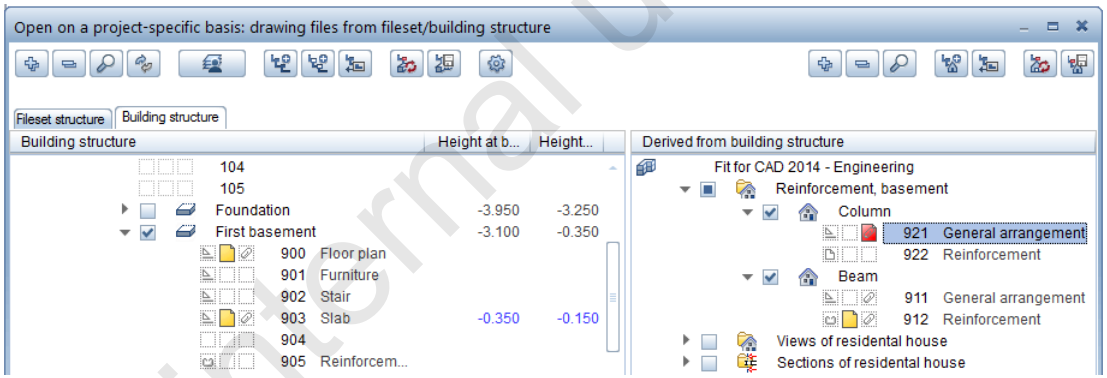
5 A note appears announcing that you are creating new references to drawing files. Click **OK** to confirm this note.



6 Click **Open on a Project-Specific Basis**, open the **Column** structural level and the shortcut menu of drawing file **921 General arrangement** and click **Set reference drawing files to edit mode.**
This closes drawing file 911 as it is not associated with drawing file 921.



7 Close the dialog box, click one of the two view borders with the right mouse button and select **Manage Reference Drawing Files** on the shortcut menu.

Tip: Click **Edit** unless all reference drawing files are open in edit mode.

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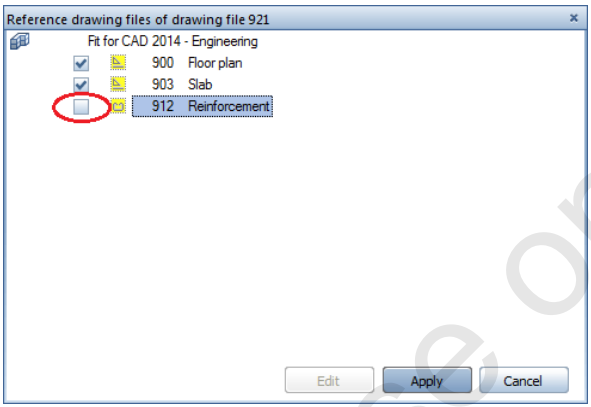
8 Clear the check box of drawing file **912** and click **Apply** to remove the reference to this drawing file.



9 Click **Open on a Project-Specific Basis** and deactivate the **Beam** structural level.
This closes drawing file 912.

To create the general arrangement drawing for the column, you will delete the cross-section of the beam, convert the section of the beam view back to a view and create a new section for the plan view.

To modify the general arrangement drawing

1 Click the view border of section A-A with the right mouse button and select **Delete** on the shortcut menu.

2 Press ESC to finish and select **SH_GEN** as the current layer so that it is used for the label.

3 Click the view border of the beam view's section with the right mouse button and select **Convert Section to View** on the shortcut menu.

4 Enter **View, column** for the label of the view, press ENTER to confirm and place the label above the view in the area with the column.

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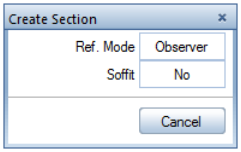
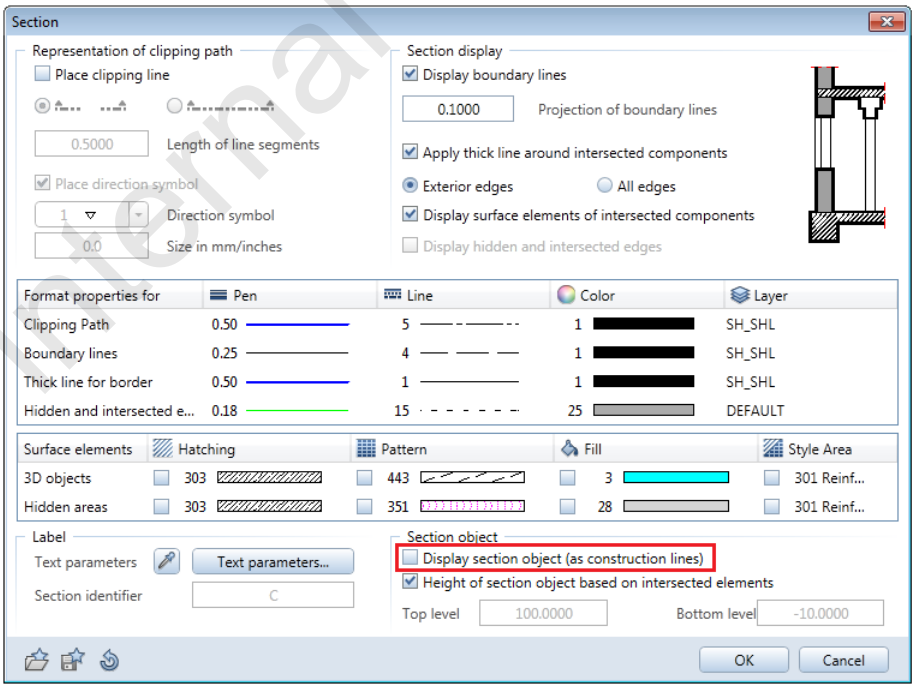
5 Press ESC to quit the tool, click the view border of the beam view with the right mouse button again and select **Create Section** on the shortcut menu.



6 Create a new section in the area with the column through the view you just converted back.
Leave the reference mode set to **Observer**, set the viewing direction from the top, click **Section settings for associative view** and make the following settings:

- Check the **Display of clipping path** area to see whether the **Place clipping line** option is not active.
- Check the **Section display** area to see whether the first three options are active.
- In the **Section object** area, clear the **Display section object (as construction lines)** check box and click **OK** to confirm the dialog box.



For internal use only

7 Place the section below the view and delimit the depth of the section.

8 Enter **Plan** for the label in the dialog line, press ENTER to confirm and place the label above the section.

9 Convert the beam view to a section using  **Convert View to Section**.

- Click the view border of the view with the right mouse button and select this tool on the shortcut menu.
- Click  **Show Clipping Path** and select the **Apply thick line around intersected elements** and **Display surface elements of intersected components** check boxes in the **Section display** area. Clear the **Display section object (as construction lines)** check box.
- Define the first clipping area in the view so that only the beam and slab connections beside the column are displayed.
- Define the second clipping area in the section of the plan view so that the section ends at the bottom in front of the column.
- Skip the prompt for the label by pressing ESC.
  Allplan retains the original label.

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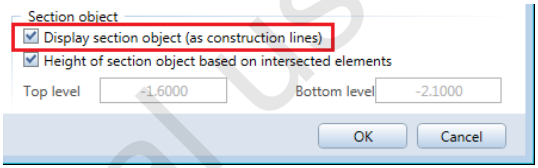
A note on modifying the clipping area later

If a section does not display the desired elements, you can modify the clipping area without having to place the section again.

Modifying the clipping area

1 Click **Modify View and Section Properties** (shortcut menu or **Tools** palette, **Change** area) and select the section whose section object you want to display.

2 On the **View and Section Properties** Context toolbar, click **Section settings for associative view** and select the **Display section object (as construction lines)** check box. Then click **OK** to confirm the dialog box.



3 Click **Apply** to confirm the **View and Section Properties** Context toolbar.

4 Use **Modify Offset** (**Edit** toolbar) to modify the section object.

Note: When you modify the model of the section object, you first need to click a line that is parallel to the reference line. You can then use the input options to specify whether all edges are moved or the selected edge only. This way, you can also tilt areas.

Tip: You can use **Show Clipping Path** to show the section object with or without the clipping path in any view/section.

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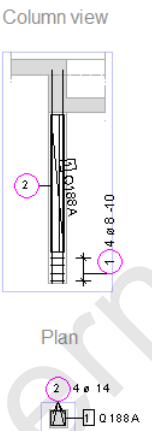
Task 3: column reinforcement with FF component

Overview

In this exercise you will create the reinforcement for the column using a predefined component. You will define reinforcement parameters in a dialog box and then place the bending shapes created by Allplan.



Use the following tool(s) to do this:

Function	How to activate it
FF Components	**Enter Bending Shape and Placement** flyout
Select, Set Layers	**Format** toolbar
Dimension Line, Label	**Display** flyout

For internal use only

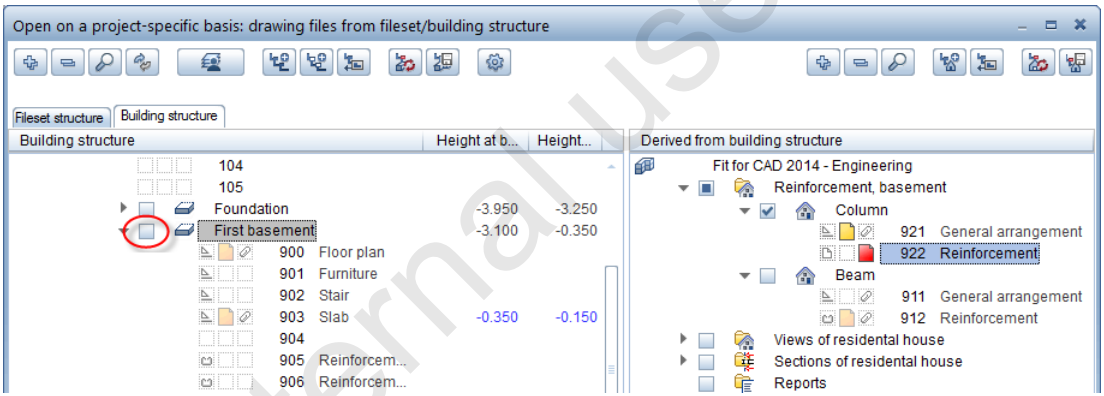
Solution

To create column reinforcement using FF components

➲ Open the **Options, Reinforcement** page, and check that the **Reinforce with 3D model** option is selected.

1 Double-click in the workspace with the left mouse button. The dialog box for selecting drawing files and filesets opens.

2 Deactivate the **First basement** structural level in the building structure on the left-hand side of the dialog box, move to the right-hand side of the dialog box, make drawing file **922 Reinforcement** current and **Close** the dialog box.



3 Check that the reference scale in the status bar is set to **1:50**.

4 Click **FF Components** (**Bar Entry and Placement** flyout). Check that the layer **BR_B** is current; if it isn't, select it on the **Format** menu or toolbar.

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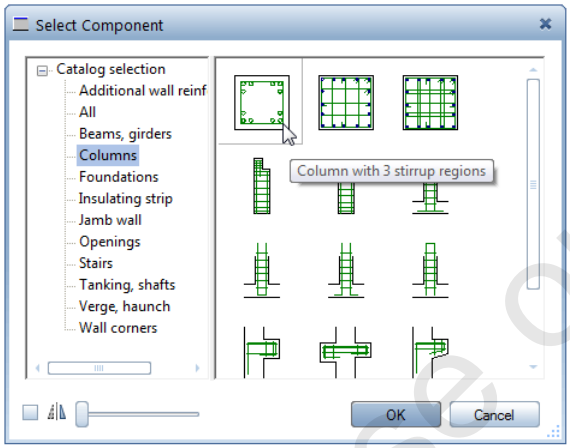
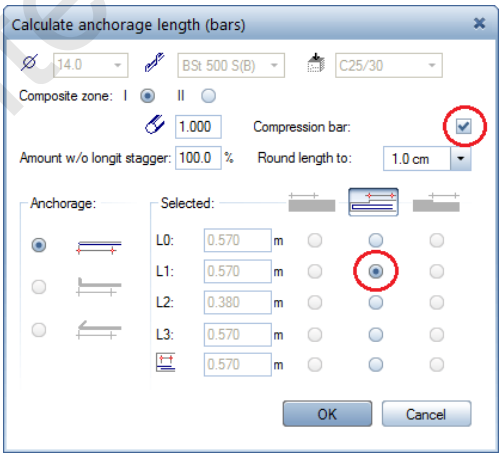
5 Select the **Column with 3 stirrup regions** component.



6 Set the global diameter to **8**, enter **0.10** for the global bar spacing and **0.03** for the global concrete cover.

7 Change the diameter of the longitudinal column reinforcement to **14.0** and click **Calculate anchorage length.**

8 Select the **Compression bar** setting and the **L1** anchorage length. Then click **OK** to confirm the dialog box.



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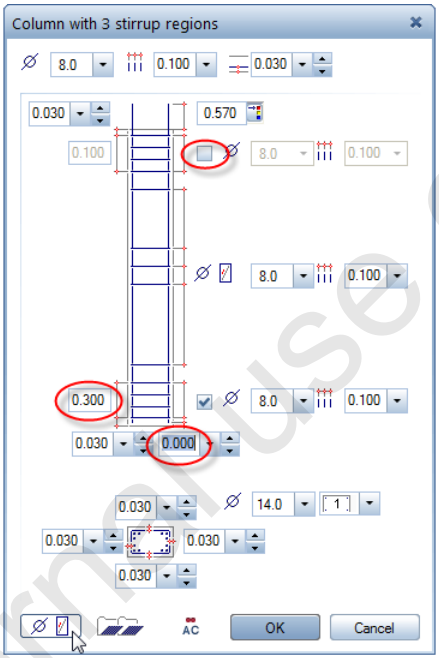
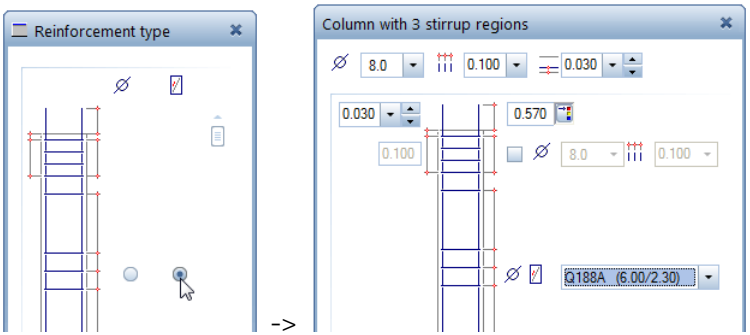
9 Deactivate the upper area of the column as the longitudinal reinforcement can be anchored within the beam. Change the area at the bottom to **0.300** and set the concrete cover of the longitudinal bars at the start of the column to **0.000**.



10 Click  at bottom left in the dialog box to place bent-up mesh in the area in the middle.

11 Select the  **Meshes** option, click **OK** to confirm the dialog box and set the mesh type to **Q188A**.



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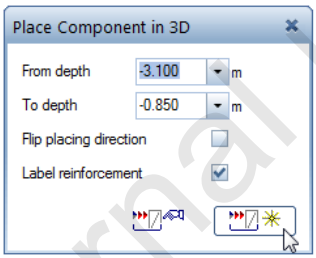
12 Click **OK** to confirm the settings. In the view where the column is displayed in plan, move the crosshairs to the component line on the left.

