

ALLPLAN 2020

Basics Tutorial

Basics Tutorial

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Before You Start ...

This tutorial is designed to give you a quick and practical introduction to all the important tools for designing and modifying in Allplan 2020.

It contains several examples in the form of exercises. These are used to show how to design in 2D and how to get started in 3D modeling.

Requirements

This guide assumes that you are familiar with and have a working knowledge of Windows and Allplan 2020.

The basics are covered in the manual. In particular, you should know

- How to start and exit Allplan 2020
- How to create projects
- How to open and close drawing files and how to set drawing files to edit or reference mode
- How to control the on-screen display; in particular how to refresh your drawing and zoom in on details

You should work through the exercises in the given sequence as tools that are presented in more detail in the earlier exercises are only referred to by name in later exercises.

Feedback

We are always trying to improve the overall quality of our program documentation. Your comments and suggestions are important to us and we welcome feedback.

Please do not hesitate to contact us to express criticism or praise concerning the documentation. Feel free to contact us as follows:



Documentation

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Werinherstr. 79, Eingang 32 d
81829 Munich, Germany

Email: dokumentation@allplan.com


Sources of information

Documentation for Allplan consists of the following parts:

- The help is the main source of information for learning about and working with Allplan.
While you work with Allplan, you can get help on the current tool by pressing the F1 key, or activate  **What's This** in the  **Help** dropdown list (title bar on the right) and click the icon on which you require help.
- The **Manual** consists of two parts. The first part shows how to install Allplan. The second part is designed to provide an overview of basic concepts and terms in Allplan and introduce approaches for entering data in Allplan.
- The **Basics Tutorial** guides you step by step through the most important tools for designing and modifying elements in Allplan.
- The **Architecture Tutorial** guides you step by step through the process of designing a building. In addition, you will learn how to analyze the building data using reports and to print the results.
- The **Engineering Tutorial** guides you step by step through the process of creating key plans, general arrangement drawings and reinforcement drawings and shows you how to print the results.
- **New Features In Allplan 2020** provide information on what's new in the latest version.
- Each volume in the **Step-by-Step** series deals with a specific concept or series of tools or modules in Allplan in detail. The areas covered include data exchange, system administration, geodesy, presentation, 3D modeling and so on. As a Serviceplus member, you can download these guides as PDF files from the Training – Documentation area of Allplan Connect (<http://connect.allplan.com>).
- You can also find numerous publications on social networks.

Additional Help

Tips for efficient usage

The  **Help** dropdown list (title bar on the right) provides **Tips for Efficient Usage**. This topic includes practical tips and tricks showing you how to use Allplan efficiently and how to carry out operations with ease.

User forum (for Serviceplus customers)

Allplan forum in Allplan Connect: Users exchange information, valuable tips relating to everyday work and advice on specific tasks. Register now at connect.allplan.com

On the Internet: solutions to frequently asked questions

You can find solutions to numerous questions answered by the technical support team in the comprehensive knowledge database at connect.allplan.com/faq

Feedback on the help

If you have suggestions or questions on the help, or if you come across an error, send an email to: dokumentation@allplan.com

Training, Coaching and Project Support

The type of training you are given is a decisive factor in the amount of time you actually spend working on your own projects: A professional introduction to the programs and advanced seminars for advanced users can save you up to 35% of your editing time!

A tailor-made training strategy is essential. Our authorized seminar centers offer an extensive range of programs and are happy to work out a custom solution with you that will address your own needs and requirements:

- Our **sophisticated, comprehensive seminar program** is the quickest way for professional users to learn how to use the new system.
- **Special seminars** are designed for users who want to extend and optimize their knowledge.
- **One-on-one seminars** are best when it comes to addressing your own particular methods of working.
- One-day **crash courses**, designed for office heads, convey the essentials in a compact format.
- We are also happy to hold seminars on your premises: These not only encompass Allplan issues but also include analysis and optimization of processes and project organization.

For more detailed information on the current training program, please consult our online seminar guide you can find on our homepage (<http://www.allplan.com/de/events/termine/schulungen-kurse-cad-ava-d2c-fm.html>).

Unit 1: Introduction

This unit briefly introduces the seven exercises in this tutorial.

You will create a separate project for these exercises. Then you will make basic settings which apply to all the exercises.

A short troubleshooting section is provided at the end to make sure you succeed.


Objectives

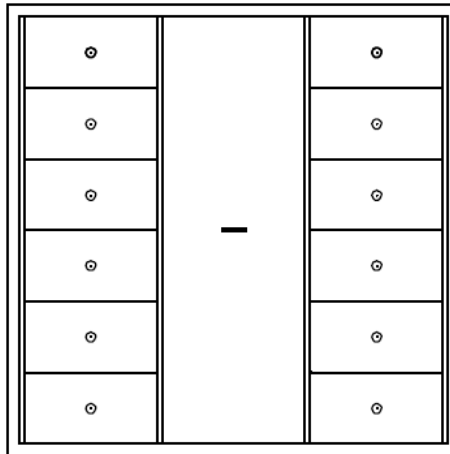
The Actionbar configuration (on page 23) is set by default in Allplan 2020.

You can use the **Draft** role for all the exercises in this tutorial. Exercises 1 to 6 require the **Design** task with the **2D Objects**, **2D Areas**, **Quick Access** and **Filter** and **Change** task areas.

The last exercise requires the **Modeling** task with the **3D Objects**, **Boolean Operators** and **Work Environment** task areas.

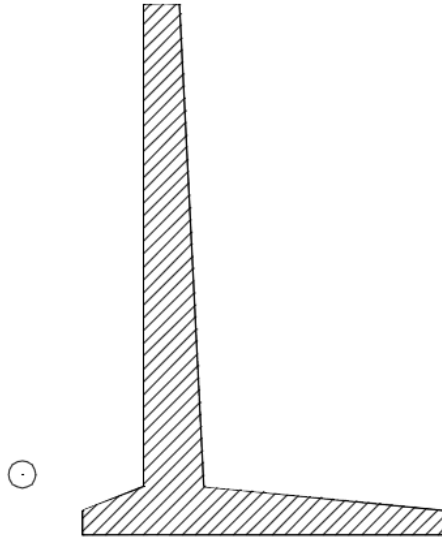
Exercise 1: File Cabinet with Drawers

- Precision drafting using the  **Point snap options**
- Using the tools of **direct object modification**
- Basic edit tools
- Modifying the offset between parallel lines
- Stretching entities
- Copying and mirroring elements



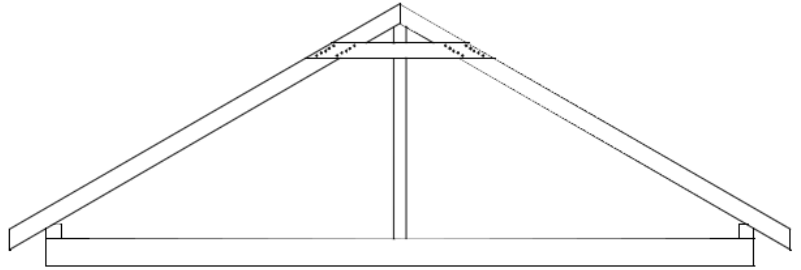
Exercise 2: Retaining Wall with Drainage

- Delta point
- Hatching and hatching definition
- Polyline entry tools



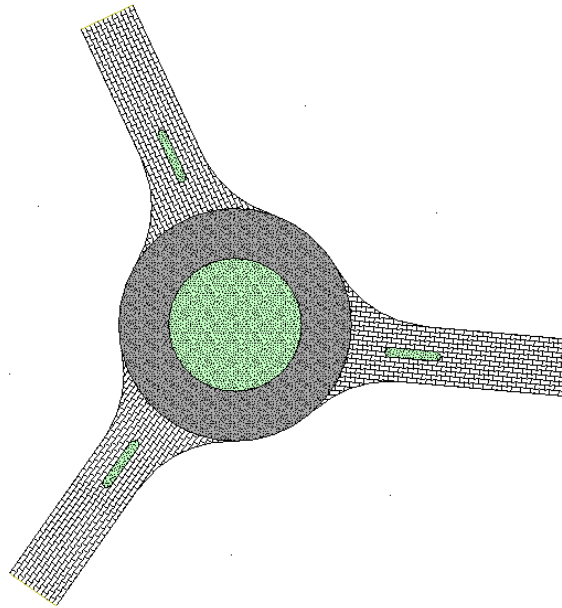
Exercise 3: Purlin Roof

- More tools for editing elements
- Creating labels with leaders



Exercise 4: Rotary

- Creating a circle
- Area detection and island detection
- Patterns and pattern definition
- **Direct object modification** - Copy and Rotate



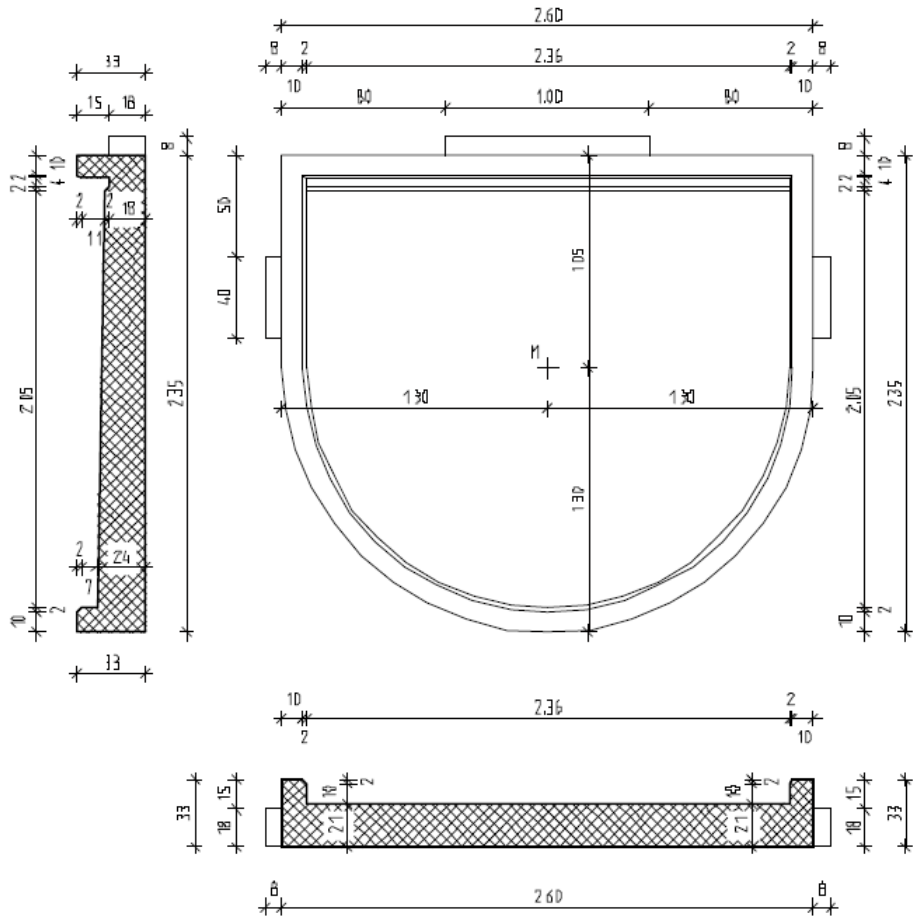
Exercise 5: Title Block

- More tools for editing elements
- Creating and saving symbols
- Retrieving symbols from the library

Index	Type of Change	Date / Name
Contents		
Precast Balcony Unit, Type 12		
Project		
New Condominium With Underground Parking		
Client		Date
Client Street, Munich		XX XX.20XX
		Drawn by: Name
Architect		Checked by: Name
Architects Street, Munich		Scale: 1:50/25
Engineer		Layout number
Consulting Engineers Street, Munich		XXX

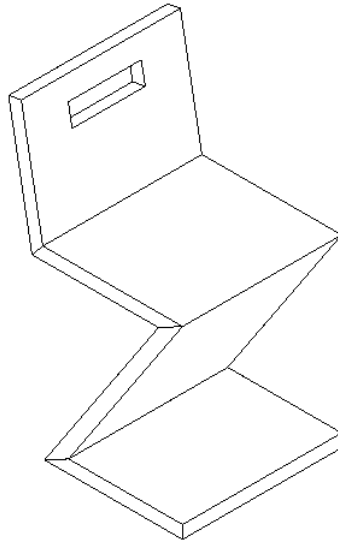
Exercise 6: Precast Balcony Unit

- Creating and modifying dimension lines
- Hatching and hatching definition
- Print Preview



Exercise 7: Rietveld Chair

- Introduction to Modeling
- Using a work plane
- A note on setting surfaces



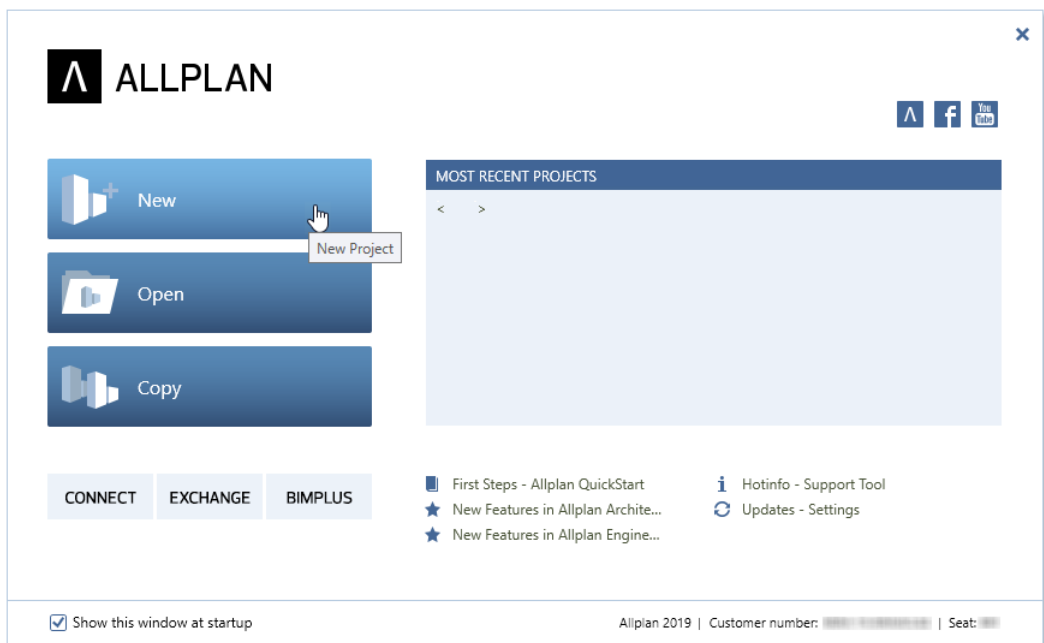
Creating the project


You use drawing files and NDW files in Allplan 2020. Drawing files are organized by **project**.

You will start by creating a project for the exercises in this tutorial.

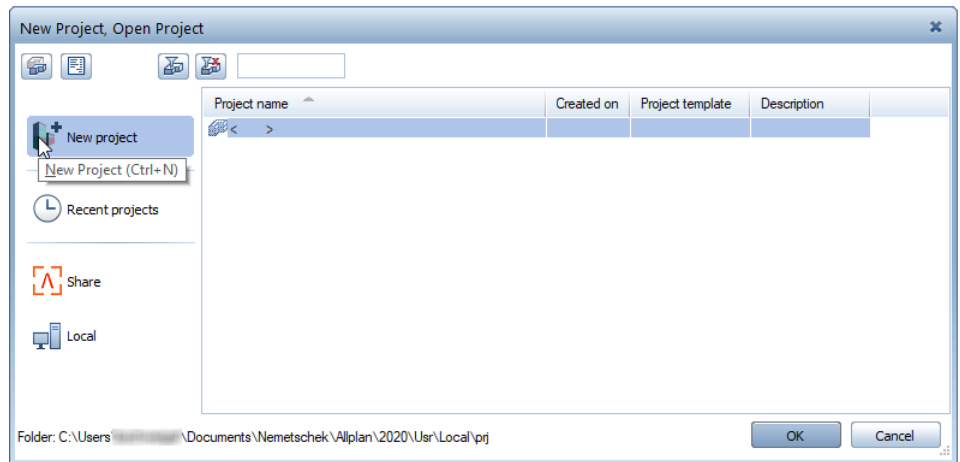
To create a project

- 1 After having started Allplan 2020, you can create a new project straight from the welcome screen. Click the corresponding tool and continue with step 4.



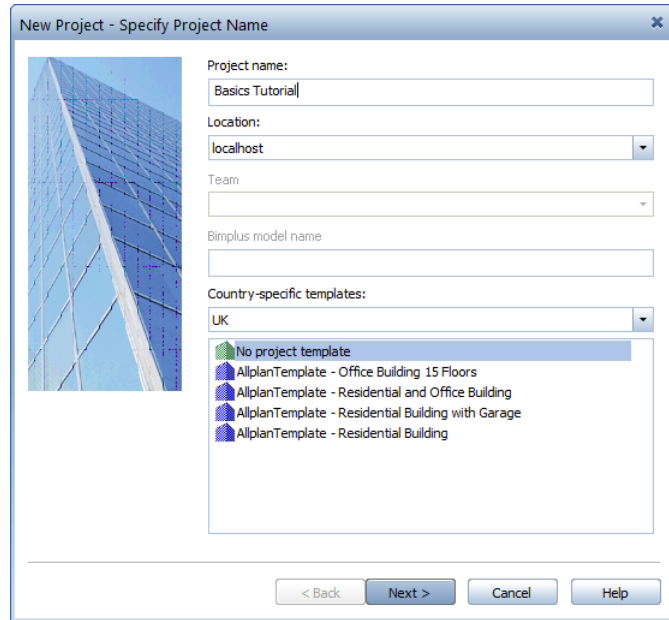
- 2 If you have switched off the welcome screen, click  **New Project, Open Project...** on the Quick Access Toolbar.

- 3 The **New Project, Open Project** dialog box opens. Click  **New Project**.



- 4 *New Project – Specify Project Name*
Enter the project name: **Basics Tutorial**.
- 5 Use **Location** to select the place where you want to save the new project. If you have the **Workgroup Manager** option, you can see all computers that were added as servers to the workgroup. If you have the **Allplan Share** option, you can also select BIMPLUS.
- 6 When you choose to save the project on BIMPLUS: Select the team and enter the Bimplus model name.
- 7 Using **Country-specific templates**, you can select the country for the project templates displayed.
The new project does **not require a project template**. Therefore, you can ignore this setting.

8 Click **Next >**.

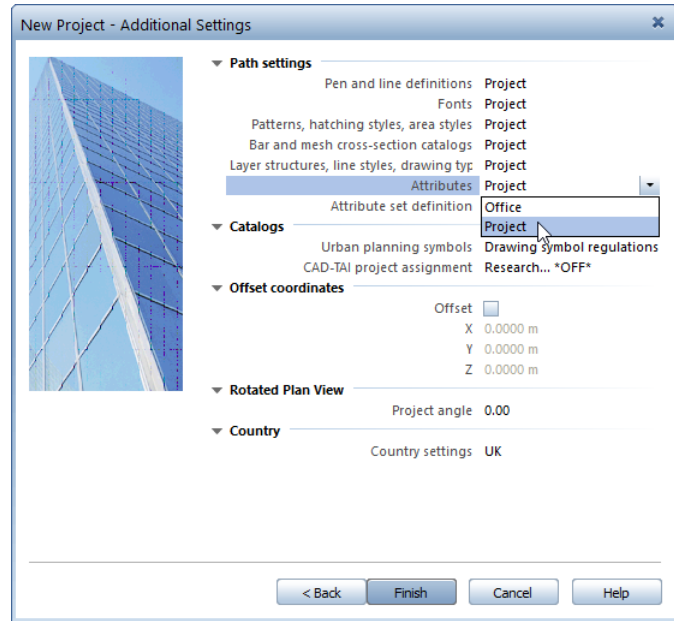


9 You will define new patterns and hatching styles as you go along. You will use project-specific settings so that you do not change the office standard inadvertently.

Note:

Organizing projects is described in detail in the help for Allplan and in the Architecture Tutorial.

Set all **Path settings** to **Project** and click **Finish** to confirm the dialog box.



Allplan creates the **Basics Tutorial** project and opens it automatically.

Path settings:

These define whether the pens, line types, hatching styles, fonts and material catalogs available in that project are based on the office standard or whether they are project-specific. In practice, the office standard is generally used.

Office:

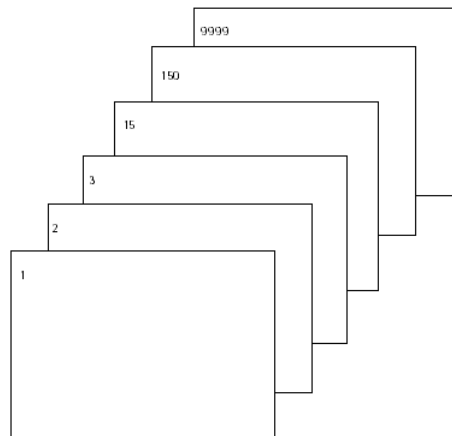
Choose this option if you want different projects within the same office to use the same settings (for hatching, line types etc.). If you work on a network, the office standard is the same on all computers and can only be changed by users with special privileges.

Project:

Choose this option if you want the settings, for instance for patterns and hatching styles, to apply to this project only (in which case they will probably be different to those used as the office standard).

Understanding drawing files

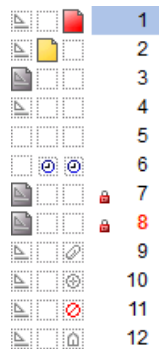
In Allplan, the actual design and data creation process happens in *drawing files*. These are the equivalent of the transparencies used in conventional building design. Drawing files can be used to give projects a structure. In IT terms, a drawing file is a conventional file stored on your hard disk. You can display and edit up to 128 drawing files at once – in other words, you can have several files open simultaneously. A project can contain up to 9999 drawing files. When working without layers, the individual building elements (such as walls, stairs, labeling, etc.) are drawn on different drawing files and superimposed like transparencies.





In order to edit the drawing files, they have to be activated (opened). You can do this using the **Open on a project-specific basis: drawing files from fileset/building structure** dialog box.

Drawing file status

With the drawing file status, you define the drawing file on which you draw and which drawing files are visible and can be modified. The following illustration shows the different drawing file statuses. You can find an explanation in the table below.



Number	Drawing file status	Comment
1	Current or active	The current or active drawing file is the one in which you draw. There must always be one current or active drawing file.
2	Open in edit mode	Elements in drawing files open in edit mode are visible and can be modified. Up to 128 drawing files can be open simultaneously (regardless of whether they are current, in edit mode or in reference mode).
3	Open in reference mode	Elements in drawing files open in reference mode are visible, but they cannot be modified. You can configure the program to use the same color for all elements in reference drawing files. To do this, select the  Options , click Desktop environment and open the Display page. You cannot open empty drawing files in reference mode.
4	Not selected	Elements in these drawing files are not visible.
5	Empty	Empty drawing files have no data type icon.
6	Assigned temporarily	The drawing file is assigned temporarily to the fileset. Allplan clears this assignment as soon as you switch to a different fileset.
7	Open in reference mode	The drawing file has been opened by another user in the workgroup environment.

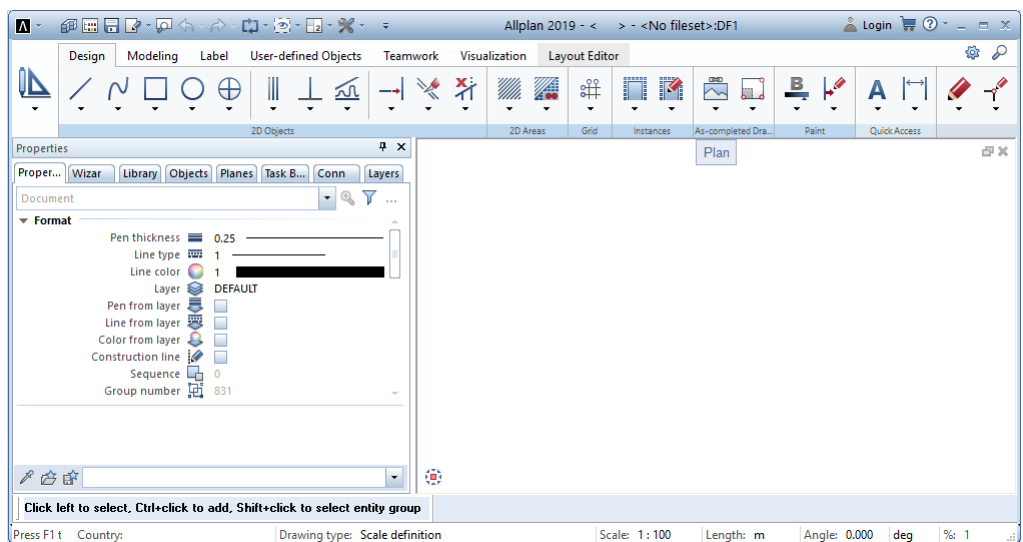
8	Open in reference mode	<p>The drawing file has been opened by another user in the workgroup environment; the color red indicates that the drawing file has changed. You can apply the changes by selecting Update drawing file on the shortcut menu.</p> <p>Using the  Options - Desktop environment page, you can configure the program to inform you of changes in reference drawing files.</p>
9	Linked drawing file	<p>The drawing file includes model data or views and sections linked with other drawing files. Allplan links drawing files when you create views and sections using the tools in the Reinforcement Views task area.</p> <p>Using the shortcut menu, you can list all reference drawing files of the current drawing file or set its reference drawing files to edit or reference mode.</p>
10	Views and sections created automatically	<p>The drawing file includes views and sections created using the shortcut menu in the 'Derived from building structure' area or views and sections created with the tools in the Sections task area of which the results were saved in this drawing file.</p> <p>These views and sections usually refer to other drawing files. Allplan considers the model data in these drawing files.</p>
11	Update locked	<p>Using the shortcut menu in the 'Derived from building structure' area, you can lock the update of drawing files with views and sections created with the Update automatically option not being selected. Allplan cannot update the result until the drawing file is unlocked or the Update automatically option is selected. After having confirmed a prompt, you can create a new view or section in the drawing file.</p>
12	Views and sections placed manually	<p>The drawing file includes views and sections created with the tools in the Sections task area.</p> <p>These views and sections can refer to other drawing files. Allplan considers the model data in these drawing files.</p>

Basic Settings

Next, make settings that you will use in the exercises.

Actionbar configuration

The Actionbar configuration is set by default in Allplan 2020. This configuration shows the **Actionbar** above the workspace. In addition, you can see the **Properties**, **Wizards**, **Library**, **Objects**, **Planes**, **Task Board**, **Connect** and **Layers** palettes on the left.



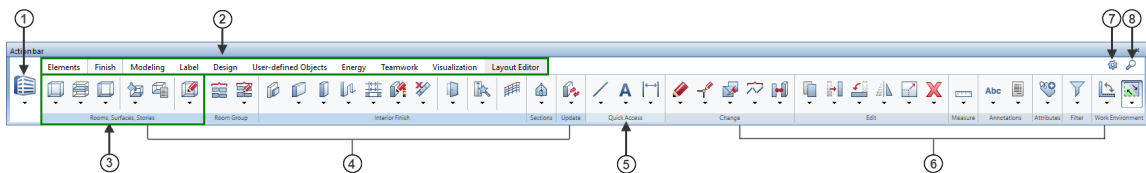
Click the **Allplan Icon** on the left to open important tools such as save, copy, import and export. The title bar also includes the **Quick Access Toolbar**. Using a dropdown list, you can select the tools you want to display on this toolbar. In addition, you can also show and hide the menu bar, define the sequence of the tools on the Quick Access Toolbar and click **Customize User Interface...** to open the **Customize** dialog box – **Actionbar** tab.



Contents and structure of the Actionbar

The **Actionbar** includes all Allplan tools grouped by role and task.

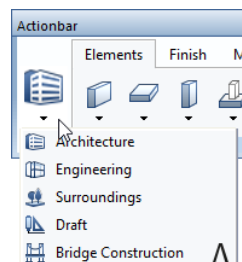
The **Actionbar** is docked to the top of the working area. If you want, you can drag the Actionbar to the bottom of the workspace and dock it there. You can also make the **Actionbar** float anywhere on your screen. By double-clicking the left mouse button, you can dock it to the place where it was docked last.

structure of Actionbar




- 1 – Role
- 2 – Tasks arranged on tabs
- 3 – Task area
- 4 – Varying task areas
- 5 – **Quick Access** task area
- 6 – Fixed task areas
- 7 –  **Actionbar Configurator**
- 8 –  **Find**

Selecting the role



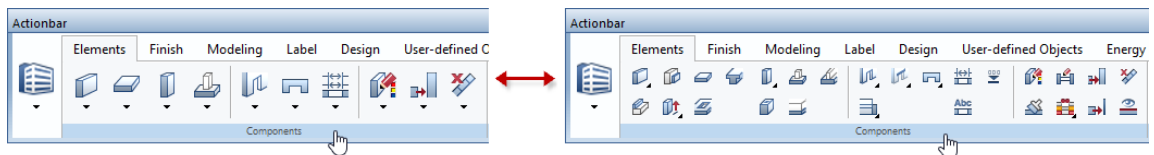
You start by selecting a **role** (1). The roles that are actually available to you depend on the selected **configuration** (7). If **Actionbar [Default]** is selected, you can choose from all the roles you purchased (depends on the license).

The **tasks** (2) that are available to you change with the selected role. To open a task, click the corresponding tab. Each task is subdivided into appropriate areas. You can find areas in different colors, indicating varying and fixed **task areas** (3). The varying task areas (4) change with the selected task, such as the **Components** task area of the **Elements** task. The fixed task areas (6) are always included in all roles and tasks, such as the **Change** and **Filter** task areas. The **Quick Access** task area (5) includes tasks with frequently used tools.

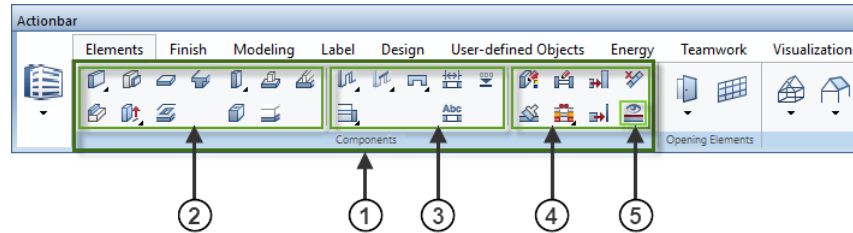
The first time you open Allplan the task areas of the **Actionbar** are collapsed. To open the flyout menu of the tools displayed, click the downward arrow. You can then see all the tools in the collapsed area. When you point to the name line of a task area, the cursor changes to .

You can maximize or minimize a task area by double-clicking the left mouse button within the name line of a task area. A maximized task area shows more tools, which may also have flyout menus.

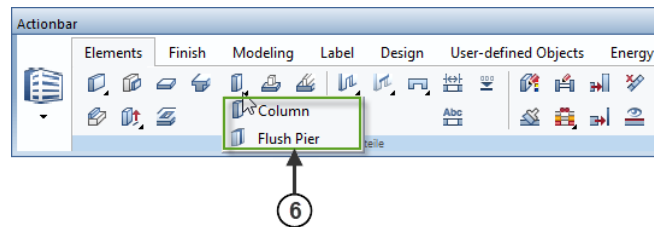
Note: You can maximize or minimize **all** task areas of the task currently selected by pressing CTRL while double-clicking the left mouse button within the name line of a task area. You can expand or collapse **all** areas **across tasks and roles** by pressing CTRL+SHIFT while double-clicking the left mouse button within the name line of a task area. The width of the Allplan window defines how many task areas can be maximized. If the window is not wide enough, Allplan starts on the left, expanding as many task areas as possible.



Structure of a task area in detail



- 1 – Task area
- 2 – **Create** group of tools
- 3 – **Create in context** group of tools
- 4 – **Modify in context** group of tools
- 5 – Tool



- 6 – Tool menu = flyout menu of a tool

An expanded task area (1) contains one or more groups of tools (2/3/4). Different groups of tools are separated by vertical lines. The tools are grouped by topic. Some tools have flyout menus (6) where you can find similar tools.

Palette window

The palette window displays the palettes as tabs. Palettes are important controls of Allplan, making the user interface simple and easy to use. You can float or dock each palette individually. In addition, you can arrange the palette window or individual, free-floating palettes around the edge of the workspace or make them float anywhere on your screen. You can even configure Allplan to automatically show or hide the palette window or palettes arranged around the edge.

'Properties' palette


When the **Properties** tab is open, you have the following options:

Dropdown list at the top


Tools at the top and bottom


Properties


Select active elements


 Zoom in on selected objects


Modify properties

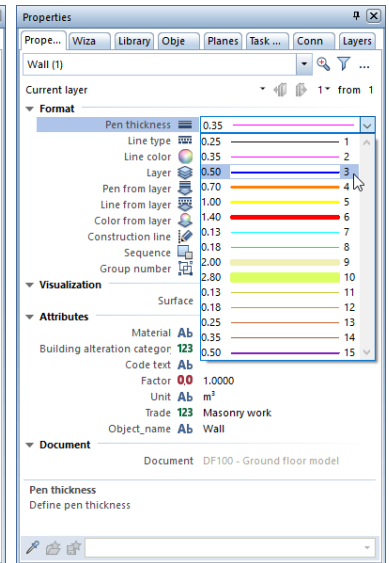
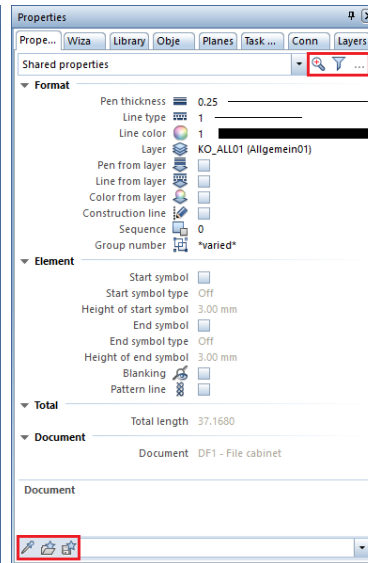
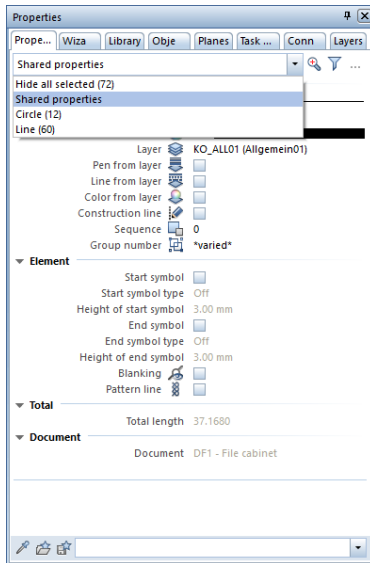
 Filter Step by Step

 Change the properties of the selected object

 Match parameters

 Load favorite

 Save as a favorite



'Wizards' palette

When the **Wizards** tab is open, you have the following options:

Dropdown list at the top

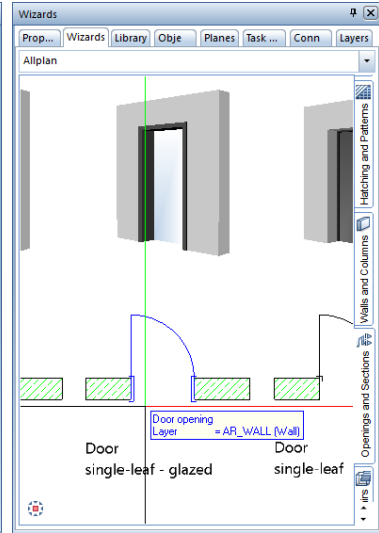
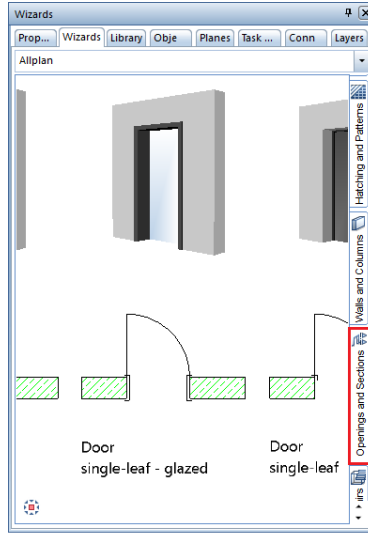
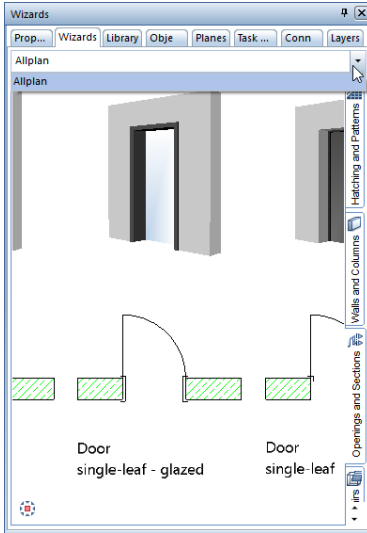
Tabs on the right

Available tools


Select a wizard group

Select a wizard

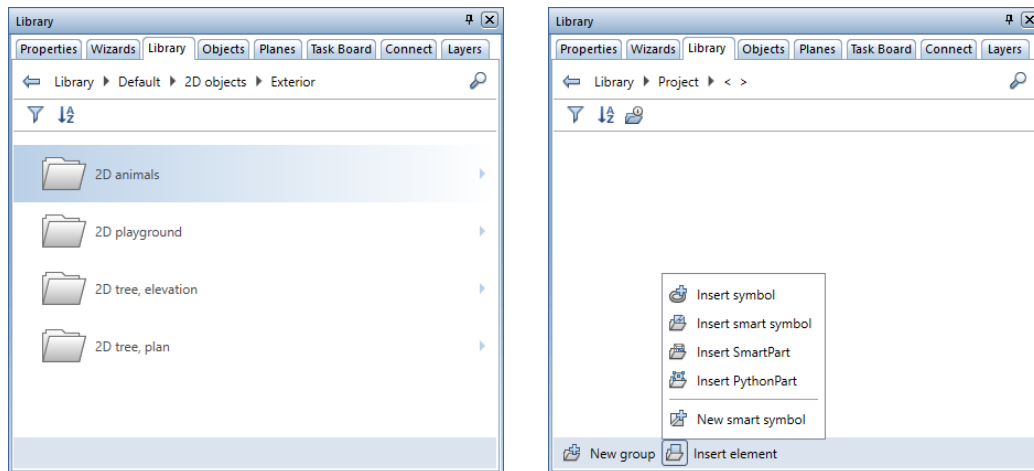
Select a tool









'Library' palette

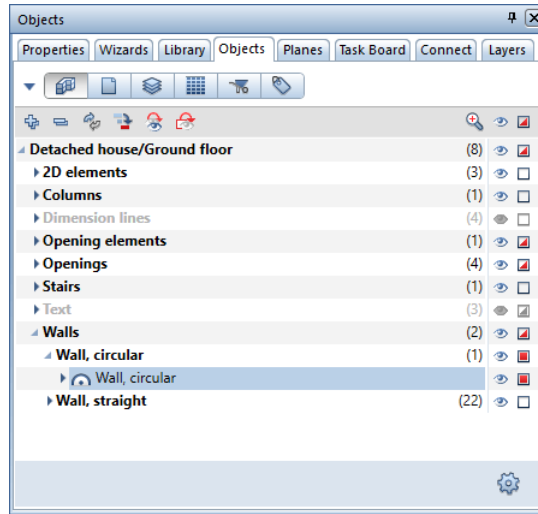
The **Library** palette includes a  **Filter** you can use to show or hide specific types of library elements (symbols, smart symbols, SmartParts and PythonParts).