The component expands and a preview of it is displayed in plan.
Note: If you wish to alter the settings again, click the right mouse button and select on the shortcut menu. The preview will automatically update to reflect any changes you make in the dialog box.

13 Click in the workspace. The entire placement is displayed in plan and in the view.

14 The **Place Component in 3D** dialog box opens. Select the **Label reinforcement** option, click **Place automatically** and place the label of the bent-up mesh in plan.



15 Set the dimension line type to **Dimension line**, clear the **Dimension line text** check box and place the dimension line to the right of the column in the view.

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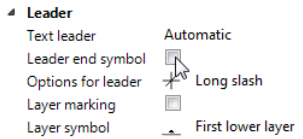
16 Place the label with the number of pieces, diameter and spacing to the right of the dimension line. Then press ESC as you do not want to dimension the reinforcement model.

17 For the first longitudinal reinforcement on the left, place the label with the mark number to the left of the column in the view.

18 Skip the prompts for the labels in plan and in the reinforcement model and cancel the process of creating more longitudinal reinforcement in plan, in the view and in the reinforcement model by pressing ESC each time.

19 Use **Dimension Line, Label** (**Display** flyout) to create a common label for all four bars in the column in plan. Select **Fan** for the dimension line type and set the label's parameters so that only the number of pieces and the diameter are included. Switch off the leader end symbol.

Tip: To clearly show that the bar and the label belong together, you can select a symbol that is placed at the end of the leader.



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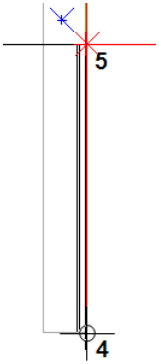
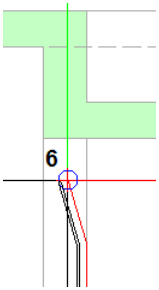
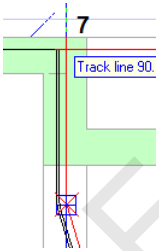
A note on creating cranked bars







Tip: You can also define the segment type in the graphics area.

You have already encountered the freeform bending shape provided by the **Bar Shape** tool when you created the restraints. You can also use this shape to create specific bending shapes such as cranked bars. You select the segment type when you enter the bar.

To create a cranked bar in the column

1 Select the **Freeform** bending shape in the **Bar Shape** palette.

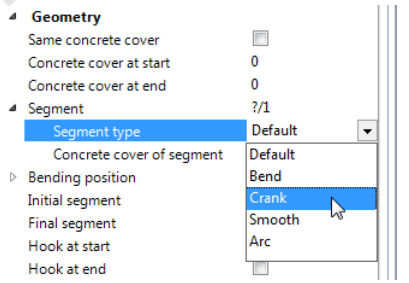
2 Clear the **Same concrete covers** check box and enter **0.00** for the **Concrete cover at start** and **Concrete cover at end**.

3 Click the arrow to the left of the **Segment** parameter and enter **0.04** for the **Concrete cover of segment**.

4 Click the bottom right corner of the column.

5 Move the crosshairs to any point in the upper third of the right-hand edge of the column until it appears in the selection color, then click in the workspace.
Make sure that the preview of the segment is within the column. If the **Expand to adapt to edges** option is not selected, you can use **Switch concrete cover** to change the position of the segment.

6 In the parameter area of the palette, select **Crank** for the **Segment type**, move the crosshairs upward to the left without selecting an edge and click in the workspace.



7 The segment type automatically switches back to **Default**. Move the crosshairs vertically upward to a point below the top edge of the slab and click in the workspace. Use track tracing.

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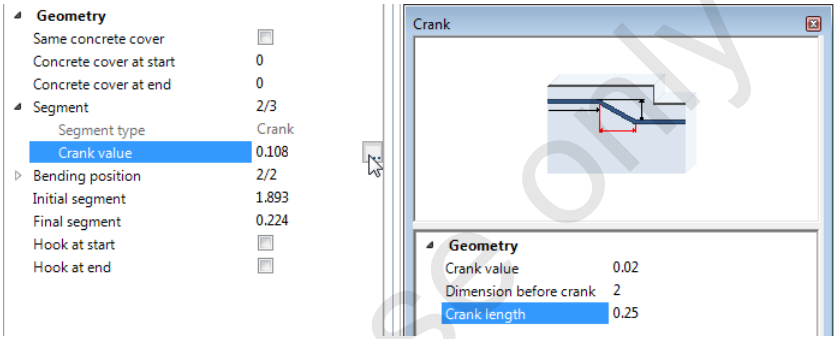
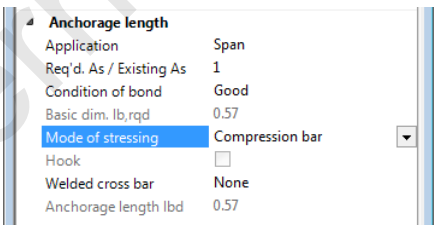
8 Press ESC to finish entering the bending shape, click the **Segment** parameter, click to select the segment 2/3 and then click beside **Crank value**.

9 Enter values in the **Crank** dialog box and click **OK** to confirm.



10 Click the **Final segment** parameter and then to define the anchorage length.

11 Select the **Compression bar** stress type, leave the other settings as they are and click **OK** to confirm the dialog box.



12 To create the bar, press ESC or select another tool on the shortcut menu.

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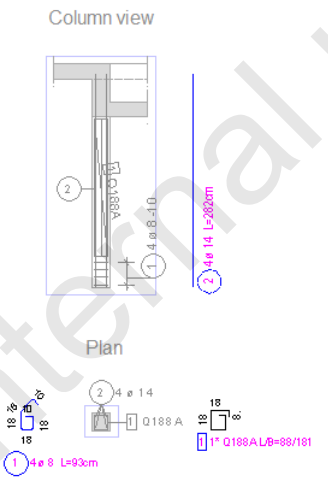
Task 4: reinforcement schema

Overview

As with the beam reinforcement, you can use the **Full Schema** tool to display all the bars for the column in your drawing. Here, too, you can position the schema bar horizontally and vertically.

If several components have identical mark numbers and you want to display the bars of the individual components, you can use **Partial Schema** to create partial schemas instead of a full schema. You will use this tool to create schemas for the longitudinal bars.



Use the following tools to do this:

Tool	How to activate it
Partial Schema	**Display** flyout
Full Schema	Shortcut menu

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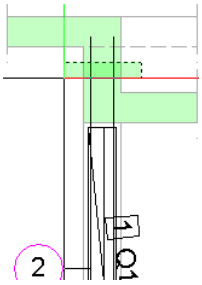
Solution



To create partial schemas

1 Click **Partial Schema** (**Display** flyout).

2 Select the longitudinal bars of the column in the view by enclosing them in a selection rectangle (from right to left: this selects all elements that are fully bounded and intersected; the selection rectangle is dashed, and the area it covers is displayed in green).

3 Enter the settings as shown above and confirm.

4 The schema and its label are attached to the crosshairs. Place the schema in the drawing file.

Note: When you use a selection rectangle to select the four bars in plan, you need to activate the **Position Freely** option in order to place the partial schema so that is to the right of and aligned with the column.

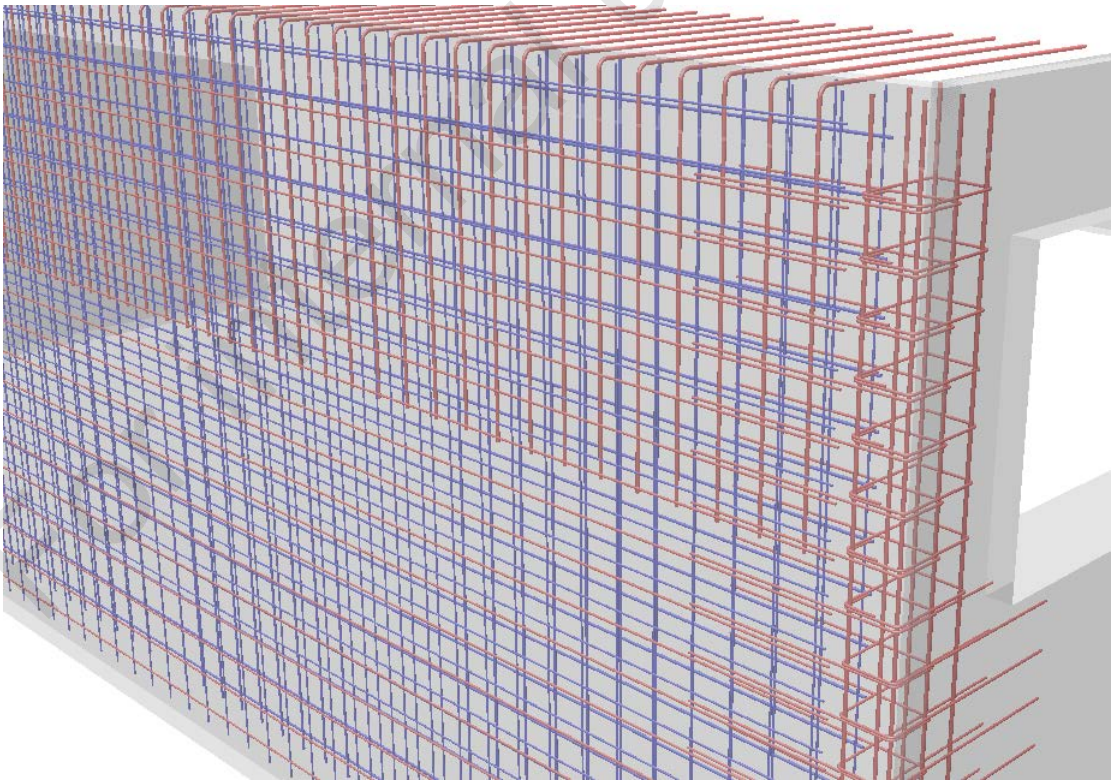
5 You should be able to create the full schemas yourself.
For the stirrups, switch on leg dimensioning. You can also display unfolded schemas.

For internal use only

For internal use only

Exercise 3: wall reinforcement

In the following exercise, you will reinforce the exterior wall on the left in the basement. As with the beam and column reinforcement, you will create a new structural level for the wall view and the required sections in the right-hand part of the building structure.
To create the wall reinforcement as rationally as possible, you will use the familiar area reinforcement, FF components and bar shape tools.
Finally, you will display the interior and exterior reinforcement layers separately.

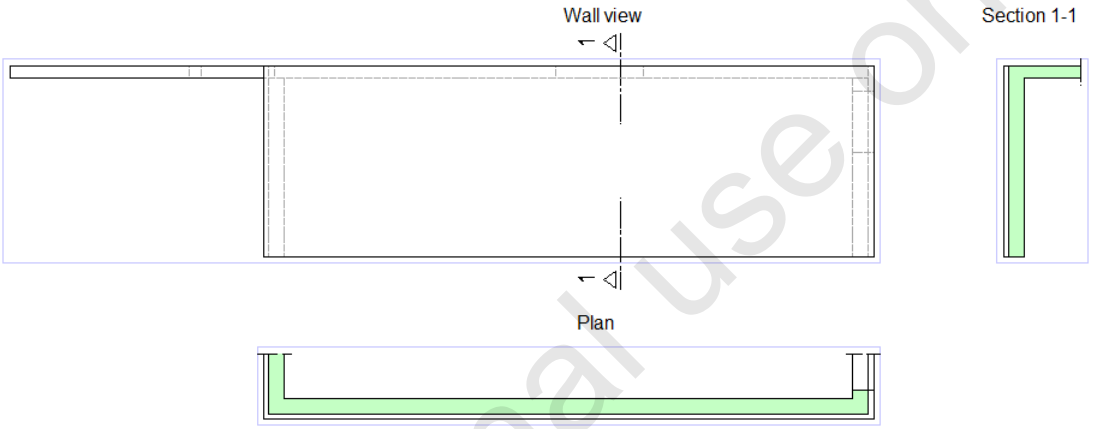


For training use only

Task 1: shell for exterior wall

Overview

To reinforce the wall, you require a front view and plan view of the wall and a section.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
Create View	**Tools** palette, **Create** area
Create Section	Shortcut menu
Modify View and Section Properties	Double-click the left mouse button

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Solution

To add new objects derived from the building structure

1 Click **Open on a Project-Specific Basis**.

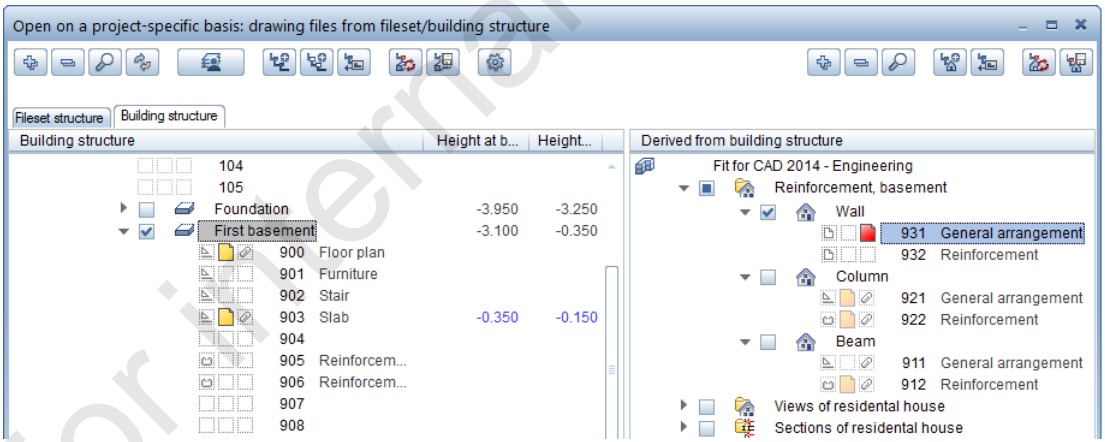
2 On the right-hand side of the dialog box, open the shortcut menu of the **Reinforcement, basement** structural level and create a new structural level. Name it **Wall**.

3 Open the shortcut menu of the **Wall** structural level, assign drawing files 931 and 932 and name them as follows:

Drawing file 931 **General arrangement**
Drawing file 932 **Reinforcement**

4 Select the **First basement** structural level in the building structure on the left-hand side of the dialog box and the **Wall** structural level on the right-hand side and make drawing file 931 current.

5 Deactivate the **Column** structural level and **Close** the dialog box.



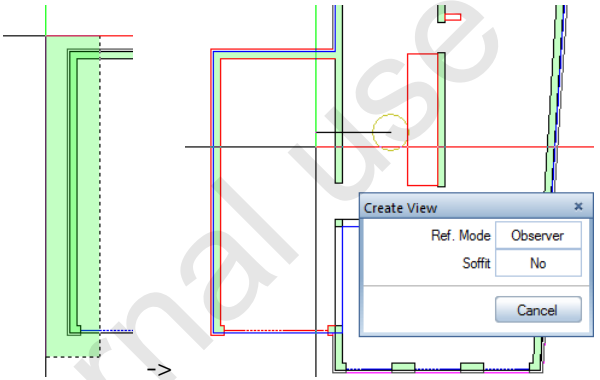
6 Set the reference scale in the status bar to **1:50** and check that the layer **SH_GEN** is still current.