After having opened a folder, you can see all subfolders with library elements (symbols, smart symbols, SmartParts and PythonParts), provided you have not filtered out library elements. You can select the objects you want to use. You can also add your own objects to the corresponding library folders.



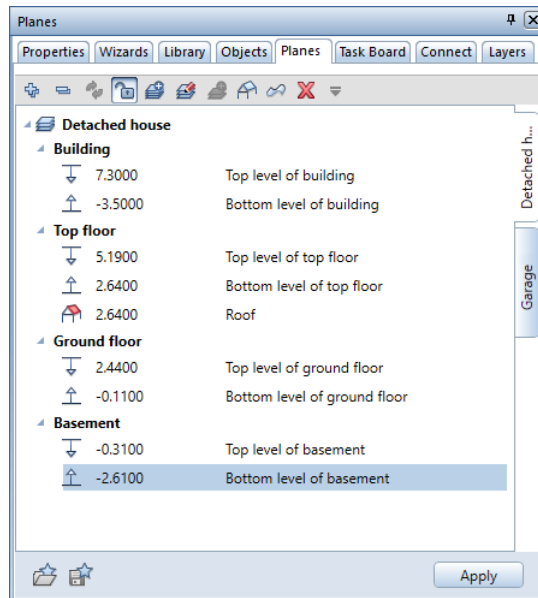
'Objects' palette



The **Objects** palette lists all objects and elements in the currently open drawing files (**current** or **open in edit mode** or **open in reference mode**). You can sort these objects by  **Topology**,  **Drawing file**,  **Layer**,  **Material**,  **Trade** or  **Attribute**. You can show or hide the individual objects as you need. You can even activate or deactivate objects and elements using the **Objects** palette.








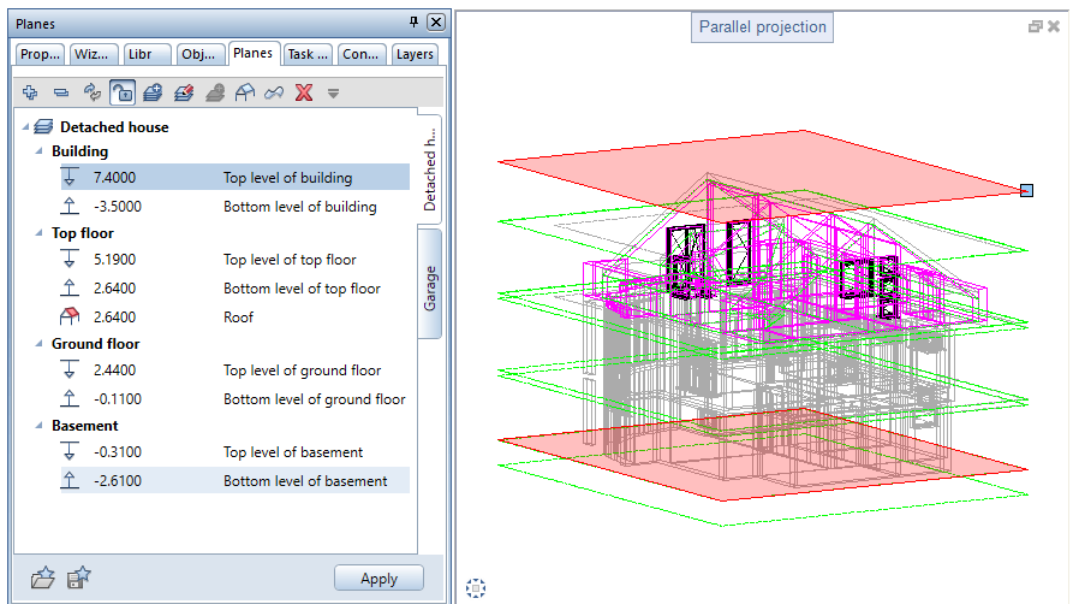
'Planes' palette

The **Planes** palette displays all plane models in the active project. Each plane model has its own tab. While creating components, you can keep track of the default planes and all other objects on which the heights of the components can be based.



To edit a plane model, click  **Modification mode on/off**. If modification mode is on () , you can make entries in the **Planes** palette. Allplan displays the planes of the plane models in all viewports. When you point to or select an entry of the plane model in the tree structure, this entry is also highlighted in the detection color in the viewport. So, you can immediately check the position of the plane and see the effects of changes.

The tools in the **Planes** palette are similar to those provided by the  **Floor Manager** dialog box of the building structure. For example, you can use the ,  **Insert or replace roof-scape** and  **Insert or replace reference surface** tools. Using , you can even create a new plane model.



'Task Board' palette

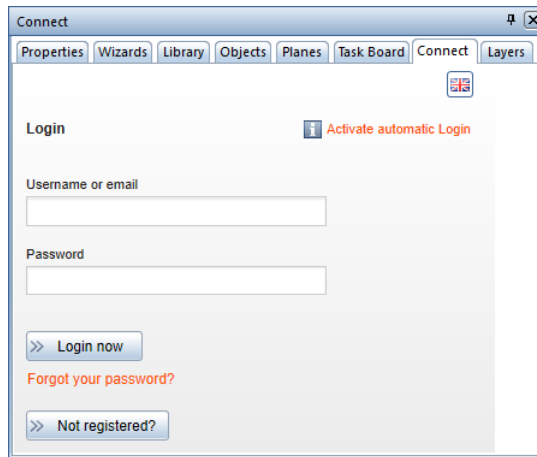
You can use the **Task Board** palette to communicate with all those involved in a Bimplus project. Allplan allows you to access the tasks of the currently loaded Allplan project straight from Bimplus. In addition, you can use Allplan to create new tasks for Bimplus or edit existing tasks. You can also import or export tasks in BCF format or export the complete task list as an Excel table.

Note: This is only possible if you have used the Allplan workstation to log in to Bimplus and if the Allplan project is linked with a Bimplus project, that is to say, the Allplan project data have been uploaded to Bimplus *at least once*. See Handling projects using Allplan Bimplus in the Allplan Help for more information on handling projects in a BIM-compliant manner using Bimplus, the web service offered by ALLPLAN GmbH.



'Connect' palette

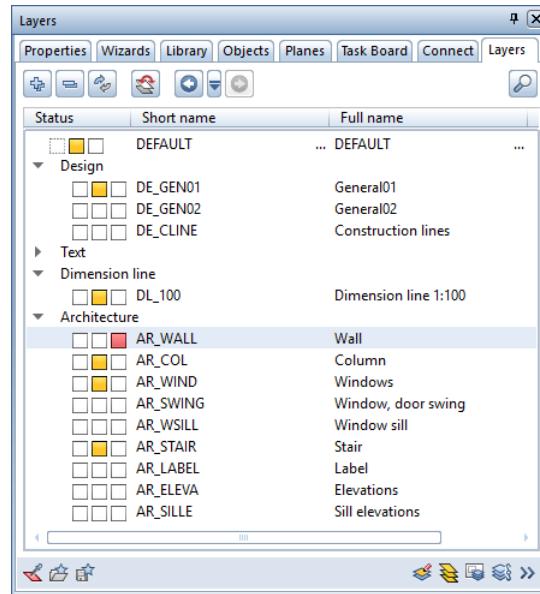
The **Connect** palette takes you straight from Allplan to content provided by Allplan Connect. You can enter your user name and password either directly in the palette or on the **Palettes** tab of the **Customize User Interface...** tool you can find in the dropdown list of the **Quick Access Toolbar**.



The image shows a screenshot of the 'Connect' palette in Allplan software. The palette has a title bar with the text 'Connect' and a close button. Below the title bar is a tabbed interface with the following tabs: Properties, Wizards, Library, Objects, Planes, Task Board, Connect, and Layers. The 'Connect' tab is active. Inside the 'Connect' tab, there is a 'Login' section. At the top right of the login section is a small icon and the text 'Activate automatic Login'. Below this are two input fields: 'Username or email' and 'Password'. At the bottom of the login section are three buttons: '>> Login now', 'Forgot your password?', and '>> Not registered?'. The 'Forgot your password?' button is in red text.

Layers palette

Using the **Layers** palette, you can access the layer structure quickly and easily. The palette displays the entire layer hierarchy. You can define the visibility of layers, change the layer status, select the current layer and choose privilege sets and print sets.



Note:

You can find the **Customize User Interface...** tool in the dropdown list of the quick access toolbar. Using the **Palettes** tab, you can arrange and customize the palettes to suit your needs. You can show and hide the palettes as you need.


As an alternative, open the shortcut menu of a palette and select **Customize...**

Settings on the Actionbar

Tip: You can expand or collapse all task areas of the task currently selected by pressing CTRL while double-clicking the left mouse button within the name line of a task area. The width of the Allplan window defines how many task areas can be expanded. If the window is not wide enough, Allplan starts on the left, expanding as many task areas as possible.


You can use the **Draft** role for all the exercises in this tutorial.

To make settings on the Actionbar for the exercises that follow

- 1 Select the  **Draft** role.
- 2 Open the tab of the **Design** task.
- 3 Expand the **2D Objects** task area by double-clicking the left mouse button in the name line of this task area.



Note: The **Actionbar** is docked to the top of the working area. If you want, you can drag the Actionbar to the bottom and dock it there. You can also make the **Actionbar** float anywhere on your screen. By double-clicking the left mouse button, you can dock it to the place where it was docked last.

Track tracing

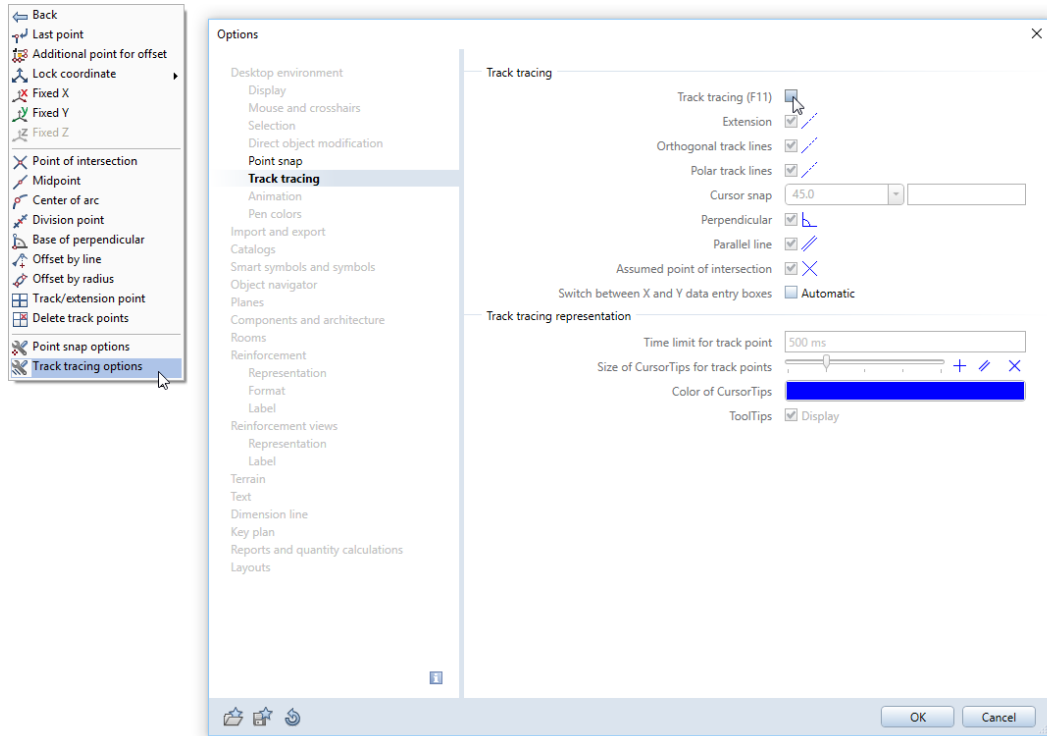
Tip: You can quickly switch track tracing on and off at any time while entering points. Just press the **F11** key or click  **Track line** in the dialog line.


Track tracing helps you design intuitively. As you usually work with fixed measurements in the following exercises, you do not need track tracing.

To switch track tracing on and off

- 1 Click  **Line** (**Draft** role - **Design** task - **2D Objects** task area or **Architecture** role - **Elements** task - **Quick Access** task area).
- 2 Right-click in the workspace and select  **Track tracing options** on the shortcut menu.

3 Switch Track tracing off.




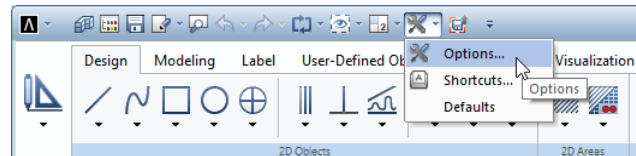
- 4 Click **OK** to confirm the settings and press **ESC** to quit the  **Line** tool.
- 5 Repeat these steps if you want to switch track tracing on again.

Options

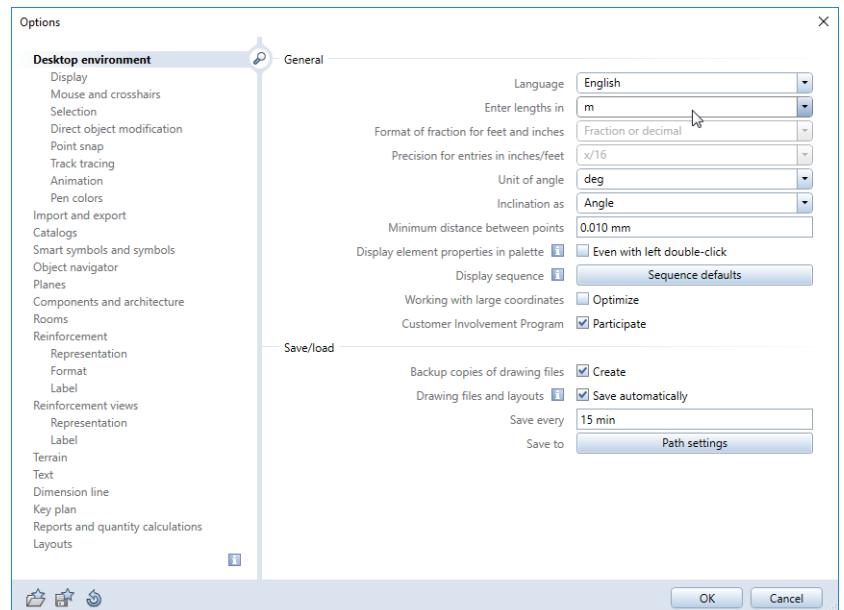
You will use the unit **m** for the following exercises.

To set the options

- 1 Click  **Options** in the  **Default Settings** dropdown list on the Quick Access Toolbar (title bar).



- 2 The **Options** dialog box opens. Click **Desktop environment** in the area on the left.
- 3 Check the **Enter lengths in** option in the **General** area on the right. If it is not set to **m**, click the button and select **m**.



- 4 Click **OK** to confirm the settings.

Pen settings

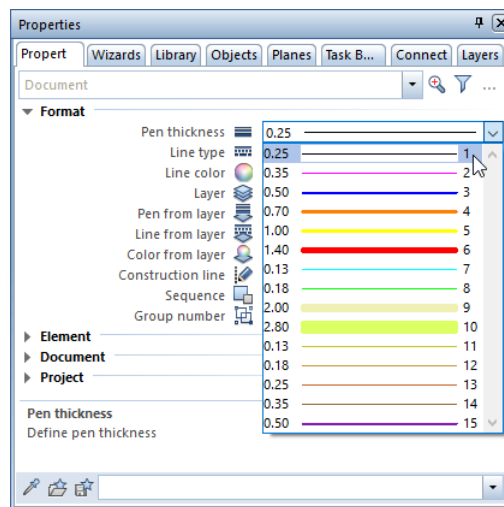
Before you start drawing, you need to define the line thickness (pen) and the line type in the **Properties** palette. You can change these settings at any time.

Each element can be given one of Allplan's 256 line colors or element colors. However, the way elements look depends on the setting of the **Color stands for pen** option in  **Show/Hide** ( **View** dropdown list on the Quick Access Toolbar):

- When the **Color stands for pen** option is selected, the element is automatically displayed in the color that is associated with the current pen thickness (this is the default setting).
- When the **Color stands for pen** option is not selected, the element is displayed on the screen using the line color you selected.

To set the pen and line type

- 1 Switch to the **Properties** palette, go to the **Format** area, click the **Pen thickness** dropdown list and choose **0.25 mm**. The selected pen is displayed.



- 2 Click the **Line type** dropdown list and choose **1** (a continuous line).
 - 3 Click the **Line color** dropdown list and choose **1** (black).
-

Draw all the exercises in this guide with these basic settings even if this is not explicitly specified.

Allplan provides two different options for structuring drawing files:



- The building structure
- The fileset structure

You can use these two structures in parallel manner. The building structure is particularly useful for applying a logical structure to a building.

As the exercises in this tutorial do not build on one another, a separate drawing file is used for each exercise.

Controlling what's on your screen

Allplan offers various tools you can use to control how your model and its design elements appear on the screen. Thus, you can always choose the tool best suited to the task at hand.












You can access these tools from various places in Allplan. For example, you can use the  **View** and  **Window** drop-down lists on the **Quick Access Toolbar**. You can also use the shortcut menu or the viewport toolbar. You can even use the keyboard and mouse to control what's on your screen.






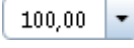
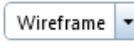



Tools for displaying the model

Using the tools on the viewport toolbar, you can not only move freely on the screen but also set any view. You can zoom in on any section or detail of your drawing as closely as you want. You can even use different view types to display the entire model or selected components.

Most of these tools are 'transparent' tools; in other words, you can use them while another tool (for example, **Line**) is active.

You cannot see the viewport toolbar until you point to the lower border of the viewport, guaranteeing as large a workspace as possible. When you use multiple viewports, each viewport has its own viewport toolbar.




Tool	Use
	<p>Area on the left:</p> <p>You can use this tool to choose between plan view and any of the predefined standard views.</p>
	<p>You can use this tool to set the display scale so that you can see all the elements in the visible files.</p>
	<p>Note: If you have loaded a view using  Save, Load View, you can only see this view.</p> <p>You can use this tool to zoom in on a section. To do this, press and hold down the left mouse button and enclose the elements you want to zoom in a selection rectangle.</p>
	<p>You can use this tool to enable or disable navigation mode in the current viewport. In this mode, you can use the mouse to view a 3D model.</p>
	<p>Note: You can navigate in sphere mode or in camera mode (keep the CTRL KEY pressed down).</p> <p>You can use this tool to restore the previous view or display scale set (provided you had selected a different view or scale before you selected the current setting).</p>
	<p>You can use this tool to restore the next view or display scale set (provided you have already selected a subsequent view or scale).</p>
	<p>You can use this tool to save the current view under a name of your choice or retrieve a view you saved beforehand.</p>
	<p>You can use this tool to display 3D models in three-dimensional space in a perspective view by entering an eye point (observer) and a target point. You can also use this tool to create a view based on the building structure.</p>
	<p>You can use this tool to select the design entities you want to display in the current viewport. The program temporarily hides all the other design entities.</p>
	<p>You can use this tool to temporarily hide drawing files that are currently visible in the active viewport.</p>

Tool	Use
 Always on Top or 	<p>You can use this tool to place the viewport so that it is always on top (i.e., in front of) the other ones.</p> <p>You can only use this tool if you have <i>not selected</i> the Connected option and the viewport is <i>not maximized</i>.</p>
 Exposure (only for the Animation and RTRender view types)	<p>Area on the right:</p> <p>You can use this box to control the brightness in viewports of the Animation or RTRender view type. You can enter a value between -25 and 25.</p> <p>Important! This setting <i>only</i> changes the way elements look in the current viewport. It has <i>no</i> effect on rendering.</p>
 Section Display	<p>You can use this tool to display your design in an architectural section for which you have already defined the  Clipping Path.</p>
 Display Scale	<p>You can use this tool to set the scale for displaying the model on screen. The display scale governs the ratio between the model as displayed on the screen and its real-life dimensions. The scale therefore changes automatically if you change the size of sections displayed on screen. The current display scale is shown on the viewport toolbar in the lower border of a viewport.</p>
 View Type	<p>You can use this list box to select one of the predefined view types (Wireframe, Hidden, Animation, Sketch or RTRender) for the current viewport. Of course, you can also select a view type you defined yourself. Click  to modify various settings of the view types. The settings apply to all the viewports using this view type. Click New view type... to define and save your own view types.</p> <p>When Layout Editor is open, you can switch between Design view and Print view (= preview of resulting printout).</p> <p>Note: You can find more tools for controlling what's on your screen in the  View and  Window drop-down lists on the Quick Access Toolbar and on the shortcut menu (in navigation mode only).</p>







How to ...

Sometimes, things will not immediately work out as required. This list helps you succeed.

What if ...

- **... I have selected the wrong tool?**
Press ESC and click the correct icon.
- **... I make a mistake as I go along?**
Press ESC to quit (you may have to do this several times).
Click  Undo.
- **... I have inadvertently deleted the wrong elements?**
If  Delete is still active, press the right mouse button twice.
If no tool is active, click  Undo.
- **... I have unintentionally opened a dialog box or entered wrong values?**
Click Cancel.

And what if ...

- **... the workspace is empty but you are sure the drawing file contains design data?**
 - Click  Zoom All (viewport toolbar).
 - Click  Plan.
- **... the workspace is suddenly divided into a series of different viewports?**
Click  1 Viewport ( Window dropdown list on the quick access toolbar).
- **... specific kinds of elements such as text or hatching do not appear in the workspace?**
Click  Show/Hide ( View dropdown list on the quick access toolbar) and check that the relevant element type is selected.

Tip: Check whether the relevant layer is set to visible.

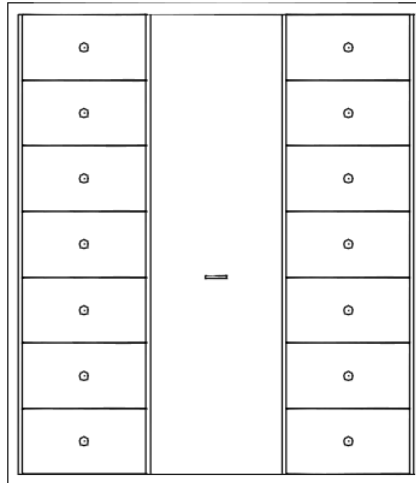
Unit 2: Designing and Modifying 2D Elements

This unit presents Allplan 2020's basic 2D tools. In particular, you will learn

- How to place points precisely
- How to work with track tracing and direct object modification
- How to modify existing elements
- How to apply hatching and patterns – you will familiarize yourself with the polyline entry tools, which are used by countless Allplan tools.
- How to modify and redefine hatching styles and patterns
- How to create labels with leaders
- How to create a title block and save it as a symbol
- How to dimension components

Exercise 1: File Cabinet with Drawers

In this exercise, you will design a file cabinet with drawers. You will then modify the height of the file cabinet.











You will use the tools in the **2D Objects** task area.

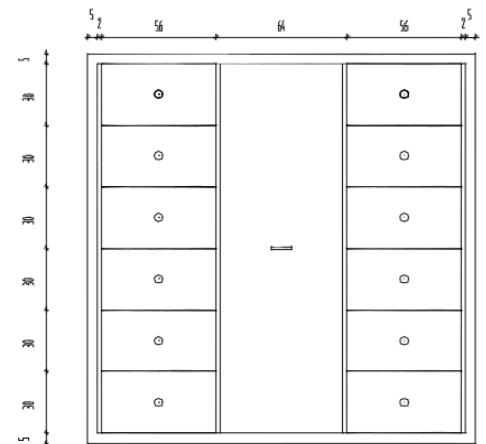
Task 1: designing the file cabinet

The first exercise shows how to draw rectangles and how to copy and mirror elements. In addition, you will learn how to use the **Reference point**, **Point of intersection** and **Midpoint** tools for precision drafting.

Tools:

-  Point snap options
- Point snap and offset entry
-  Offset Polyline
-  Circle
-  Midpoint
-  Copy
-  Options - Desktop environment - Direct object modification
-  Copy and Mirror
-  Delta point

Objective:

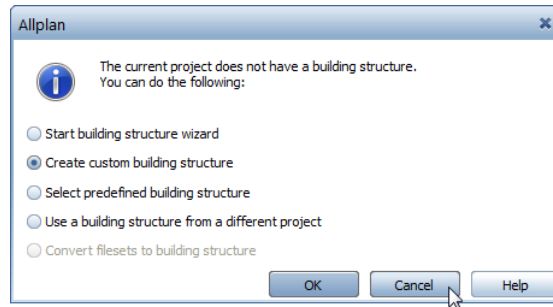


Drawing the file cabinet as a rectangle

To draw the file cabinet as a rectangle

- 1 Click  **Open on a Project-Specific Basis** (quick access toolbar).

- You do not need to create a building structure for this tutorial. As the exercises in this tutorial do not build on one another, you will use a separate drawing file for each exercise. Therefore, click **Cancel**.

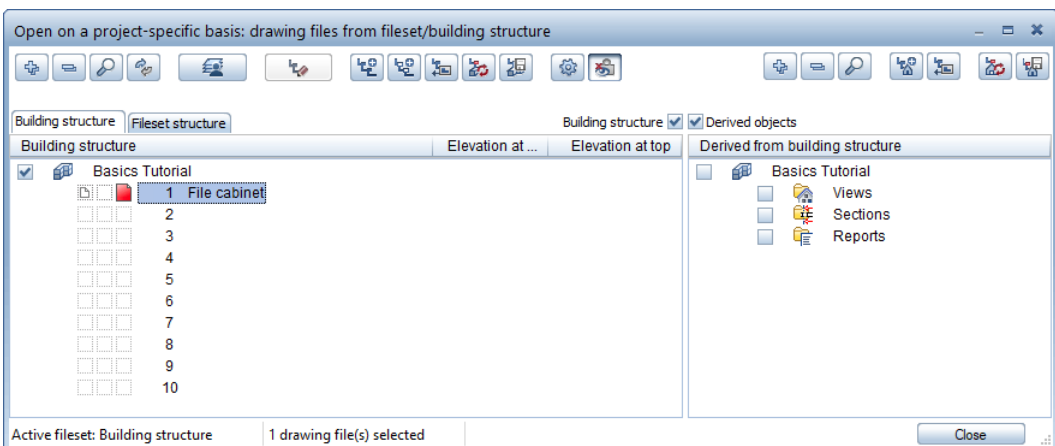


The **Open on a project-specific basis: drawing files from fileset/building structure** dialog box opens, displaying the **Building structure** tab.

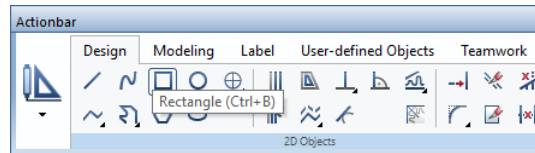
- The **Basics Tutorial** has 10 drawing files. Click drawing file number **1** and click a second time inside the selection or press F2.

You can now enter a name for the drawing file.


- Type in **File cabinet** and press ENTER to confirm.









- 5 Click **Close**.
- 6 Click  **Rectangle** (2D Objects task area).

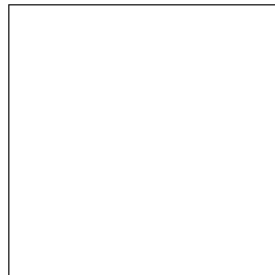



- 7 Select  **Based on diagonal line** in the input options.

Note:  Make sure that **Create rectangle as a polyline** is not active in the input options, as you will edit individual lines of the rectangle later.

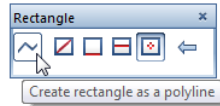
- 8 Click in the workspace to place the first point of the rectangle.
- 9 The length of the rectangle in the x-direction is 1.8 m. Enter  $\Delta x = 1.8$ in the dialog line. Press the TAB key. This takes you to  Δy .
- 10 The height of the rectangle in the y-direction is also 1.8 m. Enter  $\Delta y \text{ dy} = 1.8$ in the dialog line and press ENTER to confirm. The file cabinet is displayed as a rectangle in the workspace.

Tip: To switch between ,  and  in the dialog line, use the TAB key or SHIFT+TAB.





- 11 Press ESC to quit the  **Rectangle** tool.

A note on creating a rectangle as a polyline



You can use the  **Create rectangle as a polyline** option in the input options to do the following:

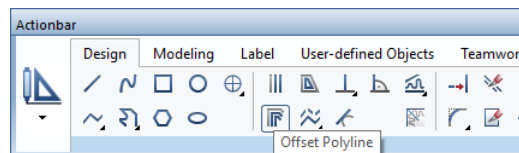
- If  **Create rectangle as a polyline** is active, the rectangle is created as *one* connected element, which you can select with one mouse click.
- If  is not selected, the rectangle consists of individual lines that you can select separately by clicking or as an **entity group** by pressing the SHIFT key while clicking.

Drawing the file cabinet using offset polyline


The next step is to draw the frame of the file cabinet using the **Offset Polyline** tool. You will use **Point Snap** as an aid to precision drafting.

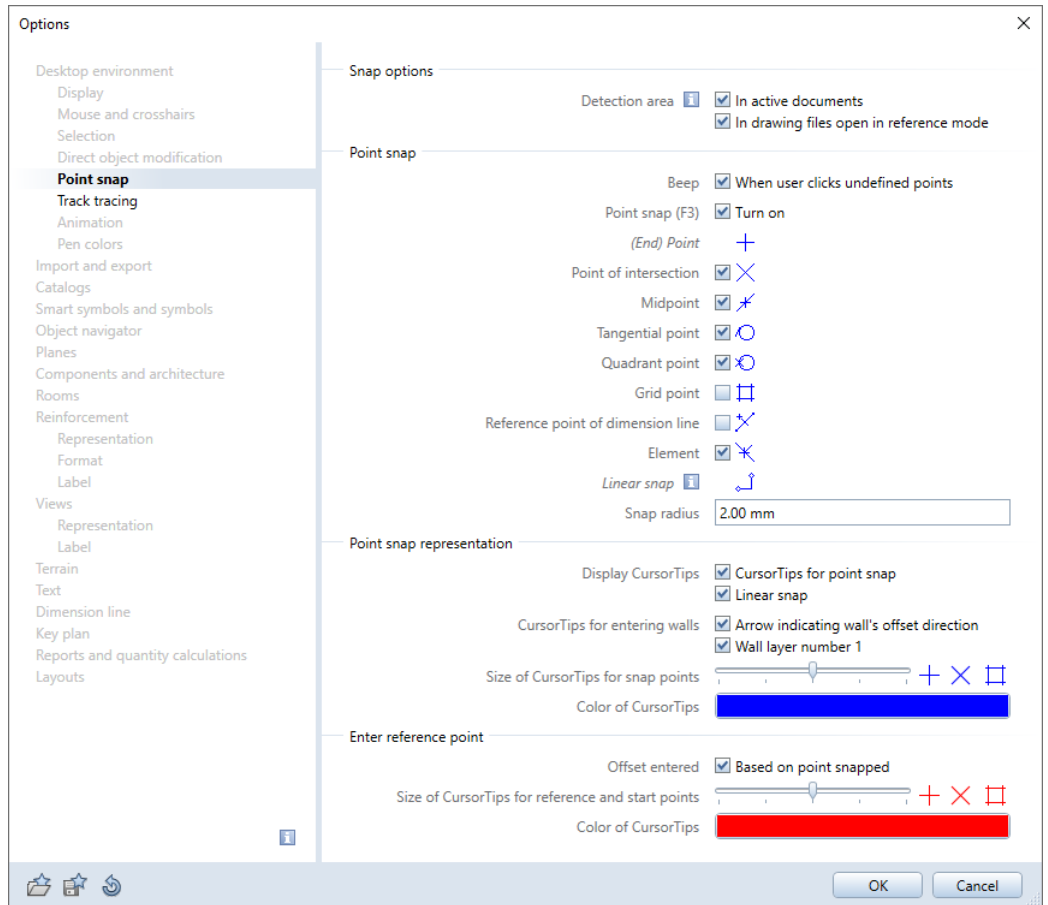
To draw the file cabinet using offset polyline

- 1 Click  **Offset Polyline** (2D Objects task area).



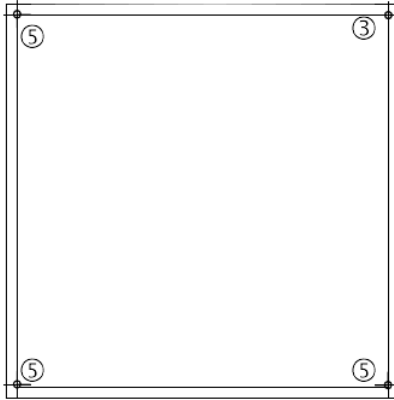
- 2 Enter the following values in the dialog line and press ENTER to confirm after each one.
*Number of parallel lines:*1
*Offset:*0.05
- 3 Click the top right corner of the rectangle.
Right is active in the input options.

- 4 Open the shortcut menu by right-clicking in the workspace. Select  **Point snap options** and select all the options on this page except **Grid point** and **Reference point of dimension line**.




As soon as you point to a point, the system will snap to this point. The point snapped is marked with a red X.

- 5 To draw the new rectangle outside the existing one, click the corners of the file cabinet *in a counter-clockwise direction*. To close the polyline, the last corner you click should coincide with the first one.



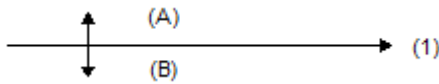
- 6 Press ESC to quit the  Offset Polyline tool.

A note on direction in which the offset polyline is entered

When using  **Offset Polyline**, pay attention to the connection between the setting in the input options and the direction in which you enter the polyline:

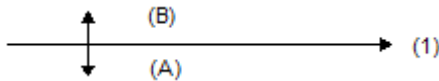
- When set to **right**, you must enter the points *in a counter-clockwise direction* to draw the outer rectangle. Entering the points *in a clockwise direction* produces the inner rectangle.
- When set to **left**, it is the other way round.

When set to **right**:



(1) Direction
(A) Negative offset
(B) Positive offset

When set to **left**:




(1) Direction
(A) Negative offset
(B) Positive offset


Designing drawers



Next, create a drawer using the **Rectangle** tool. Allplan provides a number of tools to help you place points with great precision. In the following section, you will design the drawer by snapping to points and entering offset values.

To design a drawer

- 1 Click  **Rectangle**.

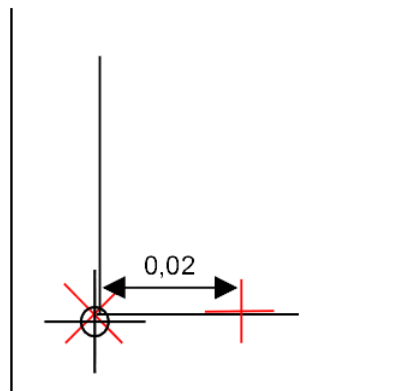
Note: Check that  **Create rectangle as a polyline** is *not selected* in the input options. Otherwise, the rectangle can only be addressed as a single entity. As you need to copy individual lines of the rectangle later, it is essential that the lines can be selected individually.

- 2 Check that  **Delta point** is active in the dialog line.
- 3 To specify the rectangle's start point, point to the bottom left corner of the inner cabinet line.

The system snaps to this point, which is indicated by a blue CursorTip displayed with the crosshairs. A red X is now displayed on this corner, and the  **X-coordinate** and  **Y-coordinate** boxes are highlighted in yellow in the dialog line.

- 4 Press the TAB key to activate the  **X-coordinate** box and enter **0.02**.

A red point symbol (+) moves to the right.




- 5 Click the corner or press ENTER to confirm.
The first point of the drawer is now defined.
- 6 Enter the coordinates of the diagonally opposite point of the rectangle in the dialog line:
 Δx dx = 0.56
 Δy dy = 0.30
Press ENTER to confirm.

dx=0.56

dy=0.30



- 7 This completes the first drawer. You will design the other drawers based on this first one.
- 8 Press ESC to quit the  **Rectangle** tool.





A note on placing points using point snap and offset entry

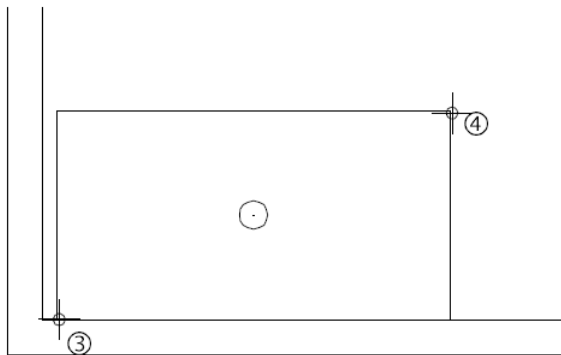
- Point to a point (do not click!):
The system snaps to this point, the data entry boxes are highlighted in yellow in the dialog line.
- Enter the relative dX-coordinate and dY-coordinate in the dialog line.
- Press ENTER to confirm: This places the point.

Creating the knob

Next, create the knob of the drawer using the **Circle** tool. To position the knob exactly, you will use the **Midpoint** option.