For internal use only

To create the front view and sections

1 Open the **Tools** palette and click **Create View** in the **Create** area.

2 Create a view of the architectural floor plan. Set the reference mode to **Observer**, define the viewing direction by clicking to the left of the circle displayed and place the view below the floor plan.
Select the exterior wall on the left by enclosing it in a selection rectangle, which you open from right to left (the selection rectangle is dashed, and the area it covers is displayed in green).



3 Enter **View, wall** for the label of the view in the dialog line, press ENTER to confirm, place the label above the view and press ESC to quit the tool.

4 Click the view border with the right mouse button and select **Create Section** on the shortcut menu.

5 *Select 3D elements of which you want to create a section:* select the entire view you just created by enclosing it in a selection rectangle. Alternatively, click the view border.

6 Define the viewing direction by clicking to the right of the circle displayed on your screen with the crosshairs.

7 Define the clipping area in the middle of the wall in the view you just created.

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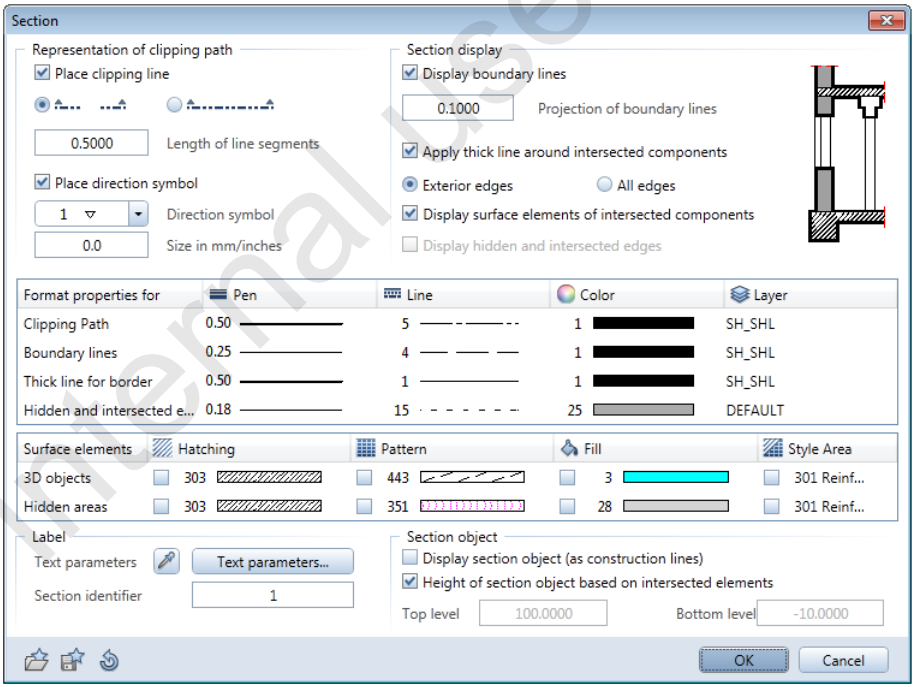
8 Click **Section settings for associative view** and make the following settings in the **Section** dialog box:

- In the **Display of clipping path** area, select the **Place clipping line** option.
- Check the **Section display** and **Section object** areas to see that the settings match those in the illustration below.
- In the **Label** area, click **Text parameters...**, set the text height to **5.0** mm and the text width to **4.0** mm. Then click **OK** to confirm the **Text Parameters** dialog box.
  Enter **1** for the section identifier and click **OK** to close the dialog box.



9 Place the section so that it is to the right of and aligned with the view.

10 *From point*: define the area in the section you created so that the entire height of the wall and the slab connections are displayed.

11 Confirm the section identifier and place it above the section.

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12 Using the same approach, create another section of the entire length of the wall. Set the reference mode to **Observer** and the viewing direction from the top. Make the following settings:

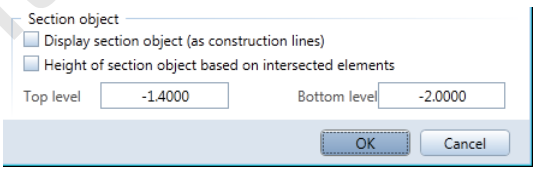
- Open the  **Section settings for associative view** and clear the **Place clipping line** check box in the **Display of clipping path** area.
- Place the section so that it is below the view and aligned with it.
- Delimit the depth of the clipping area.
- Enter **Plan** for the label in the dialog line, press ENTER to confirm and place the label above the section.

To adjust the plan section

1 Double-click the view border of the plan section with the left mouse button.

The  **Modify View and Section Properties** tool starts automatically.

2 Click  **Section settings for associative view**, clear the **Height of section object based on intersected elements** check box, enter **-1.40** for the **Top level** and **-2.00** for the **Bottom level** and click **OK** to confirm the dialog box.



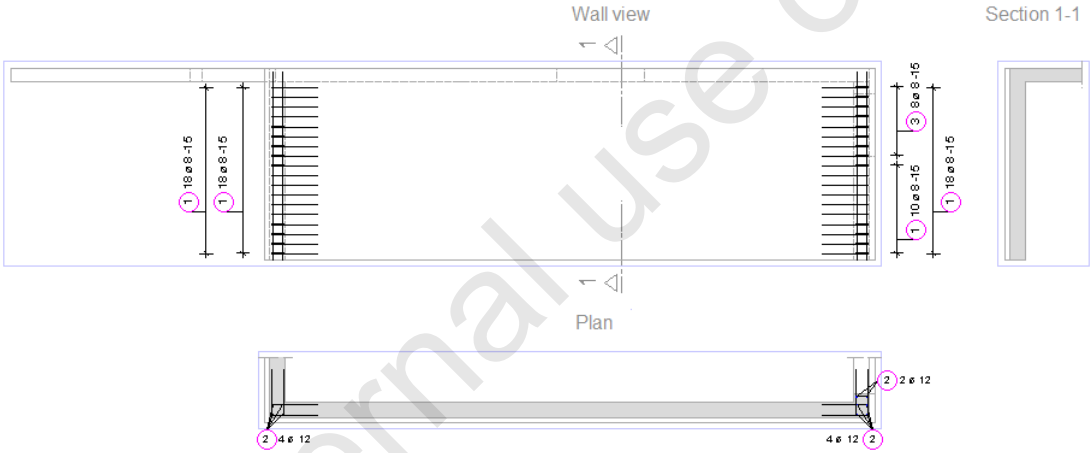
3 Click **Apply** to confirm the **View and Section Properties** Context toolbar.

For internal use only

Task 2: corner reinforcement with FF component

Overview

In this exercise you will reinforce the wall corners using a predefined component.



Use the following tool(s) to do this:

Function	How to activate it
Open on a Project-Specific Basis	**Default** toolbar
FF Components	**Repeat** menu
Dimension Line, Label	**Display** flyout
Copy and Mirror	Shortcut menu or **Edit** toolbar
Delete	**Edit** toolbar
Bar Shape	**Repeat** menu
Place Bar Shape	Shortcut menu
Dimension Line, Label	Shortcut menu

For internal use only

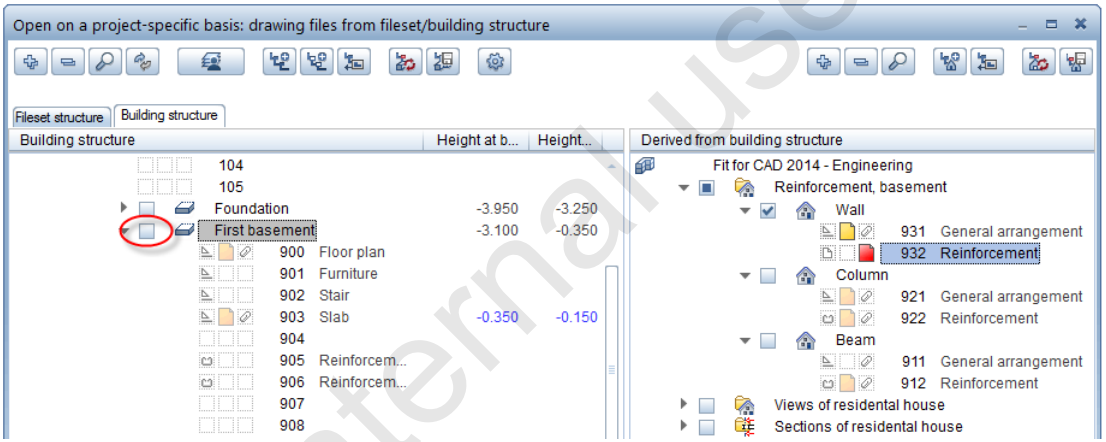
Solution

To create corner reinforcement using FF components

➲ Open the **Options, Reinforcement** page, and check that the **Reinforce with 3D model** option is active.

1 Double-click in the workspace with the left mouse button.
The dialog box for selecting drawing files and filesets opens.

2 Deactivate the **First basement** structural level in the building structure on the left-hand side of the dialog box, move to the right-hand side of the dialog box, make drawing file **932 Reinforcement** current and **Close** the dialog box.

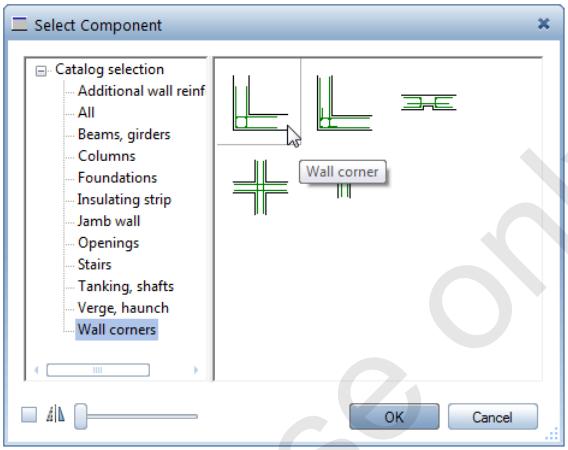


3 Check that the reference scale in the status bar is set to **1:50**.

4 On the **Repeat** menu, click **FF Components**.
Check that the layer **BR_B** is current; if it isn't, select it on the **Format** menu or toolbar.

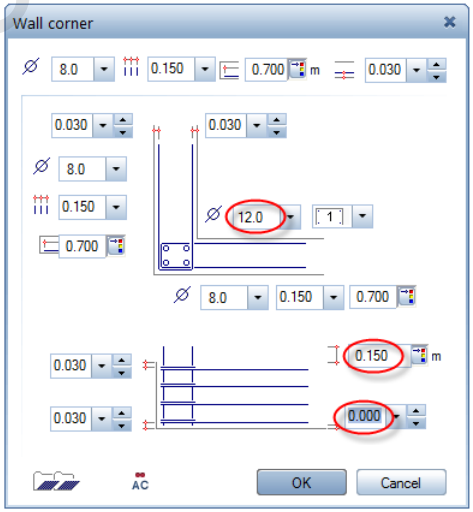
For internal use only

5 Select the **Wall corner** component.

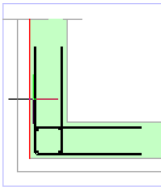


6 Set the global diameter to **8**, the global bar spacing to **0.15**, the global segment length to **0.70** and the global concrete cover to **0.03**.

7 Change the diameter of the longitudinal reinforcement to **12.0**, enter **0.150** for the anchorage length of the longitudinal reinforcement and set the concrete cover of the longitudinal bars at the start of the wall to **0.000**.



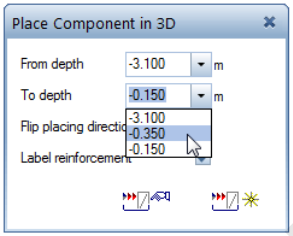
For internal use only



8 Click **OK** to confirm the settings and move the crosshairs in plan to the left component edge of the left wall corner until the component expands.

9 Click in the workspace. The entire placement is displayed in plan and in the view.

10 Open the dropdown menu for the placing depth to parameter and select
-0.350. Then click **Place automatically**.



11 Set the dimension line type to **Dimension line** and place the dimension line to the left of the wall corner in the view.

12 Place the label with the number of pieces, diameter and spacing to the left of the dimension line.

13 Press ESC twice as you do not want to label the stirrups in plan and in the reinforcement model.

14 Place the dimension line and the label for the second placement in the view.

15 Skip the prompts for the other labels of the stirrups and the longitudinal reinforcement by pressing ESC each time.

16 Use **Dimension Line, Label** (**Display** flyout) to create a common label for all four longitudinal bars in plan.
Set the dimension line type to **Fan**, select the bars by enclosing them in a selection rectangle (from left to right) and set the label's parameters so that only the number of pieces and the diameter are included.

17 Use **Copy and Mirror** (shortcut menu or **Edit** toolbar) to mirror the reinforcement you just created to the opposite corner of the wall.

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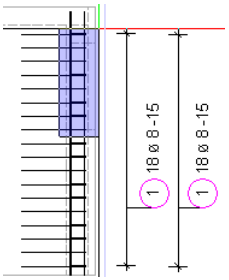


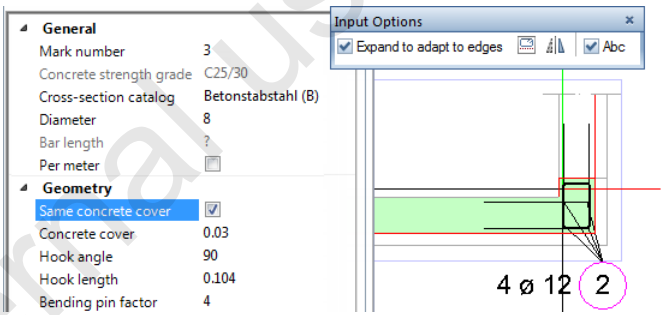
There is a window in the adjacent wall on the right. It is therefore necessary to delete the open stirrups in this area and to replace them with closed stirrups.

To create reinforcement in the area around the window

1 Click **Delete** (**Edit** toolbar) and delete the open stirrups between the bottom of the window and the bottom of the slab in the view.

2 On the **Repeat** menu, click **Bar Shape** and select the **Stirrup, closed** bending shape.

3 Make the following settings and move the crosshairs in plan to the right corner of the wall until the stirrup expands, then click in the workspace.



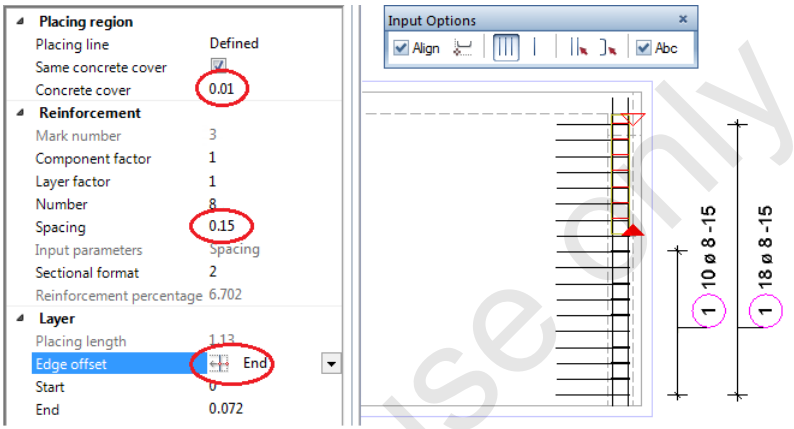
4 Click in the workspace with the right mouse button and select **Place Bar Shape** on the shortcut menu.