To draw a knob

- 1 Click  **Circle**.
- 2 The **Circle** Context toolbar opens. Click  **Circle based on center** and  **Enter full circle**.
- 3 To define the first point, open the shortcut menu and click  **Midpoint**.
- 4 First click the bottom left corner of the drawer.
- 5 Then click the top right corner of the drawer.
The center of the circle is defined.
- 6 Enter a radius of **0.02** in the dialog line and press ENTER to confirm.




- 7 Press ESC to quit the tool.
-

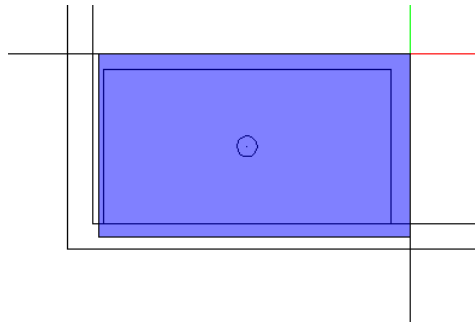
Copying the drawer

You can create the other drawers by **Copying** the first one.


To copy the drawer

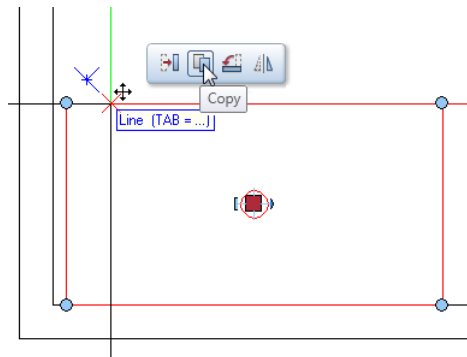
- 1 Enclose the entire drawer in a selection rectangle you open from bottom left to top right (positive x-direction) using the left mouse button.

Tip: Elements can be selected by enclosing them in a selection rectangle. The default setting is  **Select Elements Based on Direction** (Work Environment task area): Opening the selection rectangle in the positive x-direction only selects the elements that are fully bounded by the selection rectangle; opening the selection rectangle in the negative x-direction selects all the elements that are fully or partially bounded by the selection rectangle.

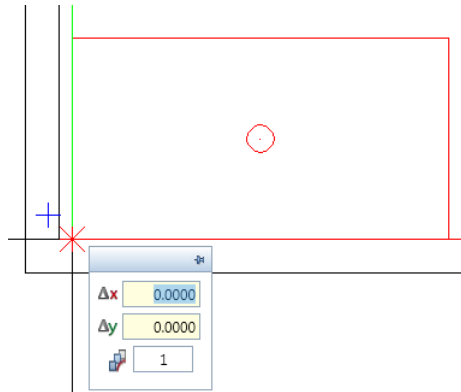


This also selects the knob, as it is within the selection rectangle.


- 2 Point to a line of the drawer and click  **Copy** on the context toolbar.

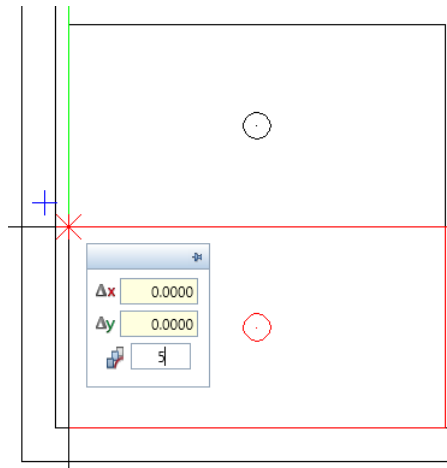


- 3 *From point or enter offset:*
Click the bottom left corner of the drawer.

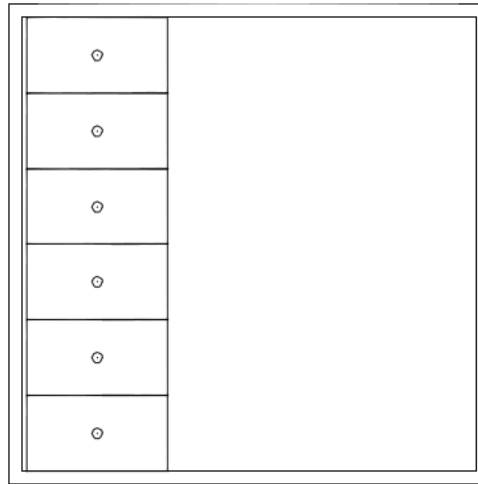


The drawer with the knob is attached to the crosshairs (at the corner you just clicked).

- 4 Go to the coordinate dialog box and set the  **Number** of copies to **5** (do *not* press ENTER to confirm!).
- 5 *To point or enter offset*
To define the drop-in point, point to the top left corner of the drawer so that Allplan snaps to this point.





- 6 Click the drop-in point snapped.
Allplan creates the drawers on the left.
- 7 Press ESC to quit direct object modification.



Note:

The **Work Environment** task area (**Actionbar** – all roles and all tasks) lets you define how and which elements are selected by the selection rectangle:

 Selects the elements that are fully bounded by the selection rectangle.

 Selects the elements that are fully or partially bounded by the selection rectangle.

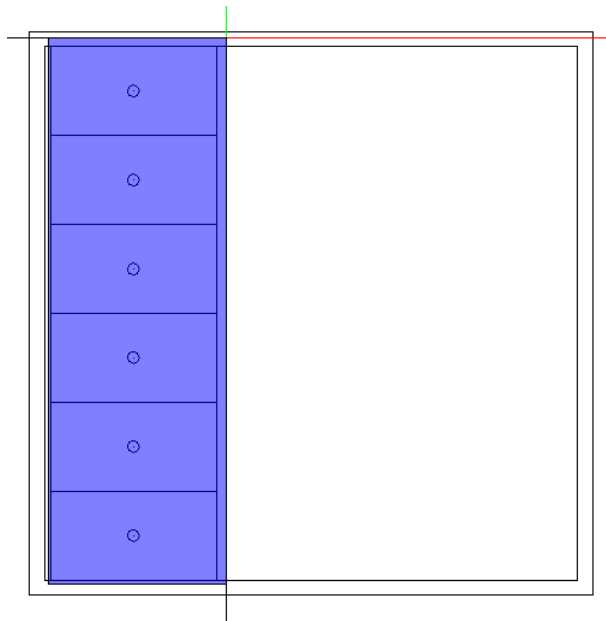
 Selects the elements that are partially bounded by the selection rectangle.

Mirroring drawers

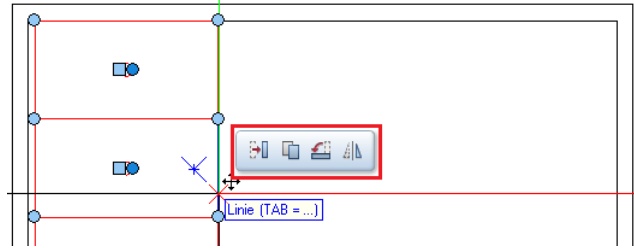
Next, you will mirror the drawers to the right-hand side. To do this, you will use the **Copy and Mirror** tool. The center axis of the file cabinet will serve as the mirror axis.

To mirror the drawers to the right

- 1 To select the drawers, enclose them in a selection rectangle you open from bottom left to top right (positive x-direction) using the left mouse button.





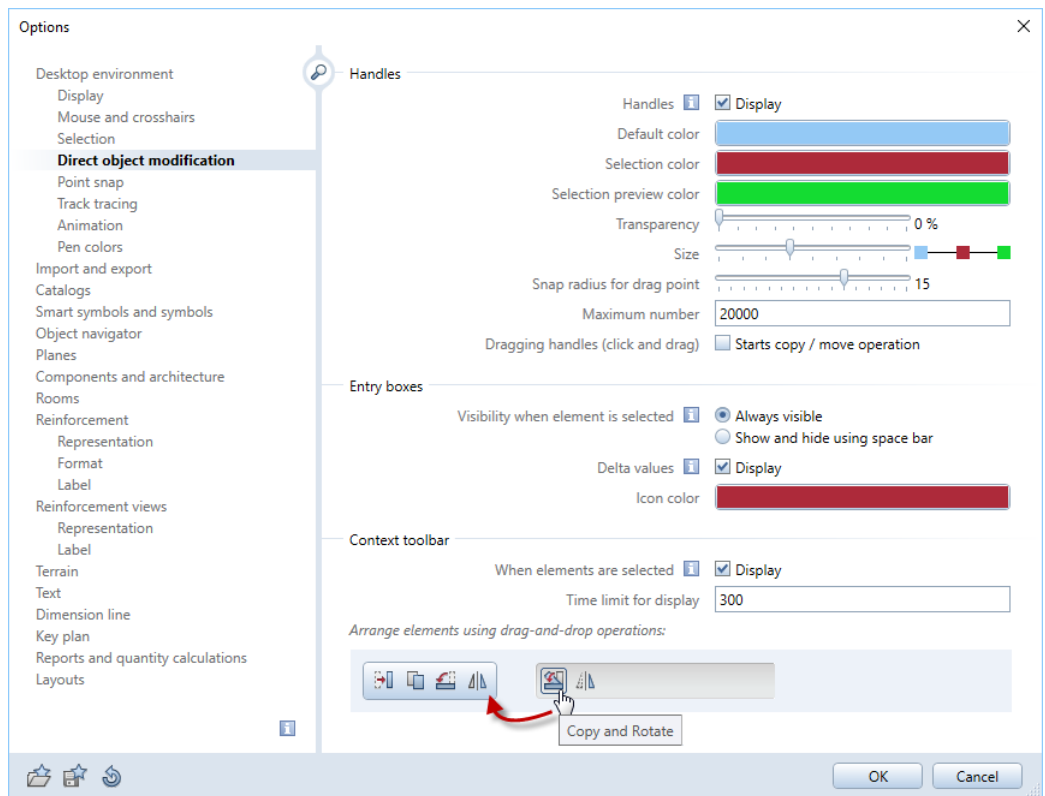
- 2 Point to a selected element, for example, a line.
- 3 The context toolbar for direct object modification opens, providing four tools:




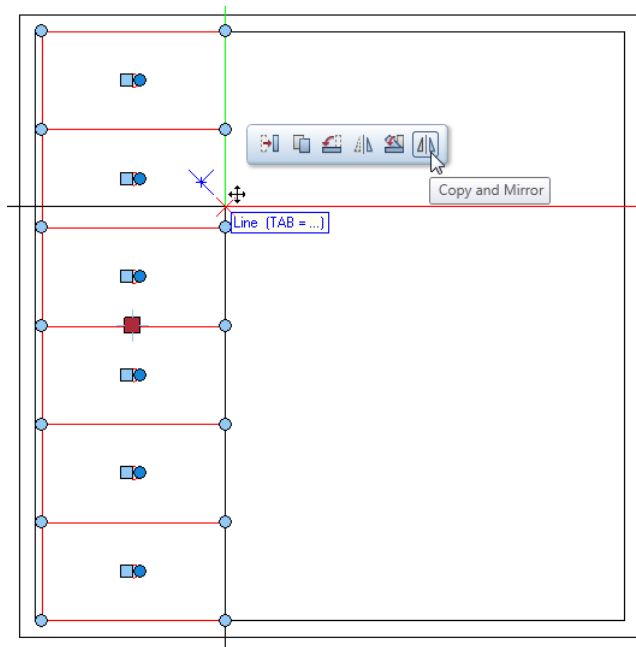
You can add two more tools to it.



To do this, click  **Options** ( **Default Settings** dropdown list on the Quick Access Toolbar).

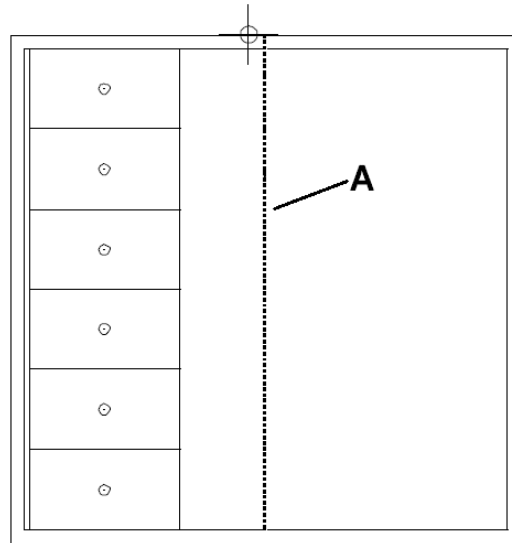
- 4 Open the **Desktop environment – Direct object modification** page and drag the  **Copy and Rotate** and  **Mirror without Copy** tools one after the other onto the context toolbar.



- 5 Click **OK** to close the **Options** dialog box.
- 6 Select the drawers again by enclosing them in a selection rectangle.
- 7 Point to a selected element, for example, a line.
The context toolbar opens. As you can see, it includes six tools.
- 8 Click  **Copy and Mirror** on the context toolbar.

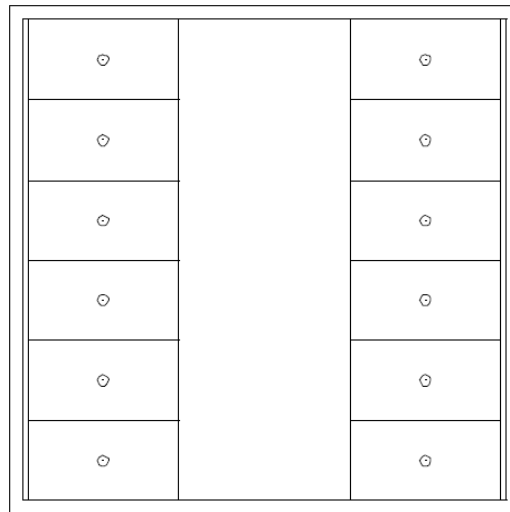


- 9 Define the center axis of the file cabinet as the mirror axis.
Move the crosshairs to the top line of the file cabinet, open the shortcut menu and click  **Midpoint**.
Allplan snaps to the midpoint; this point defines the first point of the mirror axis (see illustration below).
- 10 To define the second point of the mirror axis, move the crosshairs to the bottom line of the file cabinet and, on the shortcut menu, click  **Midpoint** again.



A = Mirror axis

Allplan copies the drawers to the right.




11 Press ESC to quit direct object modification.


Creating a knob for the door in the middle

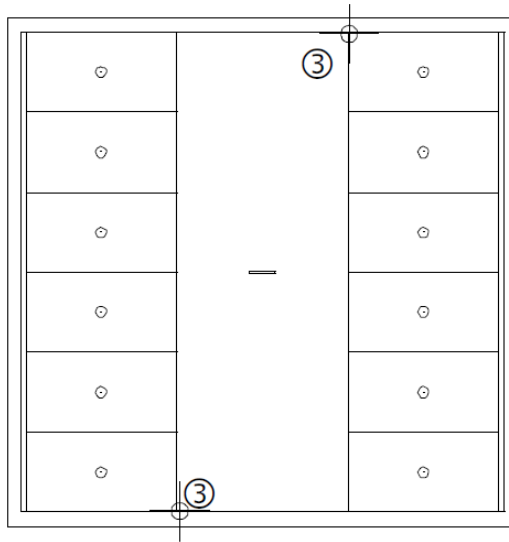
Finally, you will draw a knob for the door in the middle. To do this, you will use the **Midpoint** and **Based on center** options.

To create a knob for the door in the middle

- 1 Click  **Rectangle**.
- 2 Click **Based on center** in the input options.



- 3 Open the shortcut menu and choose  **Midpoint**. Then click two diagonally opposite corners of the door in the middle. This defines the center of the rectangle.
- 4 Enter **0.1** for the length and press ENTER to confirm.
- 5 Enter **0.01** for the width and press ENTER to confirm.







- 6 Press ESC to quit the tool.
-

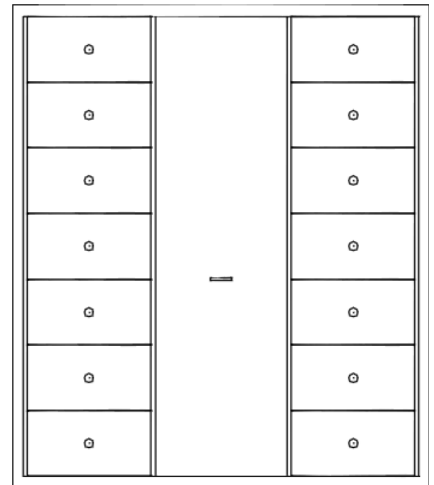
Task 2: modifying the file cabinet

Based on the file cabinet designed beforehand, you will now create a new cabinet that is 2.1m high. This cabinet has seven drawers. Start by copying the design to a new drawing file. Then you will modify the design. In this section, you will find out about the two most important modification tools: **Parallel to Element** and **Stretch Entities**.

Tools:

-  Copy, Move Elements between Documents
-  Stretch Entities
-  Parallel to Element
-  Brackets


Objective:

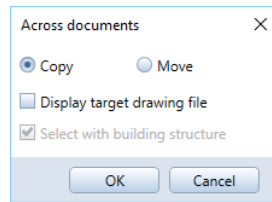


Copying a drawing file

Begin by copying the file cabinet you created in the last exercise to a new drawing file.


To copy the drawing file with the file cabinet

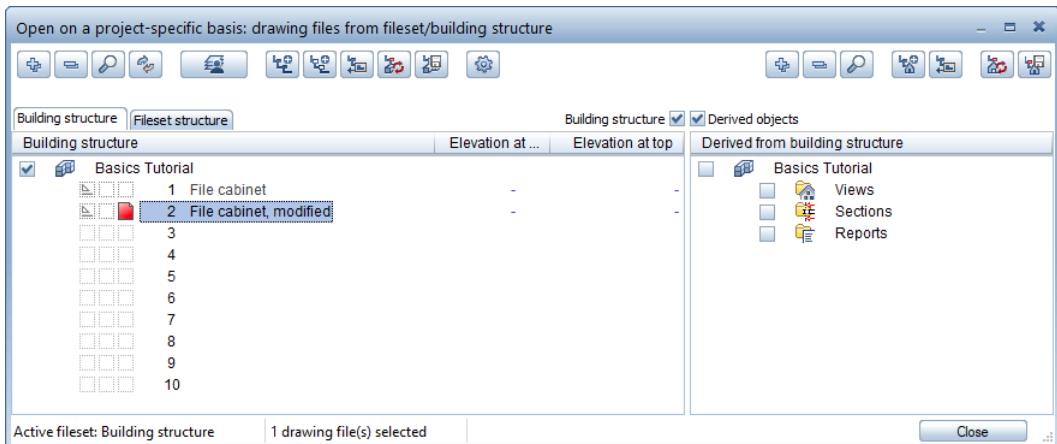
- Only drawing file **1 File cabinet** should be open.
- 1 Click  **Copy, Move Elements between Documents...** in the dropdown list of the Allplan icon on the title bar.
- 2 Activate **Copy** and click **OK** to confirm.




- 3 Select an empty drawing file (for example, drawing file **2**) and click **OK** to confirm.
- 4 The system prompts you to select the elements you want to copy to the new drawing file.

You want to copy all elements in the drawing file. Therefore, right-click in the workspace twice or click **All** in the input options. This copies the file cabinet to the new drawing file.

- 5 Click  **Open on a Project-Specific Basis** (quick access toolbar) and select the drawing file to which you have just copied the file cabinet.
- 6 Enter a name for drawing file **2**, for example, **File cabinet, modified**.