5 In the **Place Bar Shape** palette, select **Linear placement** in the list box at the top and define the placing line by clicking the bottom of the window andthe bottom of the slab in the view. **Align** is active in the input options.

6 In the palette, change the **Concrete cover** to **0.01** and enter **0.15** for the spacing.

For internal use only

7 Select **End** for the **Edge offset** to correctly position the placement in relation to the open stirrups. The value for the **End** is **0.072**.



8 Click in the workspace with the right mouse button and select **Dimension Line, Label** on the shortcut menu.

9 Set the dimension line type to **Dimension line** and place the dimension line.

10 Place the label with the number of pieces, diameter and spacing to the right of the dimension line.

11 If necessary, create a new label for the open stirrups at the bottom.

Tip: To create the vertical bars of the window opening, you can copy the longitudinal bars of the wall corner.

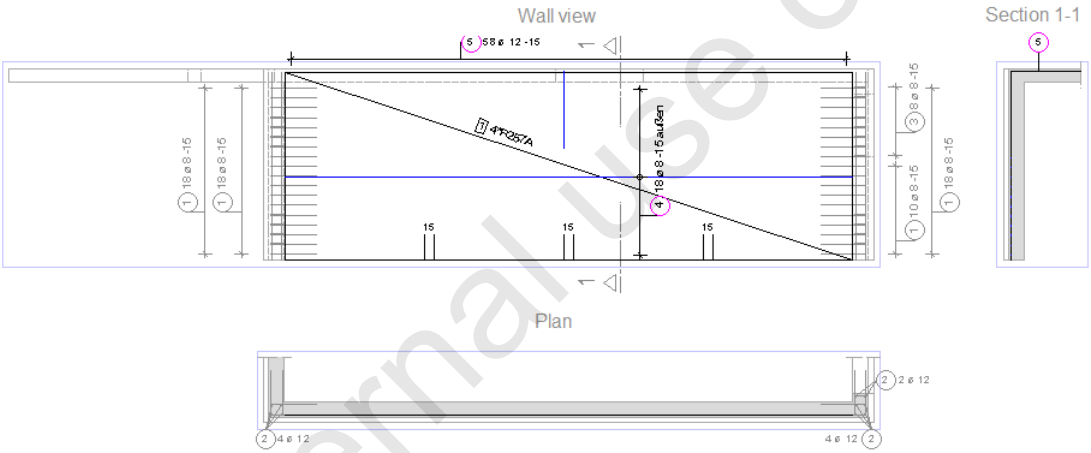
For internal use only

Task 3: exterior area reinforcement

Overview

You will use the wizard to enter the reinforcement.

The exterior reinforcement of the wall consists of basic mesh reinforcement and additional horizontal reinforcing bars. You will use L-shaped bars for the restraints to the slab.



Use the following tool(s) to do this:

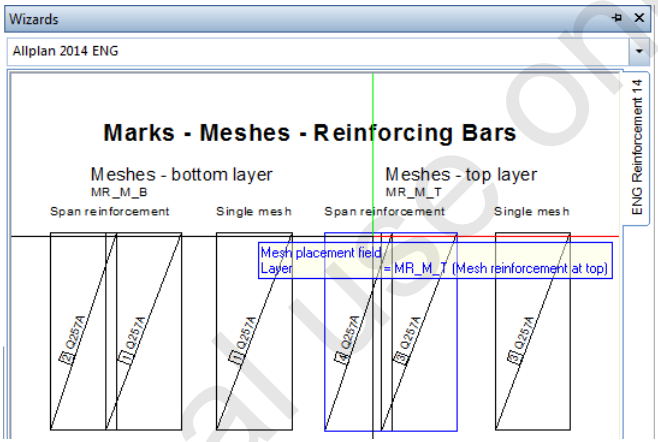
Function	How to activate it
Span Reinforcement	Wizard
Select, Set Layers	**Format** toolbar
Enter Area Reinforcement	Wizard
Bar Shape	**Repeat** menu
Label	Selected automatically
Place Bar Shape	Selected automatically
Dimension Line, Label	Shortcut menu

For internal use only

Solution

To create mesh reinforcement

1 Open the **Wizards** palette and double-click the span reinforcement under **Meshes - top layer** with the right mouse button.



The **Span Reinforcement** tool starts automatically. The layer MR_M_T is active.

2 Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **MR_M_T_1**.

3 *From point or element or enter offset:* change the support depth to **0.00** m.

4 Specify the placing polygon by clicking the bottom left point on the inside of the wall and the point where the interior edge of the wall on the right and the bottom of the slab intersect. Then press ESC to finish.

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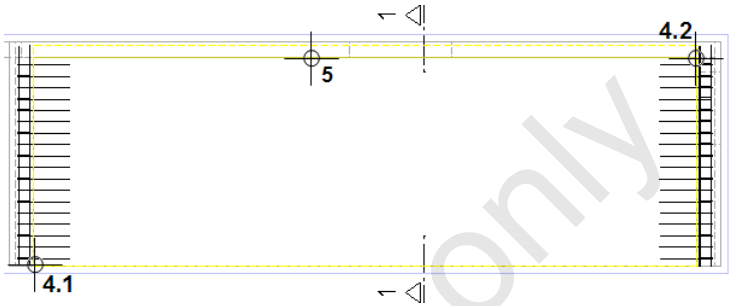
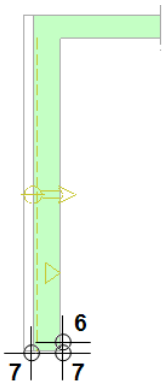
5 Change the top **Support depth** at the bottom of the slab to **0.15**.



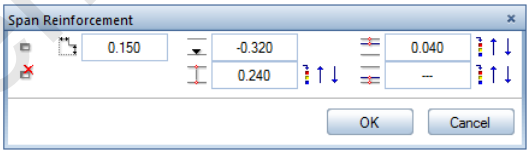


6 Click in the **Layer depth** box and click the interior base point of the wall in the section.

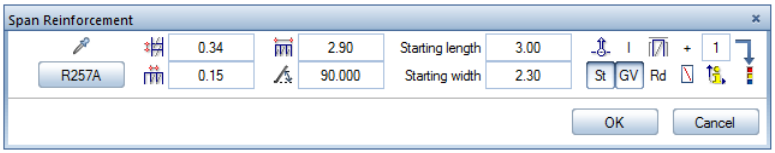
The layer depth is copied and displayed in construction line format in the section.

7 Click in the **Component thickness** box and click the wall's base point in the section to match the wall thickness.

8 Enter **0.04** for the **Concrete cover at top** and click **OK** to confirm.



9 Set the **Mesh type** to **R257A** and click **GV** to show the group symbol. Then click **OK** to confirm the settings and press ESC to quit the tool.



For internal use only

To create additional reinforcing bars

1 In the wizard, double-click the top placement under **Reinforcing bars - top layer** with the right mouse button.

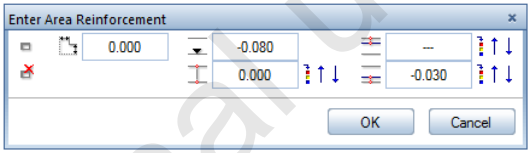
The **Enter Area Reinforcement** tool starts automatically. The layer **BR_B_T** is set.

2 Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **BR_B_T_1**.

3 Click **Span Reinforcement** on the Context toolbar.

4 Click **Match** in the input options and select the existing polygon.

5 Change the top **Support depth** at the bottom of the slab to **0,00** and the **Concrete cover at bottom** to **-0.03** and click **OK** to confirm.



6 Set the placing parameters for the transverse reinforcement:

Diameter 8

Spacing 0.15

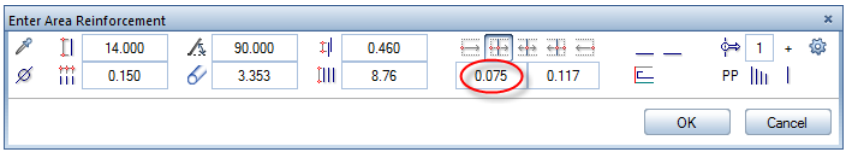
Angle of placement **0.00**

Offset to starting edge **0.075**

Shape 'straight bar'

Select **PP** (= place in polygon) at bottom right.

Set the placement display mode to **Show middle bar only**.



7 Click **OK** to confirm.

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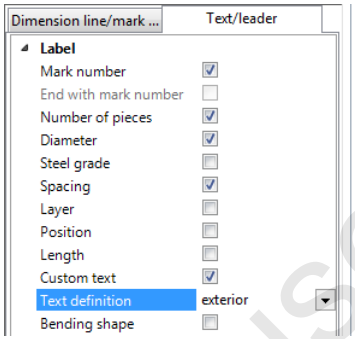
8 If necessary, set the dimension line type to **Dimension line**, select the **Bar markers** option and place the dimension line.

9 Select the **Custom text** parameter for the label, type in **exterior** in the line for the text definition, place the label and press ESC to quit the tool.

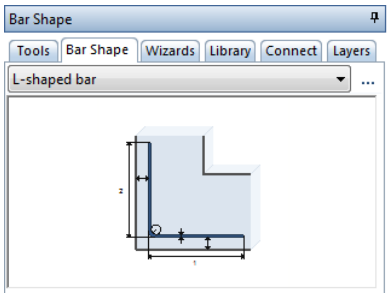


To create L-shaped bars

1 On the **Repeat** menu, click **Bar Shape**.

2 Check that the layer **BR_B_T_1** is current; if it isn't, select it on the **Format** menu or toolbar.

3 Select the **L-shaped bar** bending shape in the palette.



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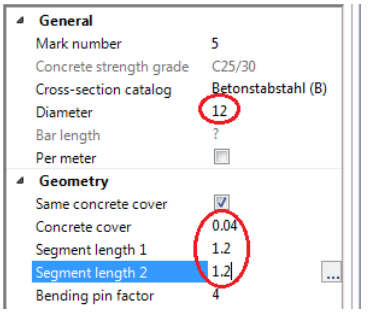
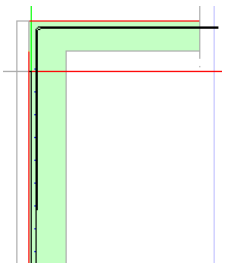
4 In the parameter area of the palette, select diameter **12**, change the value for **Concrete cover** to **0.04** and enter **1.20** for segment length 1 and segment length 2.





5 Move the crosshairs in the section to the left exterior edge of the wall until it appears in the selection color, then click in the workspace.

6 Press ESC and place the label for the L-shaped bar in the section.

The **Place Bar Shape** tool opens automatically.

7 Define the placing region between the inner corner of the wall on the left and the inner corner of the wall on the right by clicking these two points in the view. **Align** and **Show middle bar only** are selected in the input options.

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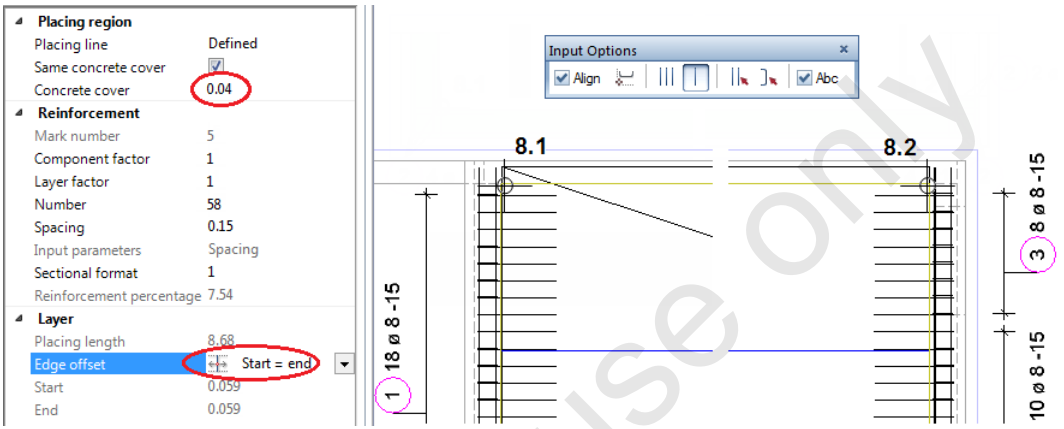
8 In the **Place Bar Shape** palette, change the **Concrete cover** to **0.04**, check that the spacing is **0.15** and select the **Start = end** setting for the **Edge offset**.



9 Click in the workspace with the right mouse button and select **Dimension Line, Label** on the shortcut menu.

10 Clear the **Bar markers** check box and place the dimension line in the view.

11 Switch off custom text by clearing the **Custom text** check box and place the label in the view.

12 Press ESC to quit the tool.

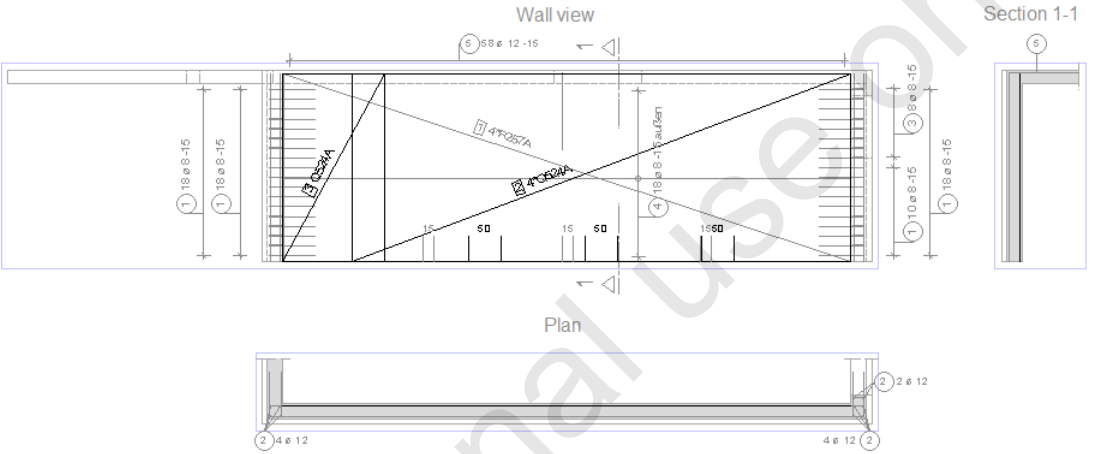
Note: If you define the placing region in plan, you cannot label the placement there as it is not in the clipping area of the plan. In addition, all the bars of the placement are displayed in the view. To change the display mode to **Show middle bar only**, you can use the **Modify Placement Display Mode** tool (**Engineering Modify** flyout).

For internal use only

Task 4: interior area reinforcement

Overview

The interior reinforcement of the wall also consists of reinforcing meshes.



Use the following tools to do this:

Tool	How to activate it
Span Reinforcement	**Repeat** menu
Select, Set Layers	**Format** toolbar

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Solution

To copy and modify the reinforcing steel mesh placement

1 On the **Repeat** menu, click **Span Reinforcement**.

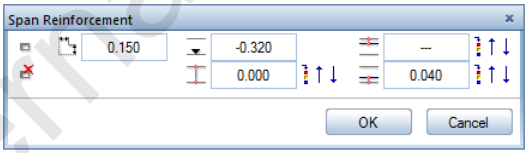
2 Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **MR_M_B_1**.