- 7 Make drawing file **2** current, close drawing file **1** and close the dialog box.

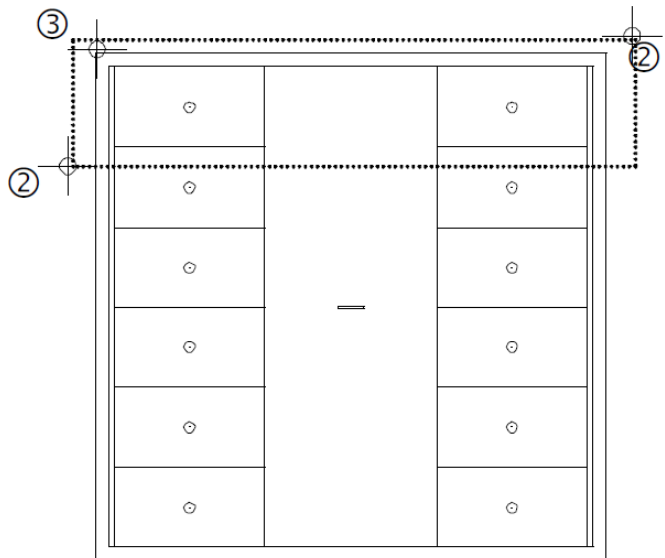
- Click  **Zoom All** (viewport toolbar) to display the file cabinet in its entirety on screen.
-

Stretching entities

The next step involves modifying the upper two corners of the file cabinet. This way, you will change the height of the file cabinet to 2.1 m. In addition, you will add two drawers using the **Copy** tool. To do this, you will use **direct object modification**.

To stretch entities

- Right-click in the workspace and select the  **Stretch Entities** tool on the shortcut menu.
- Select all the points on the entity you want to stretch. Make sure you select the two top drawers together.




- From point:*
Click the top left corner of the file cabinet.

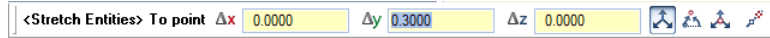
Tip: You can also enter the values in the dialog line without clicking a start point:

Δx dx = 0


Δy dy = 0.30

4 *To point:*

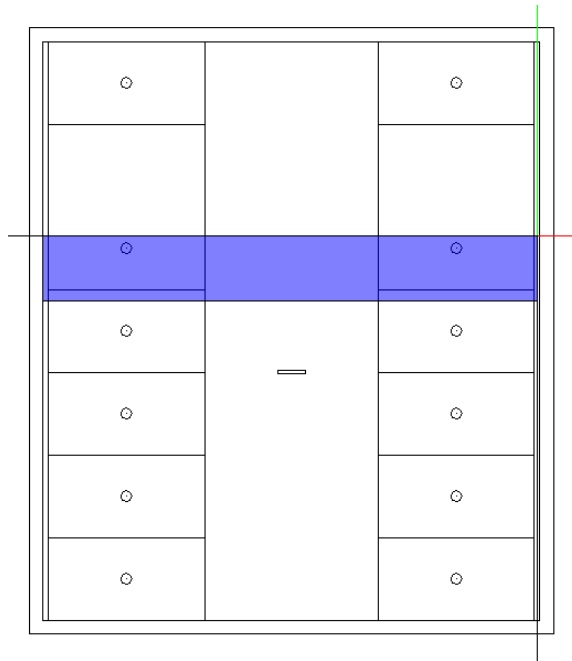
The file cabinet should be 2.1 m high; in other words, you need to lengthen the file cabinet by 0.3 m in the y-direction. Click  **Delta point** in the dialog line and enter Δy dy = 0.30.



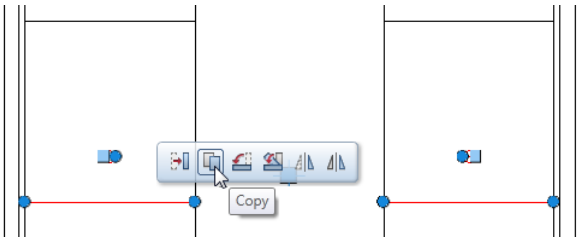
Press ENTER to confirm.

5 Press ESC to quit  **Stretch Entities**.

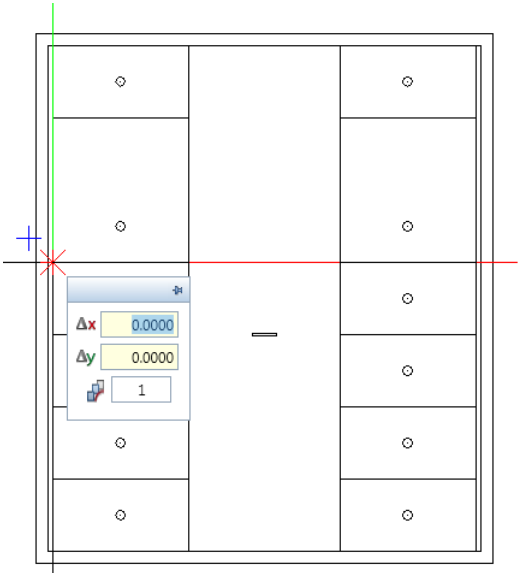
6 Select the elements that make up the two incomplete drawers (two lines and circles each) by enclosing them in a selection rectangle you open from bottom left to top right (positive x-direction) using the left mouse button.



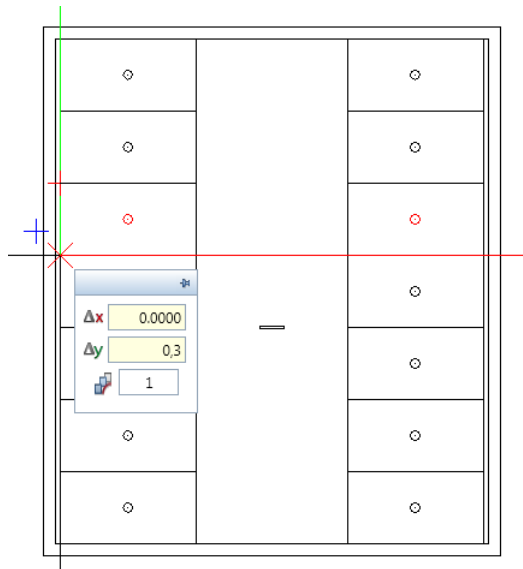
7 Point to one of the two selected lines and click  **Copy** on the context toolbar.



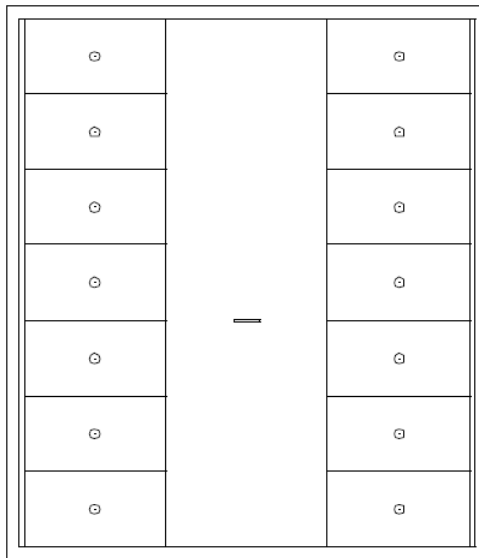
8 *From point:*
Click the bottom left corner of the incomplete drawer on the left.



9 *To point or enter number of copies:*
Press the TAB key to switch to Δy in the coordinate dialog box and enter **dy** = 0.30.




10 Press ENTER to confirm.



11 Press ESC.

A note on Selecting and modifying several elements and regions together using the brackets



As an alternative to the selection rectangle, you can use the brackets to select elements one after the other. Do the following:

- Activate an edit tool.
- Open the brackets by right-clicking in the workspace and selecting  **Brackets**.
- Click the elements one after the other or open selection rectangles around the elements you want to select.
- To unselect an element, simply click it again.
- Close the brackets.

Adding a frame

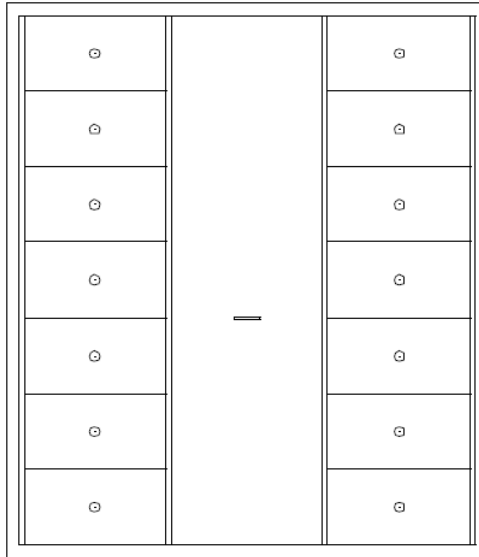
To finish, you can enhance the file cabinet by adding a frame to the door in the middle. To do this, you will use the **Parallel to Element** tool.

To add a frame

- 1 Click  **Line (2D Objects)** task area).
The system prompts you to select an element.
Click the inner cabinet edge on the left-hand side.
- 2 *Through point or offset:*
Enter **0.6** in the dialog line and press ENTER to confirm.
- 3 *Which side?*
Click in the workspace to the right of the line.
- 4 *Number:*
Enter **1** and press ENTER to confirm.
- 5 The  **Parallel to Element** tool is still active. The distance to the next line is calculated based on the new line you just created.
- 6 Enter **0.6** in the dialog line and press ENTER to confirm.

7 *Number:*

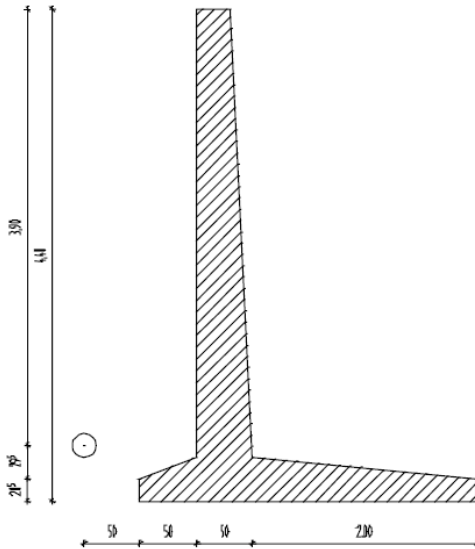
Enter **1** and press ENTER to confirm.



8 Press ESC to quit the tool.

Exercise 2: Retaining Wall with Drainage

In the following exercise, you will design a cross-section of a retaining wall with drainage.



You will use the tools in the **2D Objects**, **2D Areas**, **Filter** and **Change** task areas.

Task 1: designing a retaining wall with drainage

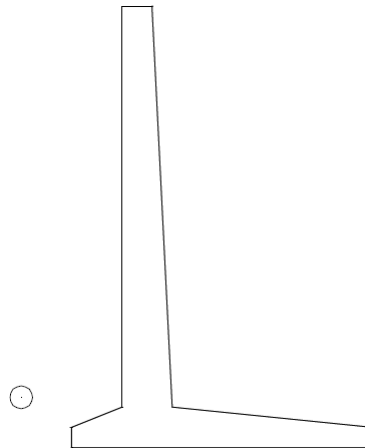
In this section, you will learn how to use delta points to create lines that are not parallel to the x-axis and y-axis. Delta points allow you to place a point at a specific distance from an existing point.

To do this, use  **Delta point** in the dialog line.

Tools:


-  Line
-  Delta point
-  Circle
-  Track line

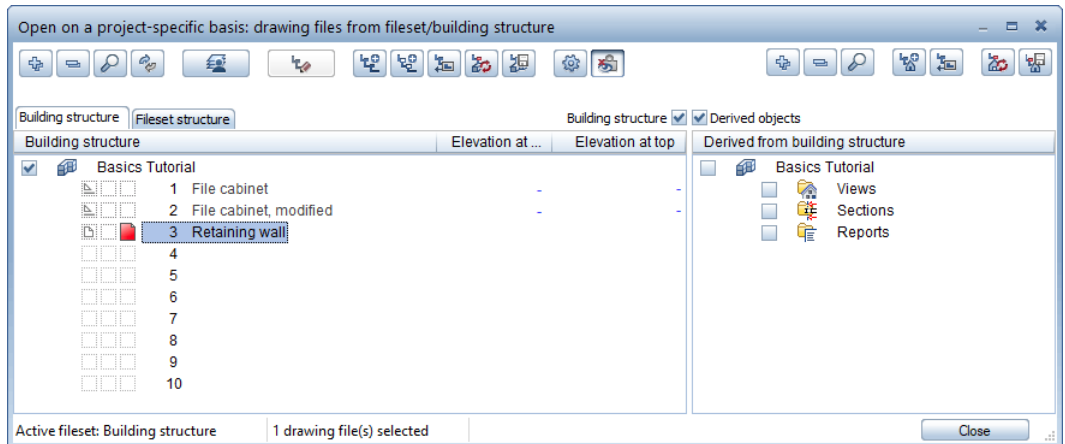
Objective:







Retaining wall of angular shape

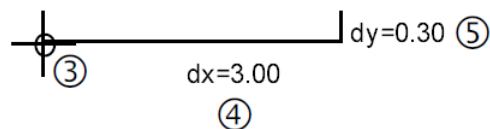
To draw the retaining wall


- 1 Click  **Open on a Project-Specific Basis** and open an empty drawing file. Name it **Retaining wall** and close all the other drawing files.






Tip: Check that **Element** is active in the  **Point snap options**. To check this, right-click to open the shortcut menu. Click  **Point snap options**.

- 2 Click  **Line** in the **2D Objects** task area.
- 3 The **Line** Context toolbar box opens. Select  **Polyline** and click where you want the line to start.
- 4 *<Line> To point*
Enter Δx $dx = 3.00$ in the dialog line and press ENTER to confirm.
- 5 *<Line> To point*
Enter Δy $dy = 0.30$ in the dialog line and press ENTER to confirm.



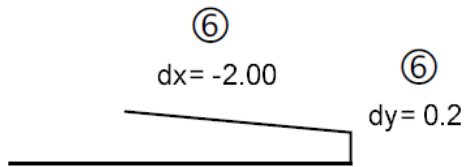
The next point is not at right angles to the previous point. However, you know the offset values in the x-direction and y-direction. Use  **Delta point** to place this point.

Tip: Pressing the TAB key takes you to the next data entry box in the dialog line. Press ENTER to accept the values.



- 6  **Delta point** is active in the dialog line.
Enter the following values:
 $\Delta x = -2.00$
 $\Delta y = 0.20$



- 7 Press ENTER to confirm.

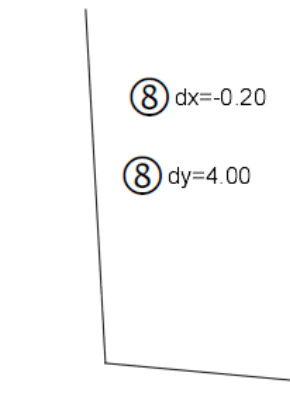


Use  **Delta point** again to place the next point.

- 8 Enter the following values in the dialog line:
 $\Delta x = -0.2$
 $\Delta y = 4.0$



- 9 Press ENTER to confirm.



10 You can enter the next two lines in two ways:


As these two lines are at right angles to the previous point, you can create them by entering values directly in the dialog line or using the track lines.

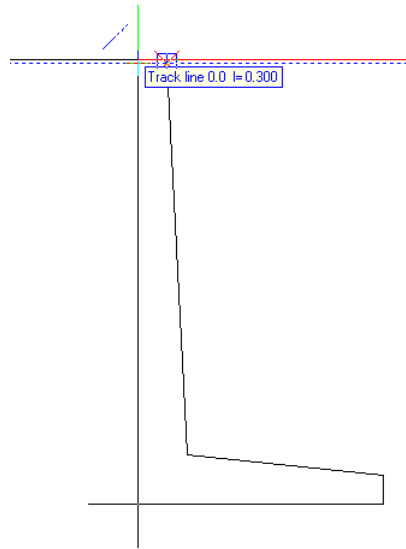
First option:


Draw the horizontal line by entering the length in the x-direction in the dialog line: $\Delta x = -0.30$ ENTER

Draw the vertical line by entering the length in the y-direction in the dialog line: $\Delta y = -4.00$ ENTER

Second option:

Activate track tracing by clicking  **Track line** in the dialog line. Point to the end of the line you created last. Move the crosshairs slowly to the left. The 0.0-degree track line appears.

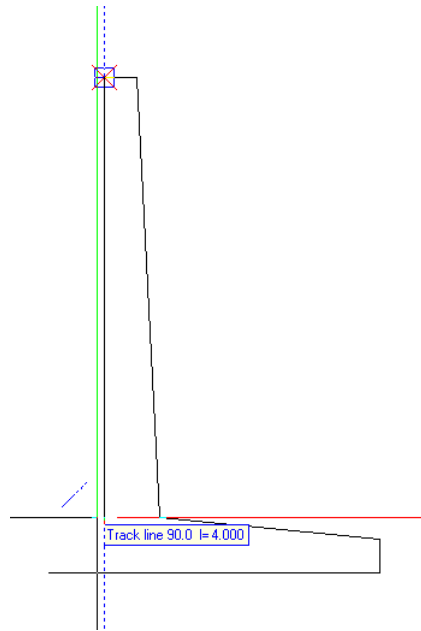


As soon as Allplan displays $l = 0.300$ for the offset, click this point or enter 0.3 m for  **Offset to reference point** in the dialog line. Then press ENTER to confirm.



Note: Track lines indicate the current length. This length is a multiple of the **Grid length** you can specify beside **Rasterize length** in the dialog line. If you cannot define a specific length using the track lines, it is a good idea to change the **Grid length**.

To draw the second line using track tracing, slowly move the crosshairs vertically downwards. The 90.0-degree track line appears.

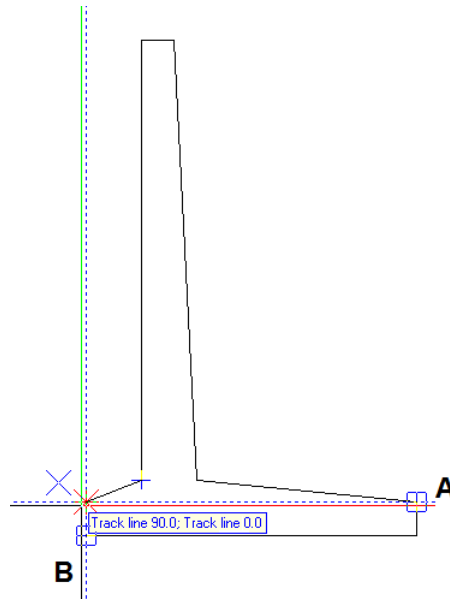


As soon as Allplan displays $l = 4.000$ for the offset, click this point or enter 4 m for **Offset to reference point** in the dialog line. Then press ENTER to confirm.




- 11 You can also use track tracing to place the next point. Point to point **A** and wait at least 500 milliseconds. The program creates a track point based on the point snapped.

- 12 Now point to point **B** (= first point of the design). Wait there too, until the program has created track points based on points **A** and **B** – this is indicated by a blue square.
- 13 Starting at point **B**, move the crosshairs vertically upwards as far as the point where the 90.0-degree track line and the 0.0-degree track line intersect. Click it.









See also:

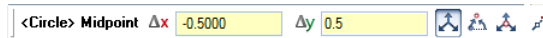
 **Track tracing** is described in detail in the Allplan help.

- 14 Switch track tracing off by deactivating  **Track line** in the dialog line.
- 15 Finish creating the retaining wall by clicking the start point of the first line (point **B**).
- 16 Press ESC twice to quit the **Line** tool.

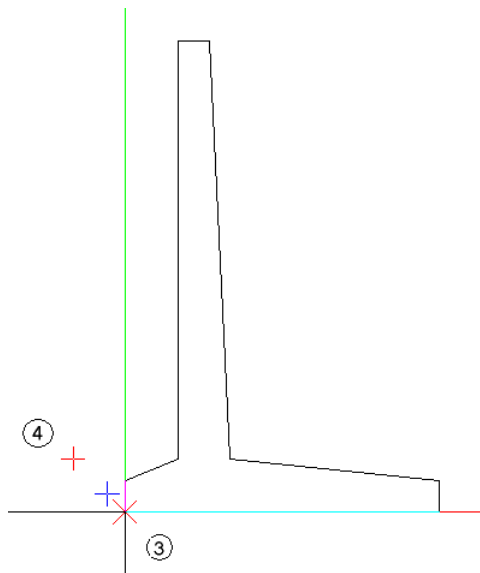
Drainage

To design the drainage

- 1 Click  **Circle** (2D Objects task area).
- 2 The **Circle** Context toolbar opens. Click  **Circle based on center** and .
- 3 Point to the bottom left corner of the retaining wall. This point gets a red X.
- 4  **Delta point** is active in the dialog line. Enter the following values:
 $dx = -0.5$
 $dy = 0.5$



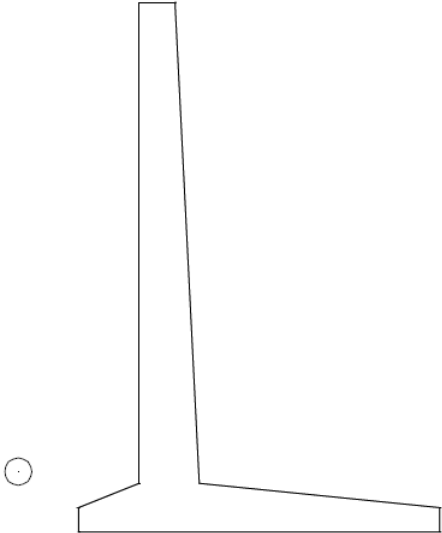
Press ENTER to confirm.



This defines the center of the circle.

- 5 Enter a radius of **0.1** in the dialog line and press ENTER to confirm.





6 Press ESC to quit the tool.



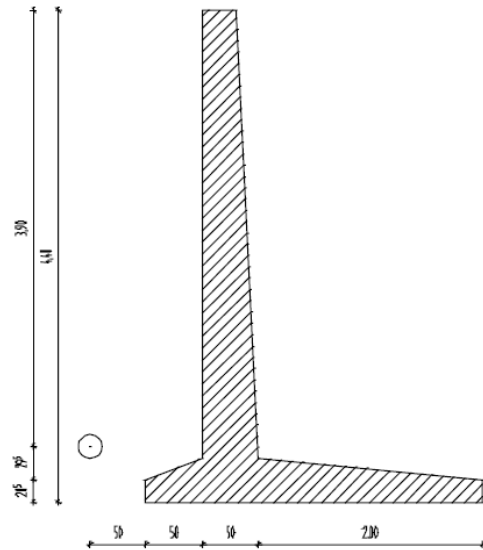
Task 2: hatching

Next, you will apply hatching to the retaining wall. You will also learn about the principles of entering polylines. The polyline entry tools are used by just about all functions that expect you to define polylines or polygon-bounded areas (e.g. hatching, pattern, fill).

Tools:


-  Hatching
-  Filter by Element Type
-  Area detection
-  Modify Format Properties
- Hatching defaults

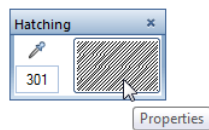
Objective:



Applying hatching to the retaining wall

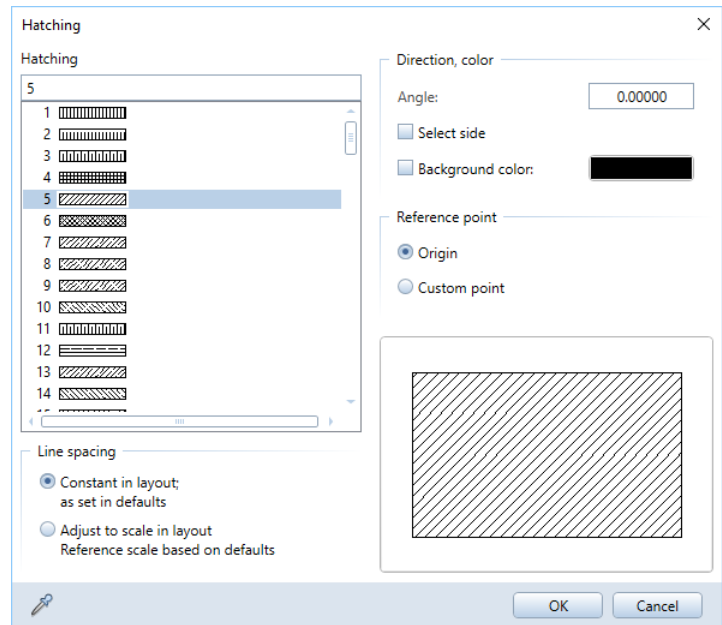
To apply hatching to the retaining wall

- 1 Click  **Hatching** (2D Areas task area).
- 2 On the **Hatching** Context toolbar, click **Properties**.



3 Select hatching style **5** and set the parameters as shown below:

- **Line spacing area:**
Constant in layout, as set in defaults
- **Reference point area:**
Origin

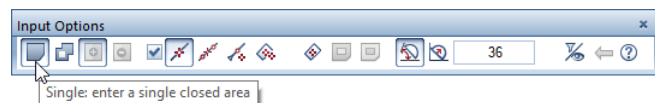


4 Click **OK** to confirm the settings.

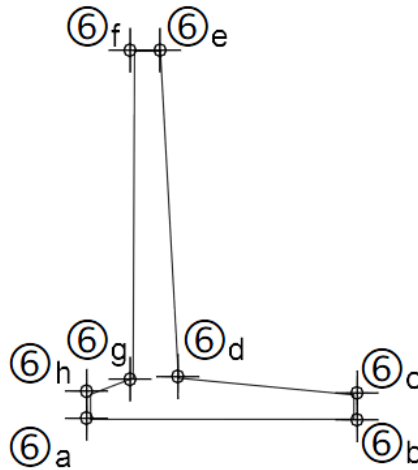
5 Click **Single** in the input options.

Tip: When you click **Multi** in the input options, you can enter as many areas as you want.

After you have pressed ESC to finish entering the polyline, Allplan applies hatching to these areas in one go.

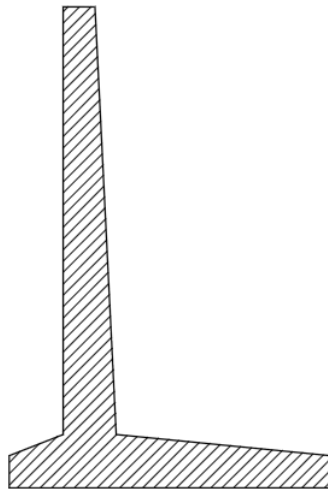


- To define the area for hatching, click the corners of the retaining wall one after the other.



- To close the polyline, press ESC after you have clicked the last point or click the first point again.

Allplan applies the selected hatching to the retaining wall.





- Press ESC to quit the  Hatching tool.

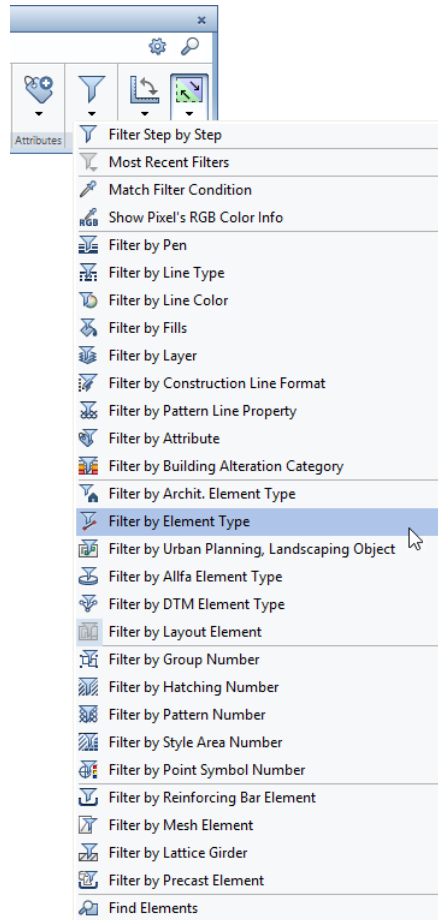
Copying the outline of the retaining wall

Apart from clicking each corner of a polyline (as described above), you can enter polygonal-bounded areas in several ways. Using the retaining wall as an example, the following exercise will show you how to do this.


You will start by copying the wall so that you have several copies for experimenting. To make sure that the hatching is not included in the copies, you will apply a filter.

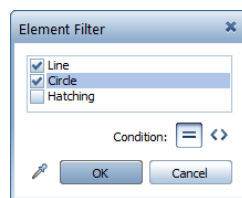
To copy the outline of the retaining wall

- 1 Right-click in the workspace and select  **Copy** on the shortcut menu.
- 2 *<Copy> Select the element(s) you want to copy*
The **Filter** task area has not been expanded yet. Point to the icon in this area and left-click within the blue part near the bottom of the icon. The dropdown list opens, displaying all the tools in the **Filter** task area.
Click  **Filter by Element Type**.

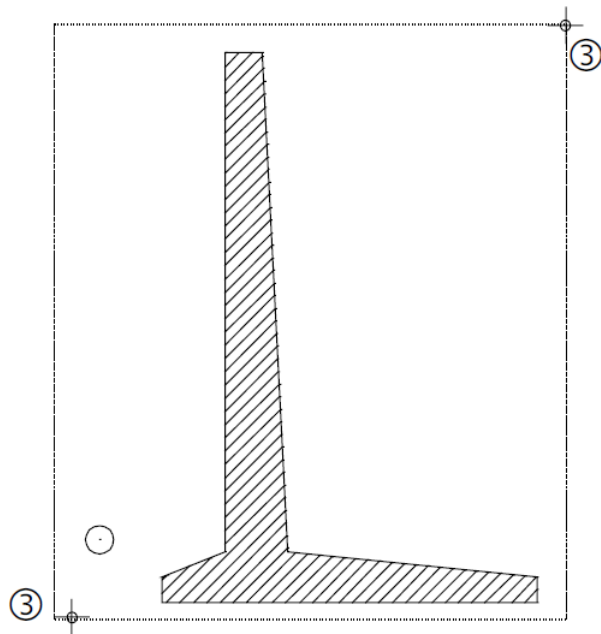


- 3 Select **Line** and **Circle**. Then click **OK** to confirm.

Tip: You can also use the properties of the outline as a filter. Click  **Match parameters** and then click the element.



- 4 *<Copy> Select the element(s) you want to copy <=Line =Circle>*
Enclose the retaining wall in a selection rectangle.




As you have selected the **Line** and **Circle/ellipse** filters, only the outlines of the retaining wall and the drainage appear in the selection color.

5 *<Copy> From point*

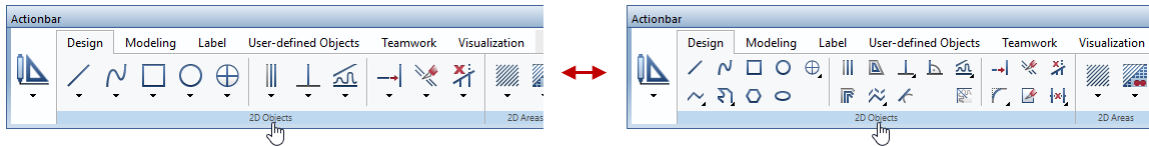
Specify the starting point for the copy and place the retaining wall anywhere in the workspace. The position is irrelevant. However, make sure that the two retaining walls do not overlap.

6 Press ESC to quit the  **Copy** tool.

7 Click  **Zoom All** to display the two walls in their entirety on screen.

Minimized task areas do not show all tools. To open the flyout menu of one of these tools, click the downward arrow. You can then see all the tools in the collapsed area.

You can maximize or minimize a task area by double-clicking the left mouse button within the name line of a task area.






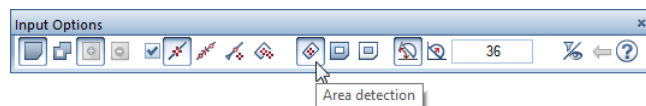
A maximized task area shows more tools, which can also have flyout menus.

Applying hatching using area detection

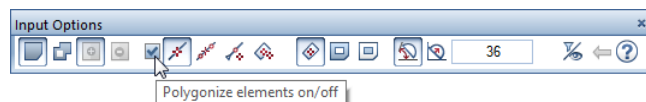
The next step is to apply hatching to the copy of the retaining wall. To do this, you will use a tool that automatically detects closed, de-limited areas.

To apply hatching using area detection

- 1 Click  **Hatching** (2D Areas task area).
- 2 **Hatching style 5** is still set on the **Hatching** Context toolbar. If it isn't, click **Properties** and select hatching style 5. Click **OK** to confirm.
- 3 Click  **Single** in the input options.
- 4 Select  **Area detection** in the input options.




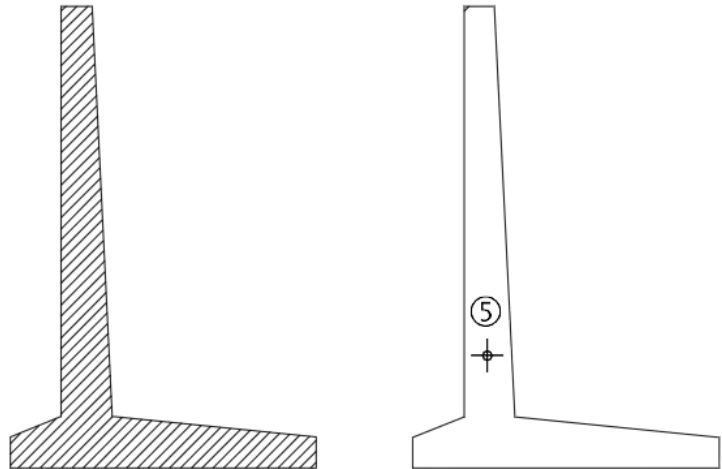
Note: You can only select  **Area detection** when **Polygonize elements** is active.




- 5 Click a point within the retaining wall.

Allplan automatically detects the outline, polygonizing the entire retaining wall.

As you have selected  **Single** in the input options, Allplan immediately applies the hatching.



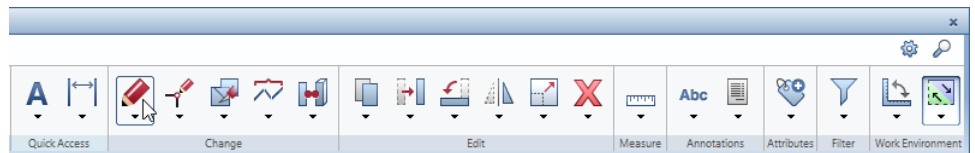
- 6 Press ESC to quit the  **Hatching** tool.

Modifying hatching

Next, modify the hatching pen.

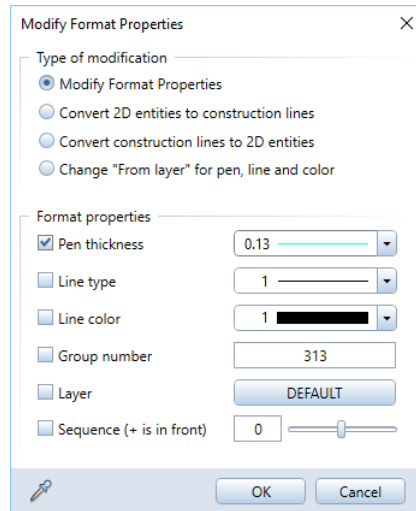
To modify the hatching pen

- 1 Click  **Modify Format Properties** in the **Change** task area.



- 2 To change the pen, open the **Pen thickness** list box and select pen number **7** with a thickness of 0.13 mm.

This automatically selects the **Pen thickness** check box.

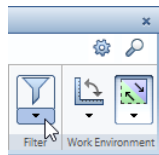




- 3 Click **OK** to confirm.

Allplan prompts you to select the elements you want to draw with the new pen. Here, too, use a filter.

Tip: You can combine as many filters as you need.

- 4 Point to the icon in the **Filter** task area and left-click within the blue part near the bottom of the icon.



- 5 Click  **Filter by Element Type** in the dropdown list.
- 6 Select **Hatching** and click **OK** to confirm.
- 7 Enclose the two retaining walls in a selection rectangle. As you have used a filter, Allplan only modifies the hatching.
- 8 Press ESC to quit  **Modify Format Properties**.


Hatching defaults

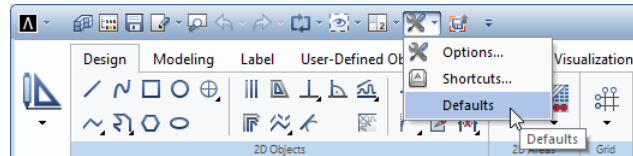
Allplan 2020 comes with a wide range of ready-made hatching styles. You can also define your own hatching styles or modify existing hatching styles.

If you have worked your way through the exercises step by step, you set the paths for patterns and hatching styles to **Project** when you created the project for this tutorial. In other words, any changes you make to defaults (e.g. hatching, pattern) only affect the current project.

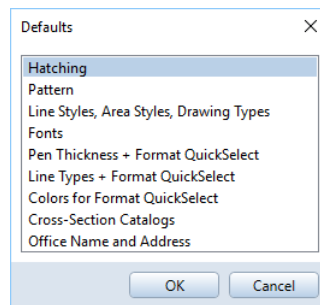
If the path is set to **Office**, however, you run the risk of modifying the office standard. This means that any changes you make will affect all projects based on the office standard.

To define or modify hatching styles

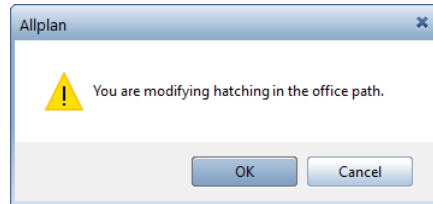
- 1 Open the  **Default Settings** dropdown list on the Quick Access Toolbar and select **Defaults**.



- 2 The **Defaults** dialog box opens. Select **Hatching** and click **OK**.