3 Click **Copy** in the Input options, select the existing shell polygon and, if necessary, change the top **Support Depth** at the bottom of the slab to **0.15**.

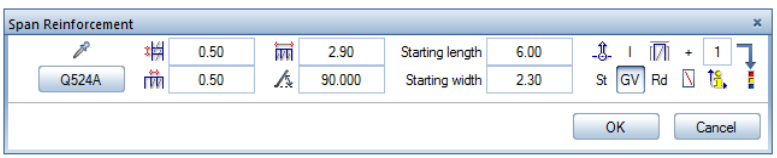
4 Click in the **Layer Depth** box and click the interior base point of the wall in the section.

Enter **0.04** for the **Concrete Cover (Bottom)** and click **OK** to confirm.

The layer depth is displayed in construction line format in the section.



5 Set the **Mesh Type** to **Q524A**, enable the **GV** group symbol and click **Toggle Direction of Diagonal**. Click **OK** to confirm the settings and press ESC to quit the tool.



Tip: If you want to place the single mesh at the start, click **Switch Start Point** or use **Get Length/Width Information** to display the width of the single mesh and enter this value for the start width.

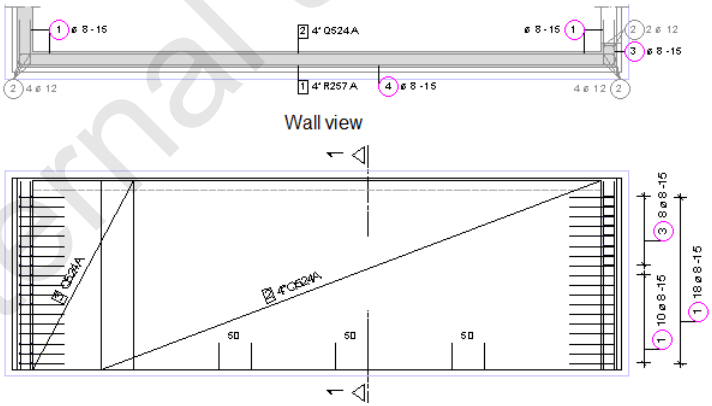
For internal use only

Task 5: displaying reinforcement layers separately

Overview

With reinforcement consisting of large volumes of data, in particular, the display of exterior and interior wall reinforcement in a single general arrangement drawing can lead to a complex representation.
So it is useful to display the two reinforcement layers separately. You have done this before with the slab reinforcement.

To separate the two reinforcement layers, you first need to copy the wall view. Then you will convert the views to sections and define the clipping area accordingly.



Use the following tool(s) to do this:

Function	How to activate it
Copy	**Edit** toolbar
Convert View to Section	Shortcut menu
Dimension Line, Label	**Display** flyout
Label	**Display** flyout

For internal use only

Solution

To convert reinforcement views to sections

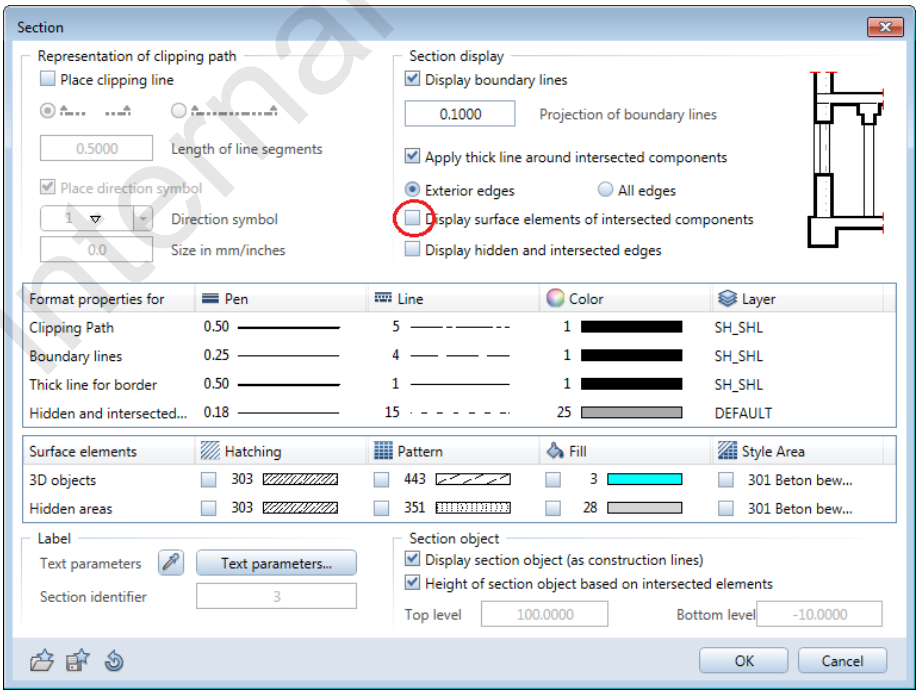
1 Double-click the view border of the view with the left mouse button and click **Yes** to confirm the message.

2 Click **Copy** (**Edit** toolbar) and select the entire wall view and its label by clicking the view border.

3 Place the new view so that it is below and aligned with the plan view and press ESC to quit the tool.

4 Click the view border of the bottom wall view with the right mouse button and select **Convert View to Section** on the shortcut menu.

5 Click **Show Clipping Path**, check that the **Place clipping line** option is not active, clear the **Display surface elements of intersected components** check box and click **OK** to confirm.



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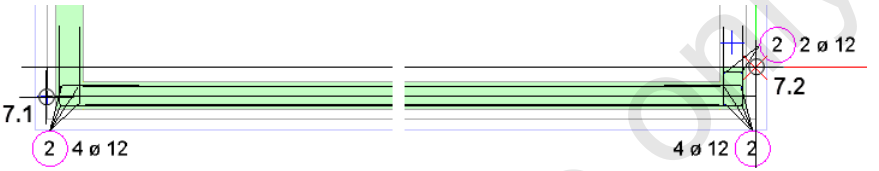
6 *From point or element*: in the bottom wall view, select the entire wall without the slab projecting on the left by clicking two diagonally opposite points. Then press ESC.

7 *From point or element*: in plan view, define an area that runs from the middle of the wall to the inside edge of the wall by clicking two diagonally opposite points. Then press ESC.



8 You do not need to enter a section identifier. Press ESC.

9 Using the same approach, convert the top wall view to a section. In plan view, define the second clipping area from the exterior edge of the wall to the middle of the wall.

Now you can only see the corner reinforcement and the exterior or interior area reinforcement in the two views. To show and hide individual placements, use **Reinforcement Tools (Display** flyout).

10 Finally, use **Dimension Line, Label** and **Label (Display** flyout) to create the missing dimension lines and labels in plan and in the section.

A note on removing elements from a view

Tip: You can use **Add to View** to add elements to views.

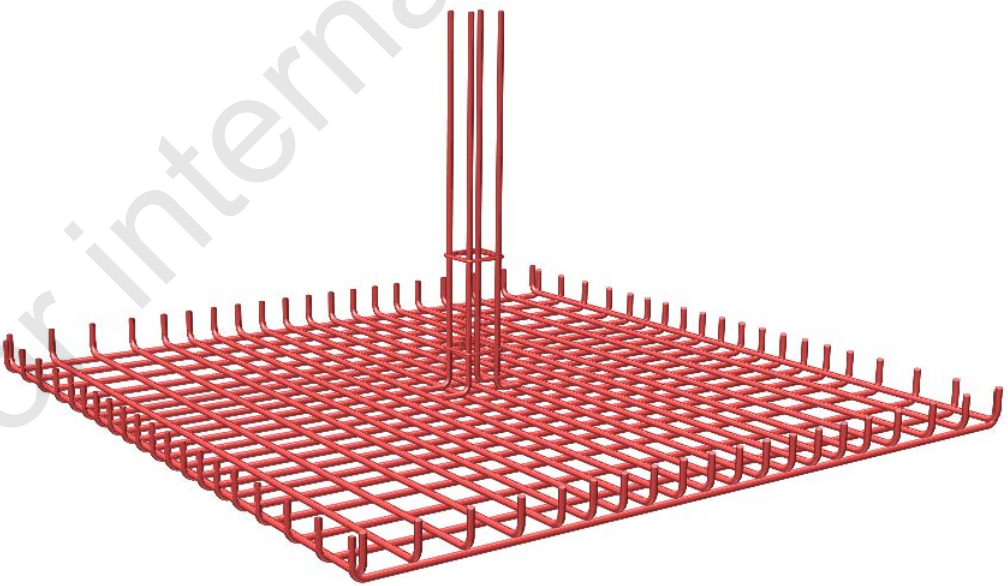
Instead of converting the two views to sections, you can also use the **Remove from View** tool to display the exterior and interior wall reinforcement separately. All you need to do is delete the relevant placements from the view. In this case, the hidden edges of the shell are always displayed.
However, new placements you create appear in both reinforcement views again.

For internal use only

Exercise 4: reinforcing the foundation

In the following exercise, you will reinforce the center-loaded foundation with the following dimensions a/b/d = 2.40/2.40/0.60 m. The dimensions of the column are 24/24 cm.

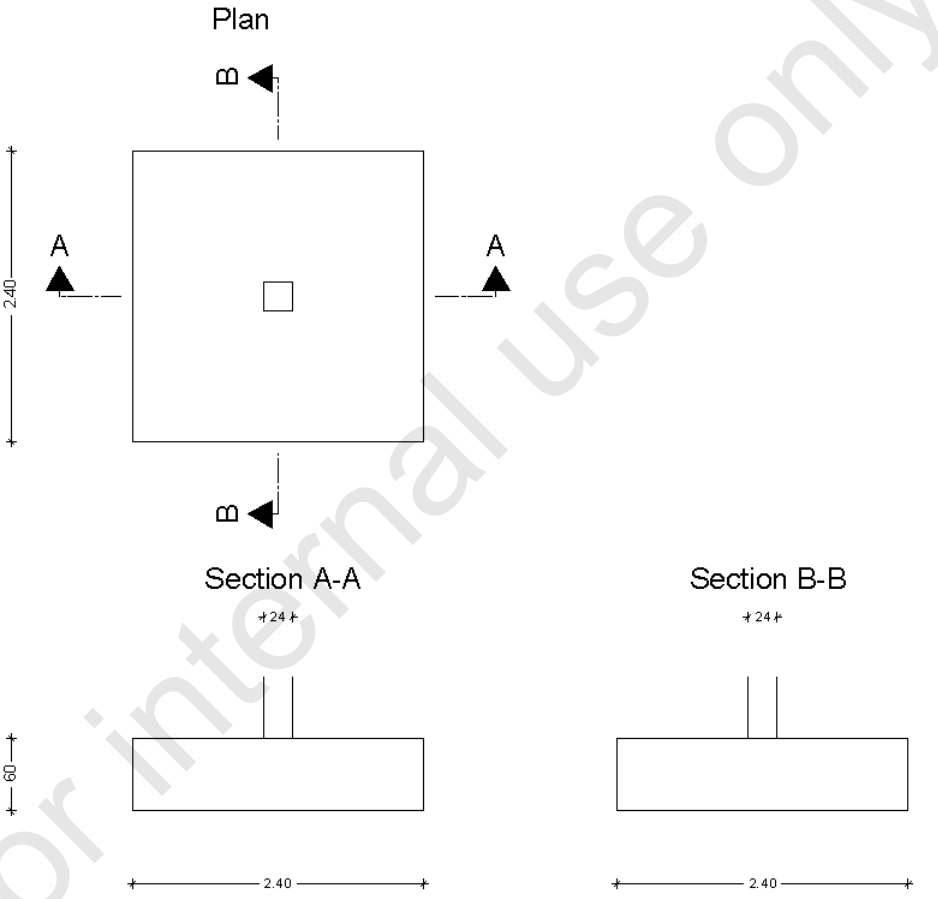
In the preceding exercises a spatial shell always served as the basis for reinforcement. In this exercise, you will create the reinforcement using a 2D shell.
First you will draw the shell using the tools in the **Draft** module. Then you will create the reinforcement as a three-dimensional model that references the 2D shell. With this approach, you can create an additional section in which the entire reinforcement is displayed. Finally, you will display the foundation reinforcement in a perspective view.



For internal use only

Task 1: 2D shell for the foundation

Overview



For internal use only

Use the following tool(s) to do this:

Function	How to activate it
 **Open on a Project-Specific Basis**	**Default** toolbar
 **Rectangle**	**Tools** palette, **Create** area
 **Select, Set Layers**	**Format** toolbar
 **Line**	**Tools** palette, **Create** area
 **Polyline**	**Tools** palette, **Create** area
 **Dimension Line**	**Tools** palette, **Create** area
 **Horizontal Text**	**Tools** palette, **Create** area
 **Select, Set Layers**	**Format** toolbar
 **Vertical Text**	**Tools** palette, **Create** area
 **Copy**	**Edit** toolbar

For internal use only

Solution

To add new objects derived from the building structure

1 Click **Open on a Project-Specific Basis.**

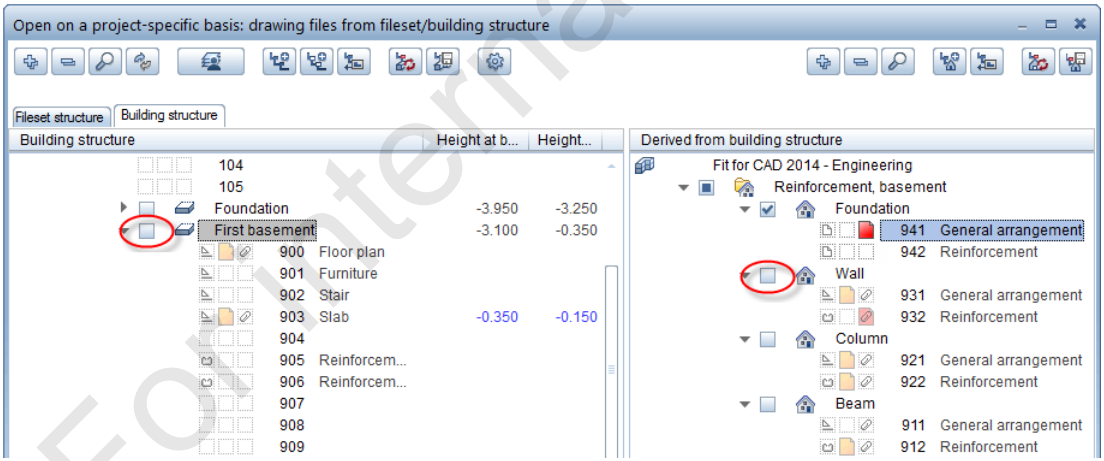
2 On the right-hand side of the dialog box, open the shortcut menu of the **Reinforcement, basement** structural level and create a new structural level. Name it **Foundation.**

3 Open the shortcut menu of the **Foundation** structural level, assign drawing files 941 and 942 and name them as follows:

Drawing file 941 **General arrangement**
Drawing file 942 **Reinforcement**

4 Deactivate the **First basement** structural level in the building structure on the left-hand side and the **Wall** structural level on the right-hand side of the dialog box.

5 Select the **Foundation** structural level, make drawing file 941 current and **Close** the dialog box.



6 Set the reference scale in the status bar to **1:25** and make the DEFAULT layer current.

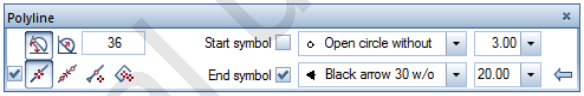
For internal use only

To create the general arrangement drawing

1 Open the **Tools** palette and select the **Basic** family.

2 Use **Rectangle** and **Line** (**Draft** module, **Create** area) to draw the floor plan and section A-A shown above.
Select the layer **DE_GEN01** for these design entities. Change the pen thickness after you have selected the tools (pen thickness **0.35** for visible edges and pen thickness **0.50** for intersected edges).

3 Use **Polyline** (**Draft** module, **Create** area) to draw the clipping lines in plan.
Use the layer **DE_GEN01** again. Select pen thickness **0.25** and line type **5**.
Select **Black arrow 30 w/o boundary lines** for the end symbol and set the symbol height to **20**.



4 Dimension the design.
After you have selected **Dimension Line** (**Dimension Lines** module, **Create** area), click **Properties**. Select the layer **DL_GEN** and open the **Text** tab, if necessary. Set the dimension text height to **3.50** and the aspect to **1.00** and specify the orientation of the dimension text relative to the dimension line.
To create dimension lines, use the **Horizontal** and **Vertical** functions.

5 Label the design (aspect: **1.00**, text height **7.00**) using **Horizontal Text** and **Vertical Text** (**Text** module, **Create** area).
Click in the **Select, Set Layers** list box (**Format** toolbar) and click the layer **TX_GEN**.

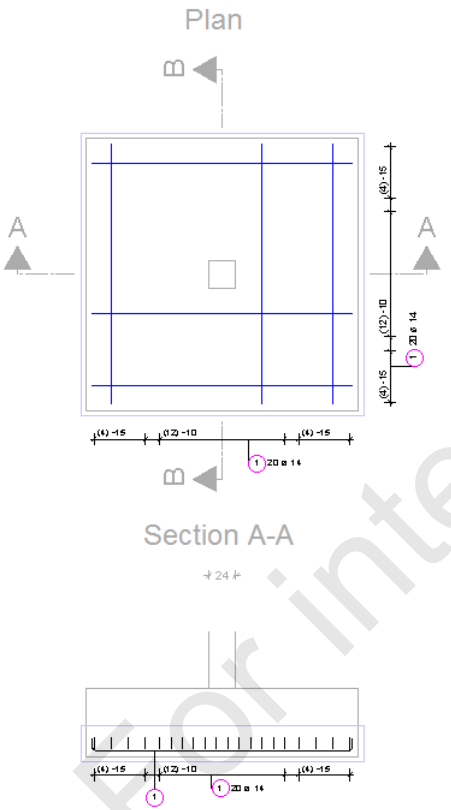
6 Use **Copy** (**Edit** toolbar) to copy section A-A, modify the section identifier and delete the dimensioning for the foundation thickness in section B-B.

For internal use only

Task 2: foundation reinforcement

Overview

The foundation reinforcement will be staggered. The bars in the outer corners of the foundation will be spaced at 15 cm intervals and in the center at 10 cm intervals.



Use the following tool(s) to do this:

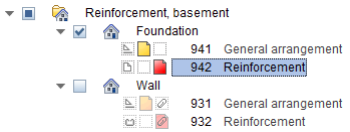
Function	How to activate it
Bar Shape	**Repeat** menu
Label	Shortcut menu
Place Bar Shape	Selected automatically
Dimension Line, Label	Shortcut menu
Copy and Mirror	Shortcut menu or **Edit** toolbar
Add to View	Shortcut menu
Dimension Line, Label	**Display** flyout

For internal use only

Solution

To create staggered foundation reinforcement

➲ Open the **Options, Reinforcement** page, and check that the **Reinforce with 3D model** option is active.



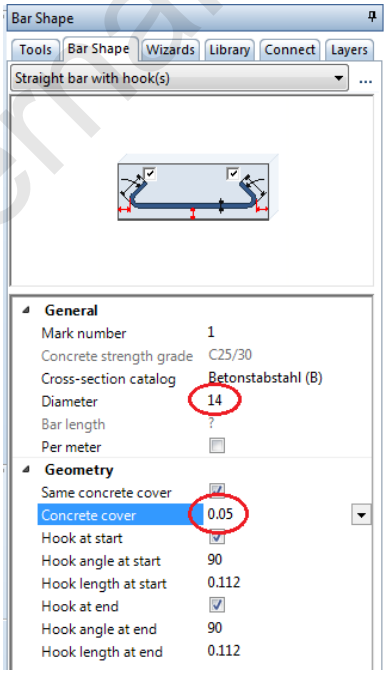
1 Make drawing file 942 current and set drawing file 941 to edit mode.

2 Check that the reference scale in the status bar is set to **1:25**.

3 On the **Repeat** menu, click **Bar Shape**.
Click in the **Select, Set Layers** list box (**Format** toolbar) and select the layer **BR_B**.

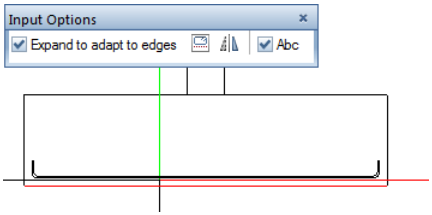
4 Select the **Straight bar with hook(s)** bending shape in the **Bar Shape** palette.

5 In the parameter area of the palette, select diameter **14** and change the **Concrete cover** to **0.05**.

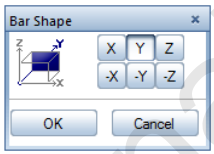


For internal use only

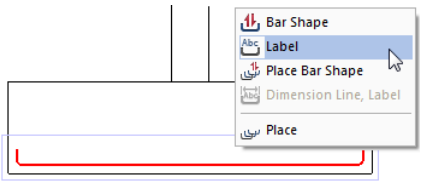
6 **Expand to adapt to edges** is active in the input options. Move the crosshairs in section A-A to the bottom edge of the foundation until it appears in the selection color, then click in the workspace.



7 *Select view for spatial orientation:* this setting defines the spatial orientation for the entire reinforcement. The bar is located in the X-Z plane and is to be placed in the Y direction. Click **Y** and confirm by clicking **OK**.



8 Click in the workspace with the right mouse button, select **Label** on the shortcut menu and place the label for the bar in the section.
Set the parameters so that only the mark number is displayed.



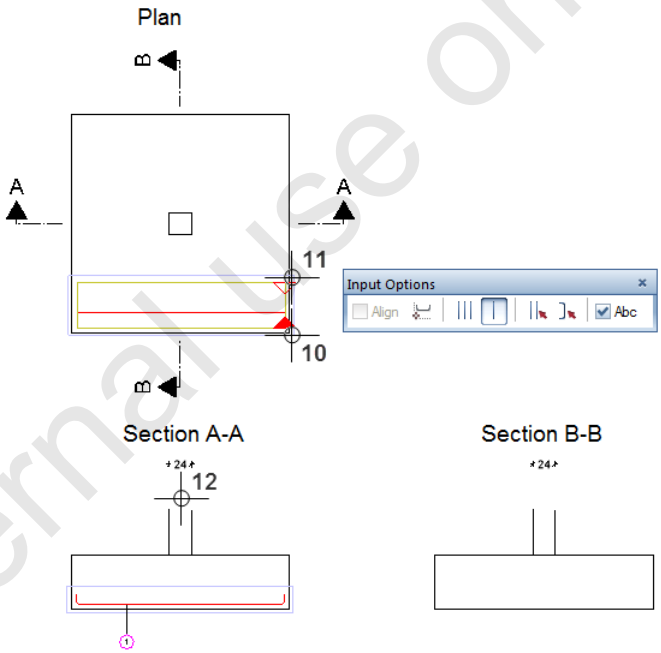
The **Place Bar Shape** tool opens automatically.

For internal use only

9 *Placing line from point:* click the bottom right corner of the foundation in plan view.

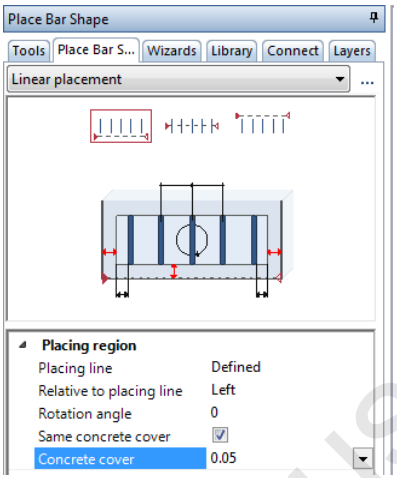
10 *Placing line to point:* enter **0.60** for the Δy **Y coordinate** in the dialog line and press ENTER to confirm.

11 *Select viewing direction:* click above the bar in the workspace. The placed area is selected (marked) and you can see already whether the bar is located in the correct position.

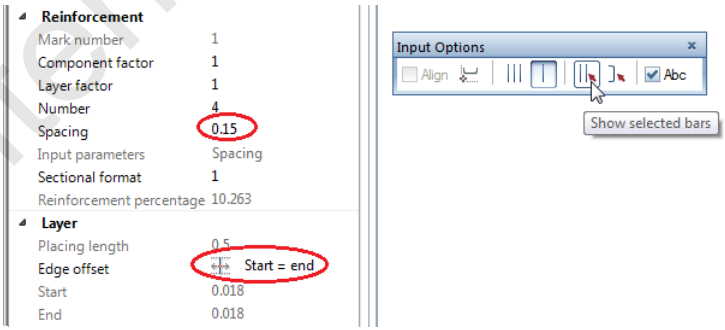


For internal use only

12 In the **Place Bar Shape** palette, change the **Concrete cover** to **0.05**.



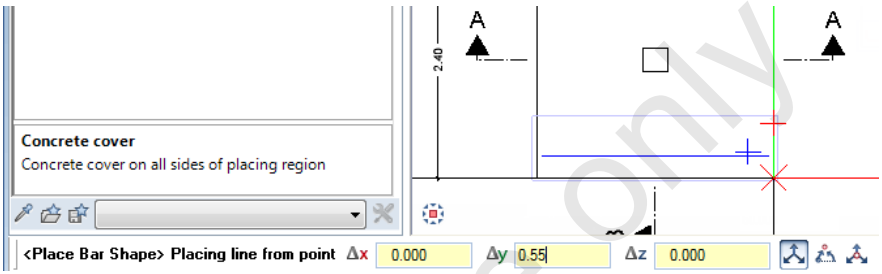
13 Check the parameter area of the palette to see whether the spacing is **0.15** and the **Start = end** setting is selected for the **Edge offset**. In the input options set the display mode to **Show selected bars**.



14 *Select the bar you want to display:* select a bar and press ESC twice.

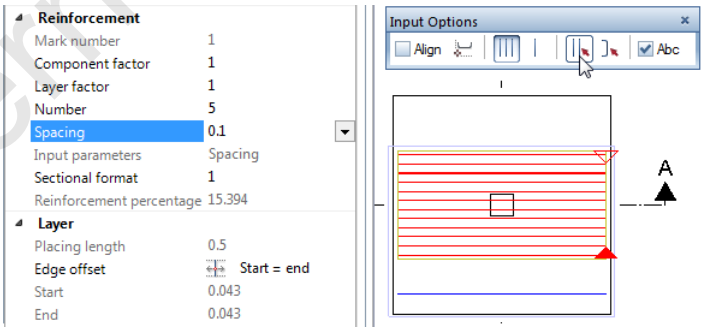
For internal use only

15 *Placing line from point:* in plan, point to the bottom right corner of the foundation so that the boxes in the dialog line appear yellow, enter **0.55** for the **Y coordinate** and press ENTER to confirm.



16 *Placing line to point:* enter **1.30** for the **Y coordinate** and press ENTER to confirm. Make sure that the data entry boxes in the dialog line are not highlighted in yellow when you enter the value for the Y coordinate.

17 In the **Place Bar Shape** palette, change the spacing to **0.10**. In the input options select **Show selected bars** again.



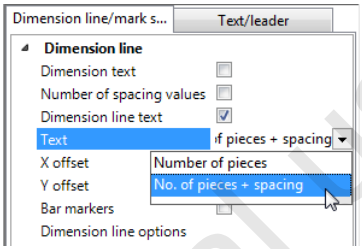
18 Select a bar, press ESC twice and specify the start point of the last placement using the procedure previously described: point to the bottom right corner of the foundation so that the boxes in the dialog line appear yellow and enter **1.80** for the **Y coordinate**.

For internal use only

19 To define the end point of the last placement, click the top right corner of the foundation, change the spacing to **0.15** and, in the input options, select **Show selected bars** again.

20 Select a bar, press ESC to finish selecting the bars for display and select **Dimension Line, Label** on the shortcut menu.

21 Set the dimension line type to **Dimension line**, select the **Dimension line text** option and choose **No. of pieces + spacing** for the text so that the number of bars and the spacing between the individual regions are displayed in the common dimension line.



22 Place the dimension line and the label. Set the label parameters so that only the number of pieces and the diameter are displayed.

23 As the foundation is square, with two-way reinforcement, you can create the second reinforcement layer by mirroring the existing reinforcement in plan view with **Copy and Mirror** and then move it upward by dz = **0.015** m (using **Z coordinate** in the dialog line).

24 Click a view border with the right mouse button, select **Add to View** on the shortcut menu and press CTRL+A twice to add all placements to section A-A..

25 Use **Dimension Line, Label** (**Display** flyout) to create a common label for all placements of the mirrored reinforcement in plan and in section A-A as described above.

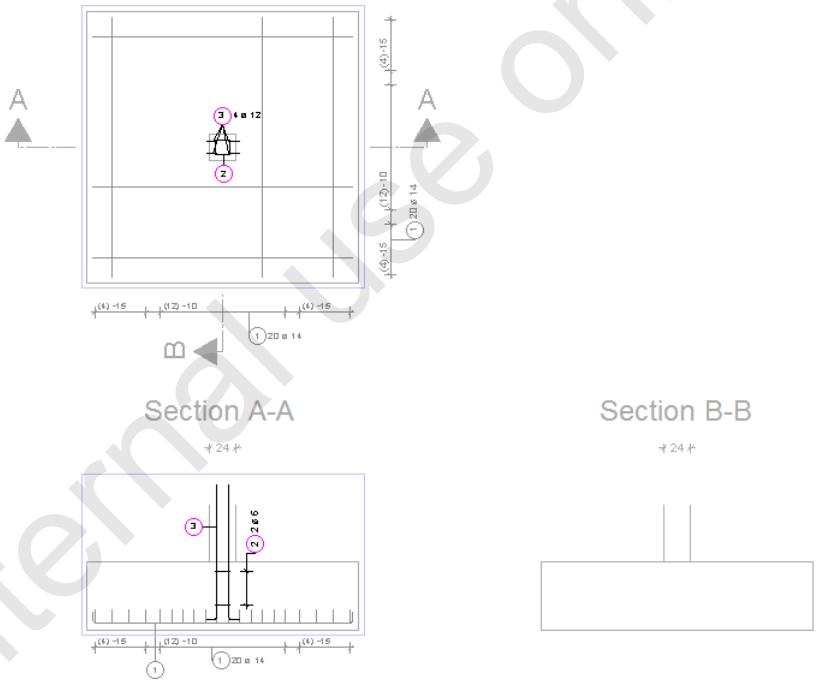
Tip: You can use **Modify Placement Display Mode** (**Engineering Modify** flyout) to select a different placement display mode in plan or in the section.

For internal use only

Task 3: starter bars for column

Overview

You will create four longitudinal bars (mark 3) for the column, with two erection bars (mark 2) to hold them.



Use the following tool(s) to do this:

Function	How to activate it
Bar Shape	**Repeat** menu
Label	Shortcut menu
Place Bar Shape	Selected automatically
Dimension Line, Label	Shortcut menu
Add to View	**Repeat** menu

For internal use only

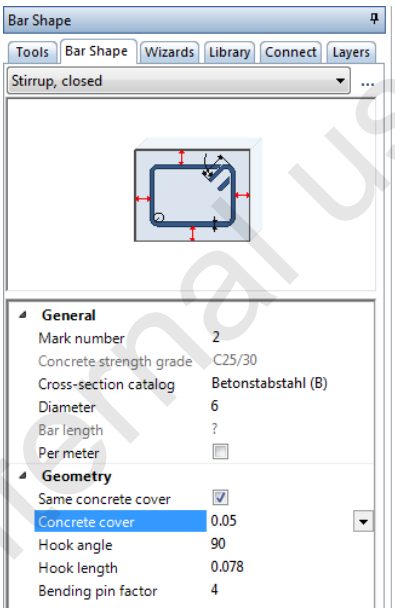
Solution

To create starter bars for the column

1 On the **Repeat** menu, click **Bar Shape**.
Check that the layer **BR_B** is current; if it isn't, select it on the **Format** menu or toolbar.

2 Select the **Stirrup, closed** bending shape.

3 In the parameter area of the palette, select diameter **6** and change the **Concrete cover** to **0.05**.

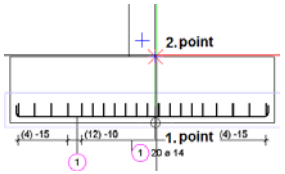


4 Move the crosshairs into the column in plan until the bending shape expands, then click in the workspace.

5 Click in the workspace with the right mouse button, select **Label** on the shortcut menu and place the label for the bar in plan.

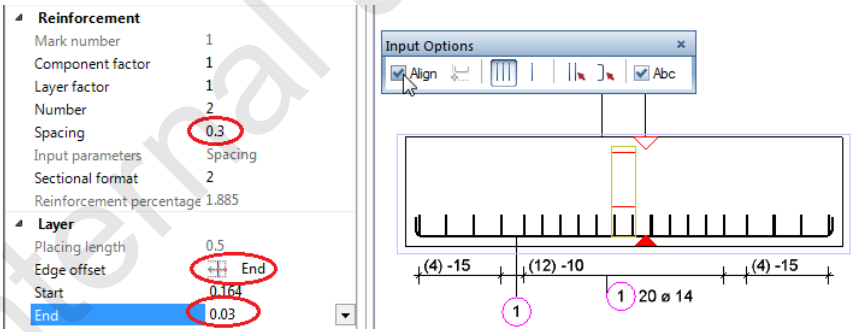
For internal use only

6 Define the placing region in section A-A by first clicking the point where the bottom edge of the foundation and the right-hand edge of the column intersect, and then clicking the point where the top edge of the foundation and right-hand side of the column intersect.



7 Select the **Align** option in the input options.

8 In the **Place Bar Shape** palette, change the spacing to **0.30**, select the **End** setting for the **Edge offset** and enter the value **0.03** for the **End**.



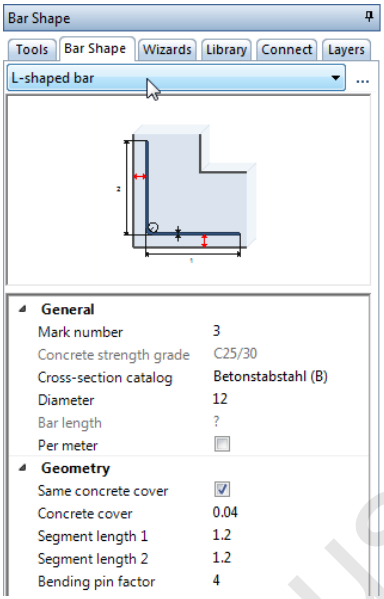
9 Select **Dimension Line, Label** on the shortcut menu and clear the **Dimension line text** check box.

10 Place the dimension line and the label.

The **Bar Shape** tool is still active.

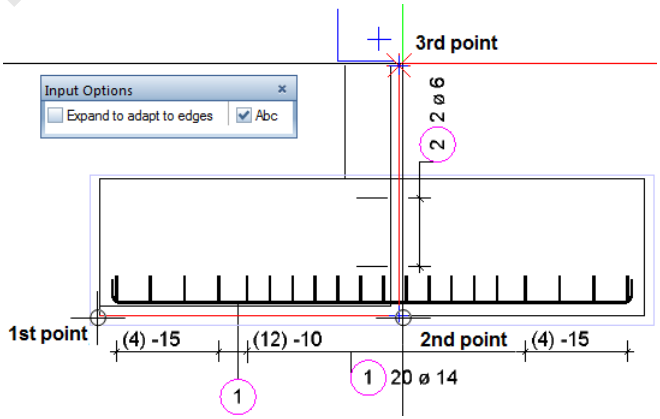
11 Select the **L-shaped bar** bending shape in the **Bar Shape** palette.

For internal use only



12 Leave all the settings as they are and clear the **Expand to adapt to edges** check box in the input options.

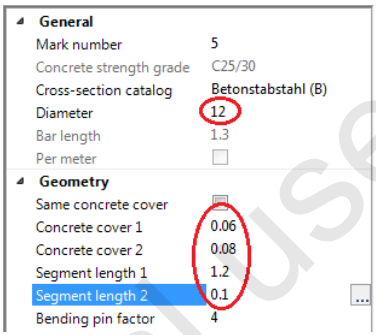
13 To define the bending shape, click the following points in section A-A: for the first point, click the bottom left corner of the foundation. For the second point, click the point where the bottom edge of the foundation and the right-hand edge of the column intersect. Finally, to specify the third point, click the top right point of the column indicated.



For internal use only

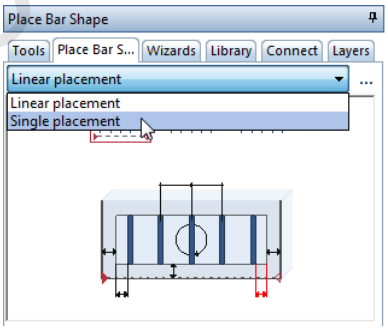
14 Now define the final parameters in the **Bar Shape** palette.
Any changes you make are immediately displayed in the preview.

Diameter: **12**
Clear the **Same concrete covers** check box
Concrete cover 1: **0.06**
Concrete cover 2: **0.08**
Segment length 1: **1.20**
Segment length 2: **0.10**



15 Press ESC and place the label for the bar in the section.

16 Select **Single placement** in the list box at the top in the **Place Bar Shape** palette.

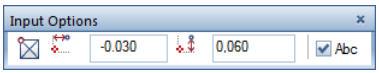


For internal use only

17 Click the view where the foundation is displayed in plan.

18 Place the four starter bars in the corners of the stirrup by clicking the corners of the column.
In the input options, enter **-0.03** for the **Offset in x direction** and **0.06** for the **Offset in y direction** and alternate the **anchor point** as necessary. To place the bars on the left, you can accept the placing angle of **0.00°**. To place the bars on the right, you need to change the placing angle to **180.00°** before you click the relevant corner of the column.

Tip: The entries you make turn the bottom segment of the L-shaped bar so that it points outwards.



19 Press ESC to finish entering the bars.

20 The dimension line type is automatically set to **Fan**. Place the common label for all starter bars in plan view.

21 Press ESC to finish creating starter bars.

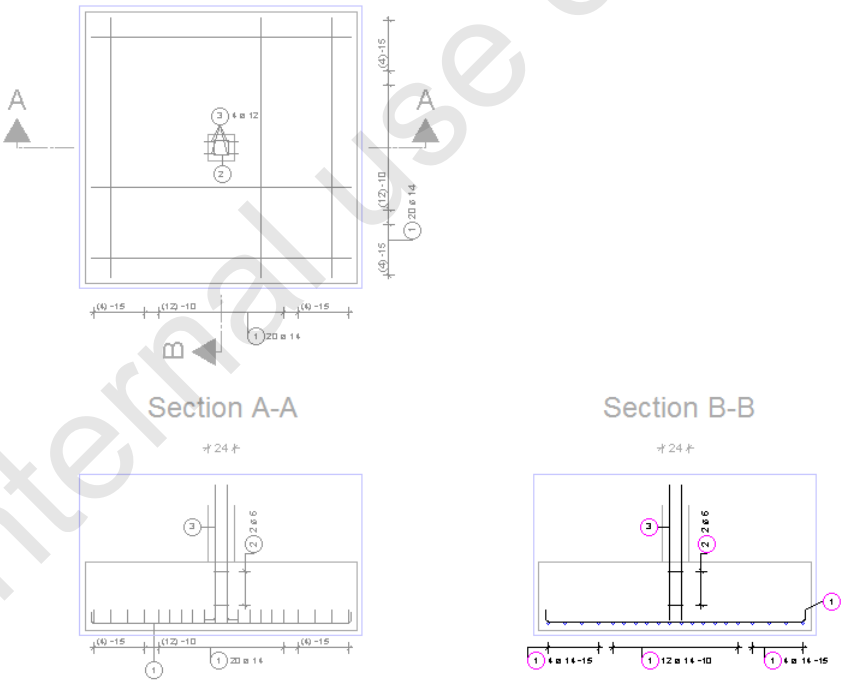
22 Use **Add to View** again to add all starter bars to section A-A.

For internal use only

Task 4: reinforcement in section B-B

Overview

While you were creating the reinforcement, no display in section B-B was generated as the shell is not 3D. The reinforcement itself, however, exists as a three-dimensional model. This means that you can create a new section with the entire reinforcement and place it in the shell of section B-B.



Use the following tools to do this:

Tool	How to activate it
Create Section	Shortcut menu
Reinforcement Tools	**Display** flyout

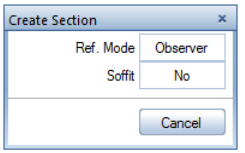
For internal use only

Solution

To create reinforcement in section B-B

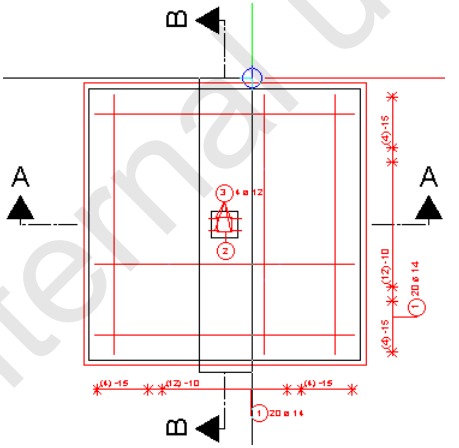
1 Click a view border in plan or in the section with the right mouse button and choose **Create Section** on the shortcut menu.

2 *Select 3D elements of which you want to create a section:* click the view where the foundation is displayed in plan.

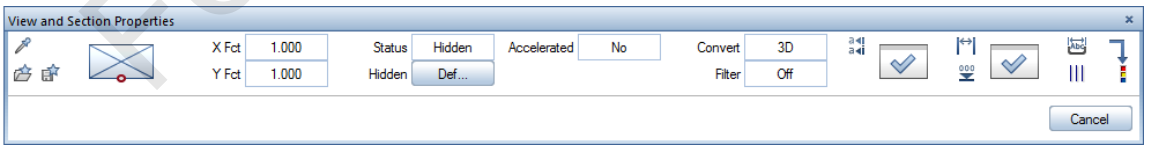


3 Set the reference mode to **Observer** and define the viewing direction by clicking to the right of the circle displayed in your drawing with the crosshairs.

4 Define a clipping area in plan and, if necessary, clear the **Place clipping line** and **Display section object (as construction lines)** check boxes in the **Section settings for associative view**.



5 Set the **Anchor point** to bottom, centered.



For internal use only

6 *To point or angle of rotation:* click the bottom left corner of the foundation in section B-B with the right mouse button and select **Midpoint** on the shortcut menu.

7 *End point of line:* enter **0.057** for the **Y coordinate** in the dialog line and click the bottom right corner of the foundation.

8 *From point:* press ESC twice.

9 Finally, you can use the **Reinforcement Tools (Display** flyout) to automatically dimension and label section B-B by choosing **Auto**.

Select the view you want to dimension: click any placement and set the parameters for the dimension lines and labels as shown at the beginning of this task. Press ESC to skip a placement.

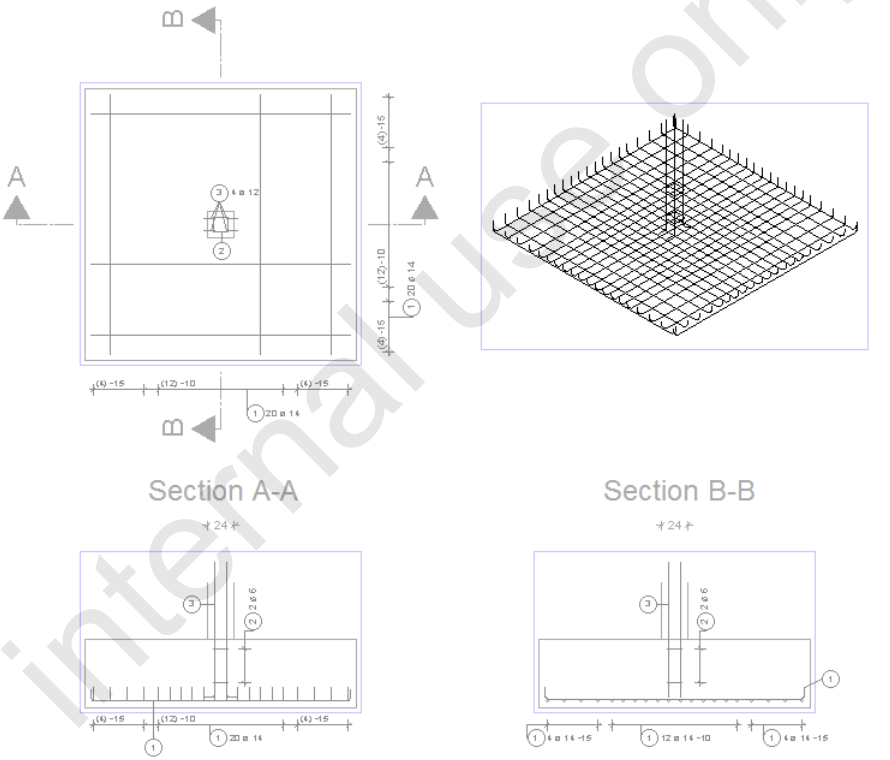
Note: In section A-A, the bars in the 2nd layer are not displayed as intersected bars like in section B-B as this is a view that is not spatially delimited.

You can use **Convert View to Section** to convert the view to a section. The procedure was described when you reinforced the other components.

For internal use only

Task 5: Perspective view of the reinforcement

Overview



Use the following tools to do this:

Tool	How to activate it
Create View	Shortcut menu
Front Left, Southwest Iso.	Toolbar in the border of the viewport
Plan	Toolbar in the border of the viewport

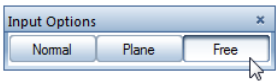
For internal use only

Solution

To create a 3D image of reinforcement

1 Click a view border in plan or in the section with the right mouse button and choose **Create View** on the shortcut menu.

2 Click **Free** in the Input options.



3 Select **Front Left, Southwest Iso.** in the border of the viewport.

4 *Select 3D elements of which you want to create a view:* select the entire foundation reinforcement.

5 Click **Plan** in the border of the viewport.

6 *To point or enter a rotation angle:* the selected isometric view is displayed attached to the crosshairs. Place it in the drawing file.

7 Press ESC twice to finish and to quit the tool.

For internal use only

For internal use only

Exercise 5: layout output

Layout output is covered in detail in Fit for CAD Basics (exercise 1 of unit 3). There are some particular issues to bear in mind when you place reinforcement drawing files with associative views in layouts.

In the following exercise you will set up a layout for the beam. You have created full schemas for this component. As full schemas are always created in the drawing file with the reinforcement model, you need to place both the drawing file with the general arrangement drawing and the drawing file with the reinforcement in the layout. As a result, the layout also contains the reinforcement model although it is not required for the layout.

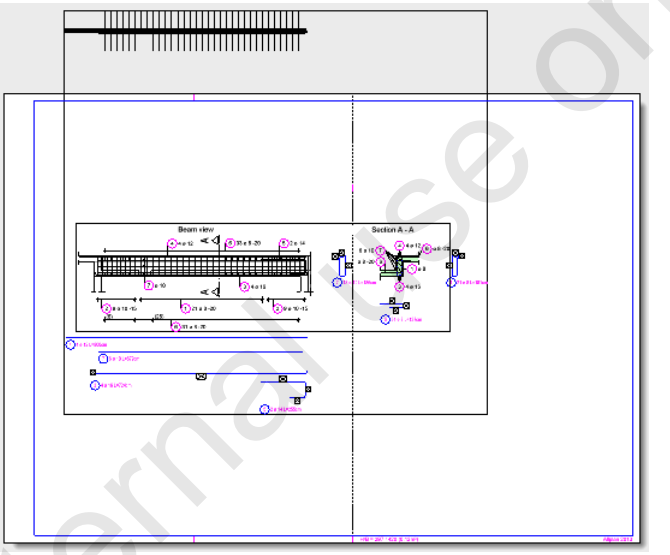
You will start by placing the drawing files. After this, you will cut them so that the reinforcement model is no longer included in the layout.

For internal use only

Task 1: assembling layouts

Overview

Start by specifying the page format and border for the layout and then select the layout elements.



Use the following tool(s) to do this:

Function	How to activate it
Layout Editor	**Default** toolbar
Open on a Project-Specific Basis	**Default** toolbar
Set Up Page	**Tools** palette, **Create** area
Layout Element	**Tools** palette, **Create** area

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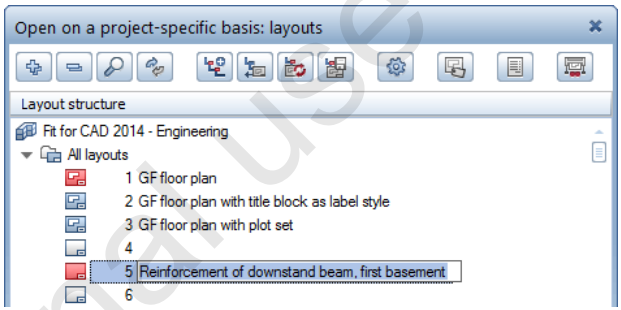
Solution

To define the page format and the border

1 Click **Layout Editor** (**Default** toolbar).
When you click this tool again, the layout editor closes and you are back in document edit mode.

2 Click **Open on a Project-Specific Basis** (**Default** toolbar).

3 Select layout **5**, press the F2 key and enter **Reinforcement of downstand beam, first basement** for the name of the layout and click **Close** to confirm the dialog box.



4 Open the **Tools** palette, click **Set Up Page** in the **Create** area and move the cursor out of the palette.

The setting makes sure that the **Set up page** palette remains visible all the time.

5 Define the format and its orientation in the **Page** area, specify the type and, if necessary, size of the **Margins** and click **OK** to confirm.

Using the setting you make for the margins, Allplan always places the page so that its bottom left corner coincides with the bottom left corner of the printable area of the printer you have specified in the **Print Layouts** tool. This ensures that the printout includes all the elements that extend as far as the margins of the page.

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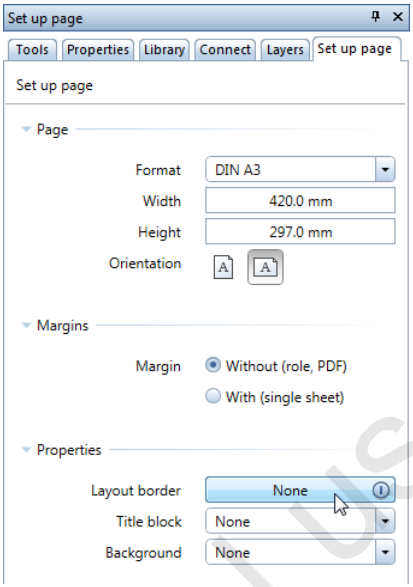
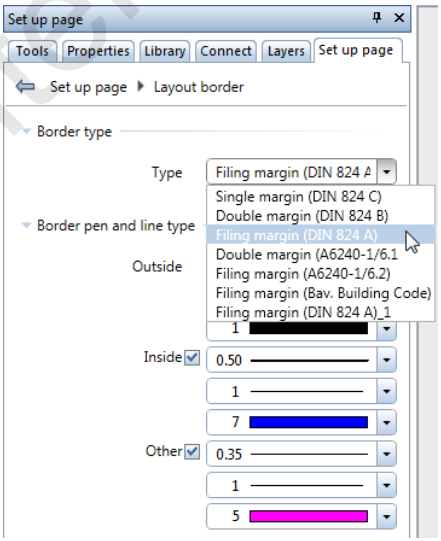
6 Click the **Layout border** button in the **Properties** area.



7 Set the border type to **Filing margin (DIN 824 A)**, change the format properties of the layout border, if necessary, and click **Close** to return to the **Set up page** palette.



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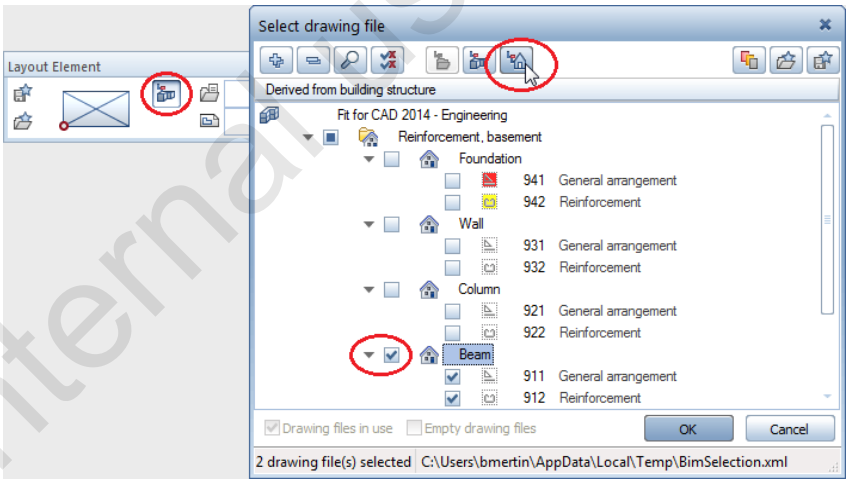
Note: If you want to place a layout border of any size on the page, use the **Layout Border** tool (**Tools** palette, **Create** area). Here, you can define custom border sizes using the input options.

8 Click **Close** to quit the **Set Up Page** tool.

To place layout elements

1 Open the **Tools** palette and click **Layout Element** in the **Create** area.

2 Click **Building structure** on the **Layout Element** Context toolbar and click **Derived from building structure** in the **Select drawing file** dialog box.



Note: You do not need to select the architectural data as it is not part of the layout.

3 Select the **Beam** structural level and confirm the dialog box by clicking **OK**.

4 Click in the **Layer/print set** box. Set the drawing type to **Reinforcement drawing** and select the **List layers in layout element** and **Fixed, save layer setting in layout element (fixed)** settings.

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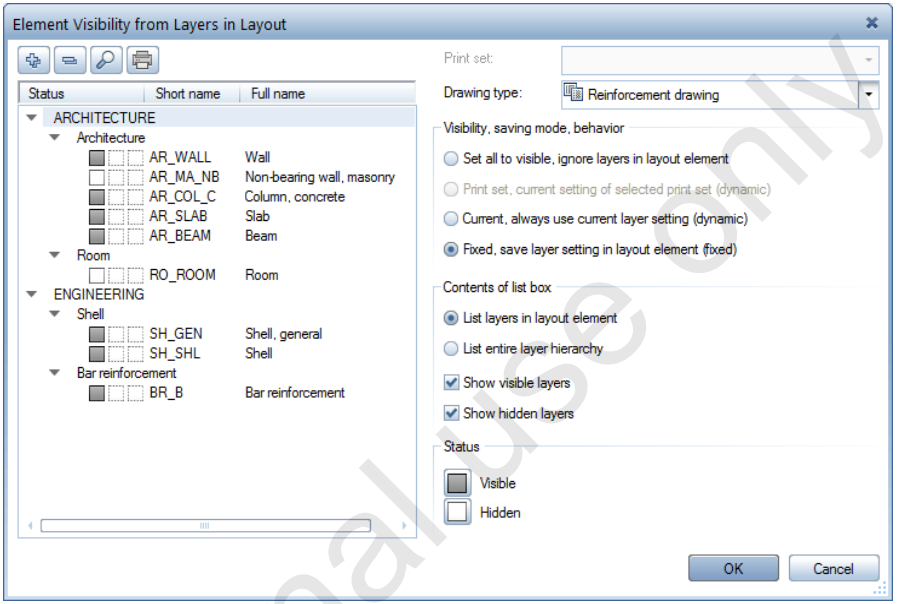
5 If necessary, set the layers that are not included in the elements you want to print to Hidden and click **OK** to confirm the dialog box.



6 Place the selected drawing files in the layout so that the reinforcement model is outside the layout border. If necessary, move the layout elements using Move (**Edit** toolbar).

7 Press ESC to finish selecting layout elements.

Note: If you create partial schemas instead of full schemas and select the placements in the associative views and sections, the partial schemas will be created in the general arrangement drawing files. In this case, it would be enough if you placed the general arrangement drawing files in the layout.

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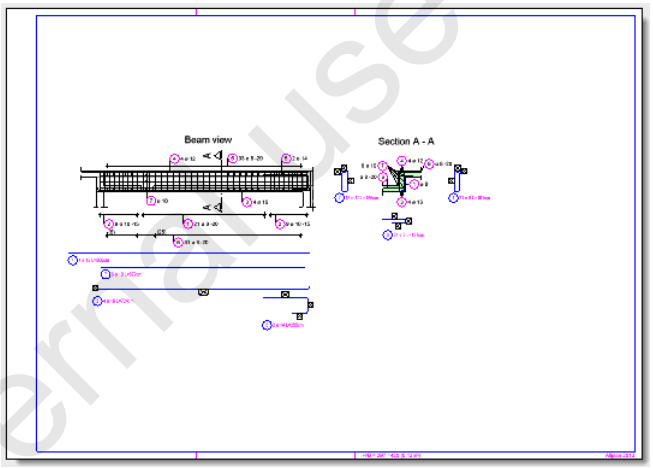
Task 2: excluding the reinforcement model from the layout

Overview

The printout only includes the elements that are within the printable area of the page and of the output device. But the print preview displays all elements. You can use a layout section or layout window to hide the reinforcement model.



Use the following tool(s) to do this:

Function	How to activate it
Convert Layout Section	**Tools** palette, **Create** area
Load Layout Section or Layout	**Tools** palette, **Change** area
Move	**Edit** toolbar
Load Original Layout	**Tools** palette, **Change** area
Layout Window	**Tools** palette, **Create** area

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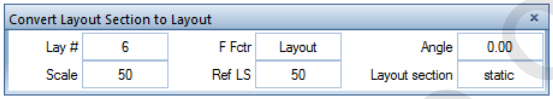
Solution

To create a layout section

1 Open the **Tools** palette, select the **Crop Layout** module and click **Convert Layout Section** in the **Create** area.

2 Select layout **6** and set the **Scale** and **Ref LS** (reference layout scale) to **50**.



3 Click an element of the layout border.

Allplan issues a message to point out that the section has been created.

Note: To create sections of smaller areas of the layout, use **Layout Border** to place a layout border of the size you require and click it. This way, you can also cut large layouts into smaller "sub-layouts"!.

4 Open the **Tools** palette and click **Load Layout Section or Layout** in the **Change** area.

5 Click **LayNam** in the input options and select layout **6**.

6 If necessary, move the entire layout so that the bottom left corner of the layout border coincides with the bottom left corner of the page.

7 Open the **Tools** palette and click **Load Original Layout** in the **Change** area.

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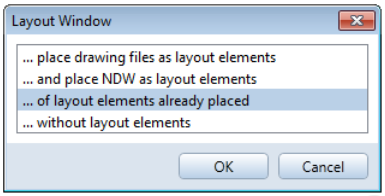
To create layout windows

1 Open the **Tools** palette, select the **Layout** module and click **Layout Window** in the **Create** area.

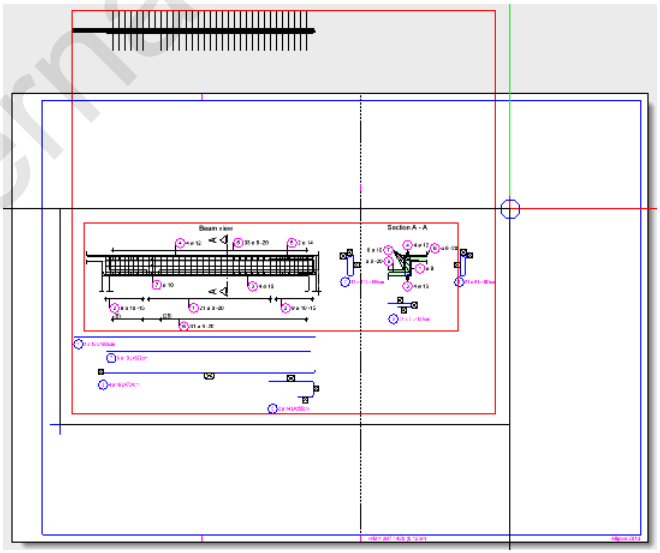
2 Select **... of layout elements already placed.**



3 Select both layout elements by enclosing them in a selection rectangle.

Tip: Using the polyline entry tools, you can also define freeform layout windows or create .

4 To define the size of the layout window, click two diagonal points (at bottom left and top right) so that the reinforcement model is outside the layout window.



5 Press ESC twice to finish entering the layout window and to quit the tool.

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