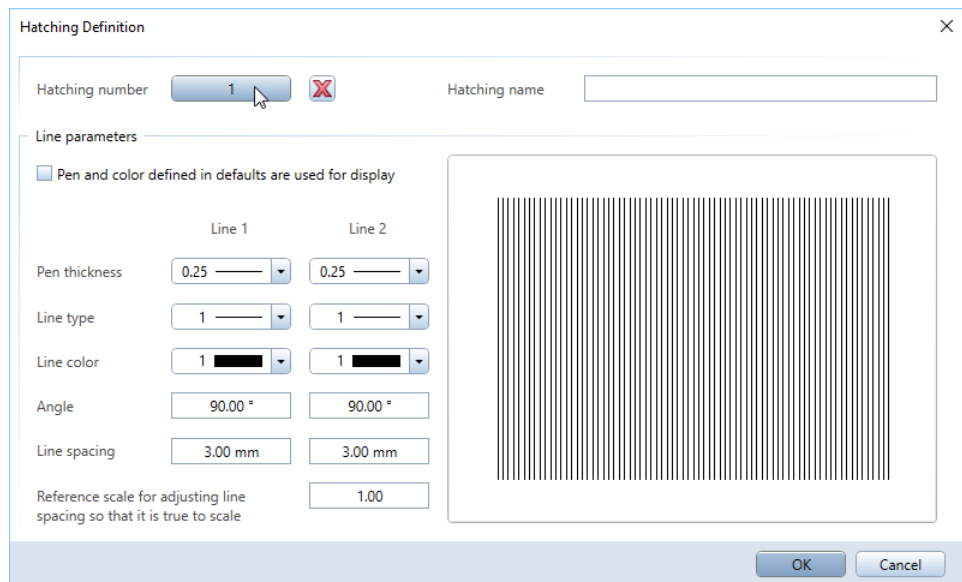


Note: If the **You are modifying the hatching in the office path** message appears, the settings you are about to make will modify the patterns and hatching styles in the **office** path.

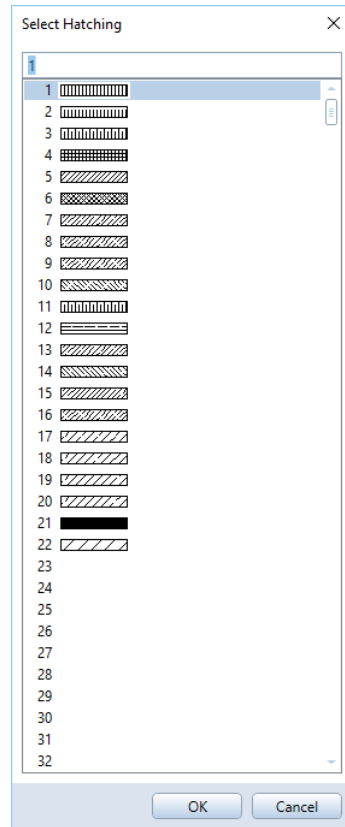


In this case, click **Cancel** and set the path to **Project**, which is described in the following section.

- 3 Click the button beside **Hatching number** in the top part of the **Hatching Definition** dialog box.



- 4 Select a hatching number in order to modify it or select an unassigned number to define a new hatching style.



- 5 Make settings in the **Hatching Definition** dialog box.


Note: You can use the **Pen and color defined in defaults are used for display** option to specify whether you want to use the pen set in the **Properties** palette or the pen defined in this dialog box.


- 6 Click **OK** to confirm the dialog box. If you have changed the defaults, confirm the following prompt by clicking **Yes**.

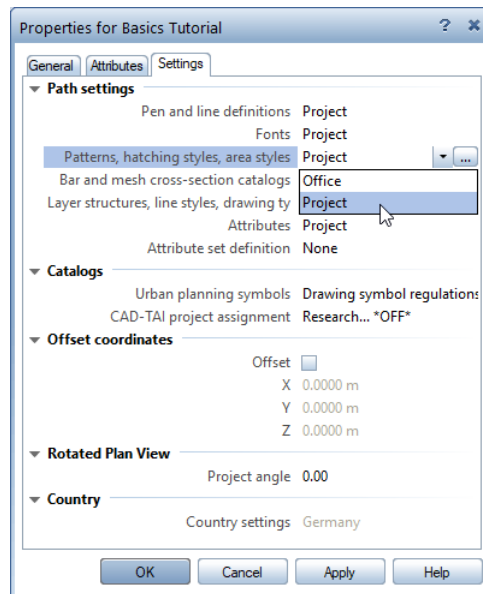
The following section shows how to switch the path settings for patterns and hatching styles to project. You only need to do this

when you see the **You are modifying the hatching in the office path** message after you have selected the hatching defaults.

To switch the path settings for patterns and hatching styles to project

Tip: You can also access the path settings by clicking  **New Project, Open Project...** on the Quick Access Toolbar. Open the shortcut menu of the **Basics Tutorial** project and click **Properties...**

- 1 Click  **ProjectPilot** in the dropdown list box of the Allplan icon on the title bar.
- 2 Open the **Projects** folder.
- 3 Right-click the **Basics Tutorial** project and select **Properties**.
- 4 Open the **Settings** tab and set the **Path settings** for **Patterns, hatching styles, area styles** to **Project**.

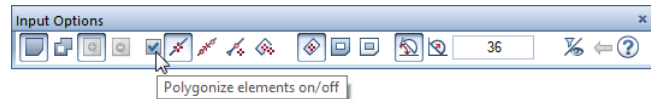


- 5 Click **OK** to confirm.
Allplan copies the office standard to this project.
- 6 Close **ProjectPilot** by clicking **Exit** on the **File** menu.

Polyline entry tools

When working with Allplan 2020, you will find that the polyline entry tools considerably facilitate the process of identifying points and elements. They are used by countless Allplan tools where you need to define polylines or polygonal-bounded areas (e.g. fills, patterns, slabs, roof outlines ...).

The polyline entry tools are integrated in the **Input Options** and open automatically when you select a tool for which they are available.



Select the check box in the input options to activate the polyline entry tools.

Input options for entering polylines, overview

The **Input Options** open whenever you select a tool that uses polyline entry tools (for example, pattern, hatching, room). You can use these options to specify how the polyline entry tools handle architectural lines and how these tools behave when you generate polylines based on existing elements.



Entering areas




Single

Use this to create **single**, discrete areas.

Multi

Use this to create areas composed of several polygons. Hatching, patterns or fills get the same group number; rooms are handled as a single entity. This way, you can define separate rooms, which Allplan then analyzes as a single room.

Plus, Minus

If you select  Multi, you can use  Plus and  Minus in the input options to specify whether each new polygon you enter will be added to or subtracted from the overall area.

Polygonizing existing elements

Polygonize elements on/off

When the check box is not selected, Allplan ignores elements when you click them. In this mode, Allplan only detects points.

When the check box is selected, Allplan polygonizes the elements you click. You can use the options next to this check box to specify the type of polygonization.

Polygonize entire element

This uses the entire element that you clicked. The starting point defines the direction of polygonization. If the last point in the polyline coincides with the start or end point of the element, you do not need to specify the direction.

Use this option when the outline consists of entire elements.

Define area of element to polygonize


With this option, the program prompts you for the area with every element you click (from point, to point).


Use this option when the outline consists of segments.

Enter reference point


With this option, the program prompts you for the reference point with every element you click. This option uses a point on the element you clicked with a defined offset to the reference point. Click to define a new reference point and then enter the offset to the reference point. Use this option when you want to specify the outline based on existing elements (when you enter a dormer, for example).



Area detection using additional point

 **Area detection using additional point** combines areas bounded by lines and polylines to form a polygon. Allplan uses the inner boundaries or outer boundaries depending on whether the temporary point is inside or outside the outline.


By selecting  **Element filter**, you can configure the program to ignore architectural lines when detecting areas.

Area detection

You can use  **Area detection** to automatically detect the outlines of closed polygons. You can use closed areas delimited by design entities of any kind as an outline polygon simply by clicking anywhere within the area. Allplan automatically detects and polygonizes the entire outline. The boundary elements can have points in common; they can intersect and they can touch. You can turn this automation feature on and off at any time.

Note: The **Minimum distance between points** setting in the  **Options** on the **Desktop environment** page also applies to the  **Area detection** tool. To make sure that Allplan detects outlines with small gaps, you can temporarily increase the minimum distance between points.

Island detection, **Inverse island detection**


When  **Island detection** is on, Allplan detects closed outlines within an area and cuts them out automatically.

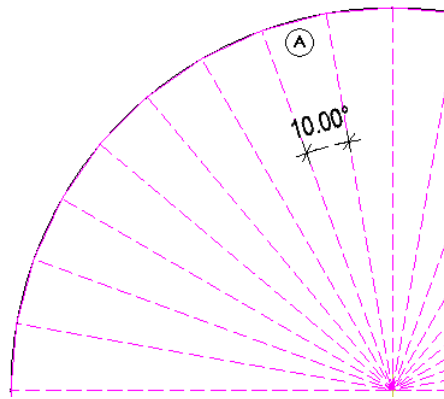
When you select  **Inverse island detection**, Allplan does not cut out closed outlines. Instead, Allplan fills these outlines with the selected surface element. It is the area around the 'island' that remains empty.

You can only use these tools together with  **Area detection using additional point** and  **Area detection**.

Number of segments / Rise


Number of segments

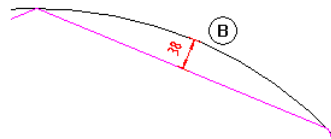
The polygonization value is interpreted as the number of segments. The value for  **Number of segments** defines the number of segments used to approximate a curve. In the case of a circle, for example, a value of **120** means that a full circle is approximated by a 120-sided polygon. The higher the degree of accuracy you require or the larger the radius, the higher the number of segments should be used to approximate a circle. You can enter a value between 36 and 360.



(A) Segments in circle = 36; this will produce an angle of 10°

Rise

The polygonization value is interpreted as the rise. The value you enter for  **Rise** defines the maximum rise of the secant relative to the arc (in mm). As a result, the curve is polygonized so that the maximum offset of the polyline's segment to the curve is less than or equal to the value you specified. This setting produces more accurate results than the number of segments.



(B) Rise (38mm or less)




Element filter

Element filter

Ignore plan lines of architectural elements

Ignore 2D surface elements (hatching, patterns, fills, bitmap areas, smart fit placements)

when using area detection

When you select the  **Element filter**, Allplan ignores lines of architectural elements and 2D surface elements when you use  **Area detection** or  **Area detection using additional point**. Use this option if you want to automatically apply surface elements like hatching, patterns and so on to adjacent outlines that are separated by arcs, splines or curves.

Here is some background information: Allplan polygonizes curves based on the number of segments specified.

When you enter a second (third...) area, **Area detection** may take a long time or produce incorrect results because Allplan detects both the outline of the surface (2D line) and the boundary line of the polyline of the first area.

Back, Help

Back

This undoes the last point you entered.




Help for entering polylines


This displays help for the **polyline entry tools**.

Additional tools in the dialog line

The dialog line offers the following drawing aids for entering points:

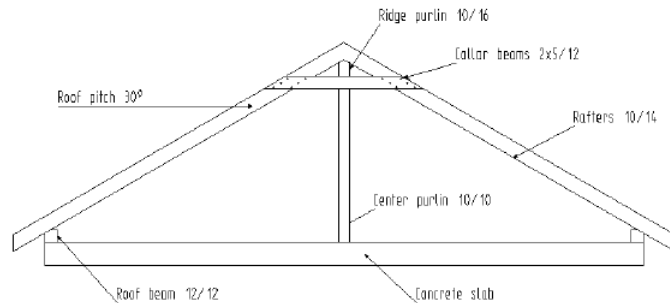


Icon	Function	Use
	Enter at right angles	The line can only be drawn at right angles to the current system angle.
	Enter using cursor snap	The line can only be drawn at specific angles.
	Cursor snap	Define the cursor snap angle here. The current angle is displayed.

Note: While you are entering a polyline, it can happen that you inadvertently click a point. You can use  **Back** in the input options to undo every point entered in reverse order.

Exercise 3: Purlin Roof

In this exercise, you will design a purlin roof. In addition, you will label the roof design and apply leaders.






You will use the tools provided by the **Draft** role – **Design** task – **2D Objects**, **Filter** and **Quick Access** task areas.

Task 1: designing a purlin roof

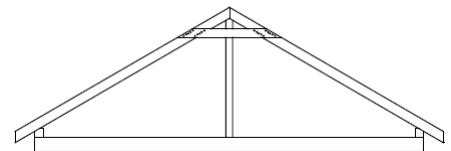
You will familiarize yourself with the **Intersect 2 Entities**, **Polar Coordinates** and **Division Point** tools.

Tools that were covered earlier in previous exercises (e.g. rectangle, parallel lines, brackets) are not described in detail in this exercise.

Tools:

-  Intersect 2 Entities
-  Division Point
-  Track Line




Objective:




Slab and rafters

The first part of this exercise involves designing the slab, the roof beams and the rafters. You will draw the slab as a rectangle and create the rafters as lines and parallel lines. First, you will design the rafter on the left-hand side and then copy it to the right-hand side.




To draw the slab and the rafters

- 1 Click  **Open on a Project-Specific Basis** and open an empty drawing file. Name it **Purlin roof** and close all the other drawing files.
- 2 Click  **Rectangle** (**2D Objects** task area) and select  **Based on diagonal line** in the input options
- 3 Draw the concrete slab as a rectangle.
 Δx X-coordinate = **5.74** (length), Δy Y-coordinate = **0.22** (width)

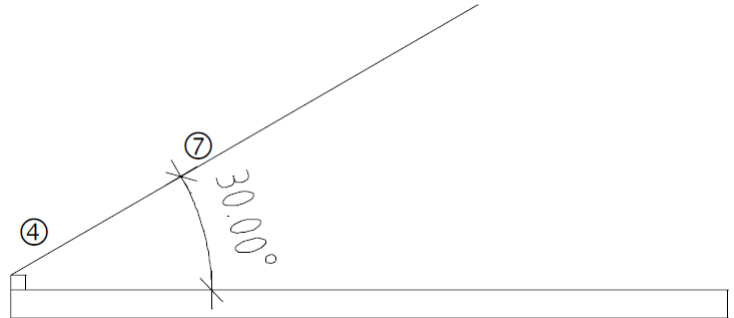



- 4 The  **Rectangle** tool is still open. Click the top left corner of the concrete slab and create a roof beam:
 Δx = **0.12** and Δy = **0.12**

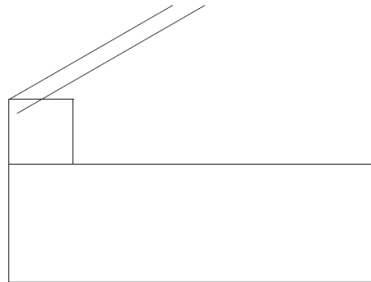



- 5 Click  **Line** in the **2D Objects** task area.
- 6 Click  **Individual lines** on the **Line** Context toolbar and specify where you want the line to start by clicking the top left corner of the beam (see below).
You will create the roof overhang later.
- 7 The roof pitch is 30°.
To draw a line at this angle, click  **Enter using cursor snap**.
- 8 Enter **30** to define the angle.
Now you can only draw the line at an angle of 30° (and in steps incremented by 30°).

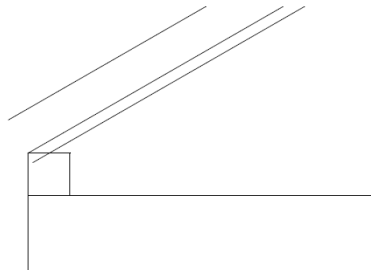
- 9 Draw the line as shown below and place its end point by left-clicking. For the time being, the length of the line is not important. You can delete redundant segments later.



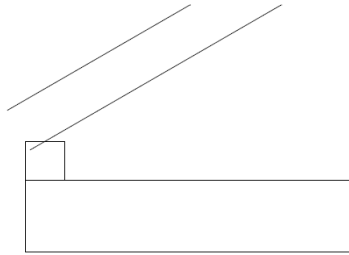
- 10 The rafter is to rest on the roof beam. Click  **Parallel to Element** (2D Objects task area) and create the bottom edge of the rafter. Enter **0.03** to define the offset.




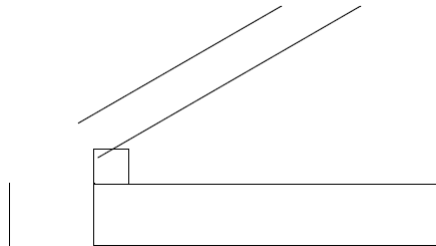
- 11 The  **Parallel to Element** tool is still active. To create the top edge of the rafter, enter **-0.14** for the offset (opposite direction!) and press ESC to quit the tool.





- 12 Right-click the line in the middle and select **Delete** on the shortcut menu to remove the reference line.



- 13 The next step is to create the vertical end of the rafter.
Click  **Parallel to Element** again. To define the reference element, click the left edge of the slab and enter **0.30** for the offset (= roof overhang).

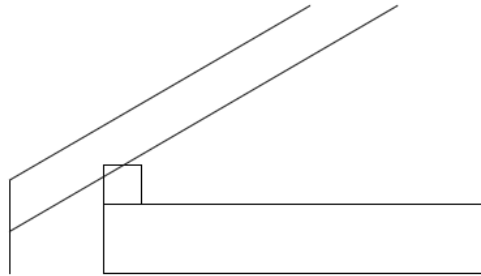


- 14 Now lengthen the top and bottom edges of the rafter as far as the point where they intersect the vertical edge. To do this, use the  **Intersect 2 Entities** tool.


Right-click the top edge of the rafter and select  **Intersect 2 Entities** on the shortcut menu.

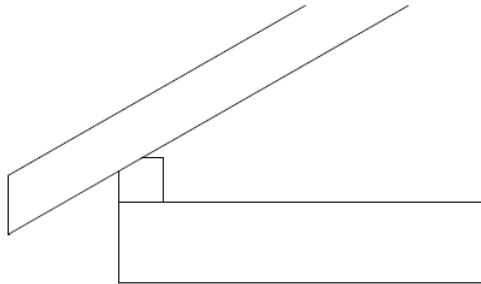
- 15 To define the second element, click the vertical edge of the rafter.

- 16 Click the bottom edge of the rafter and then the vertical edge.



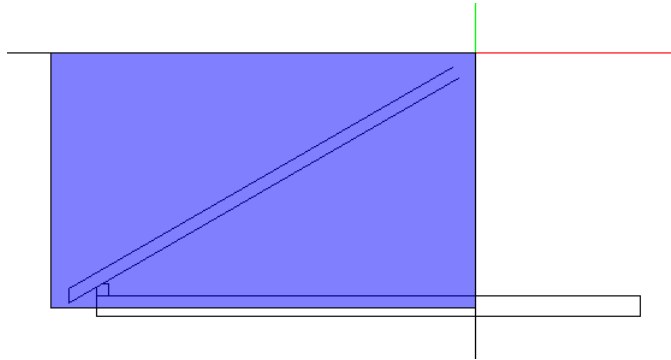
Allplan intersects the lines. Next, you will delete the redundant line segments.


- 17 Right-click one of the lines you want to delete and select  **Auto-Delete Segment**. Click the protruding line segments.

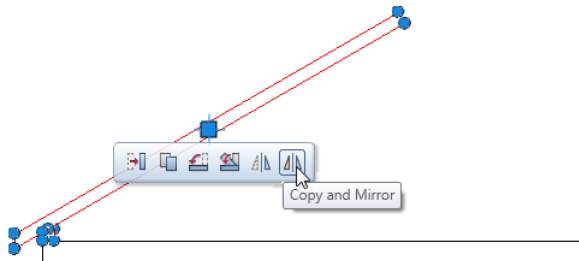



The rafter on the left is complete. You will mirror this rafter across a vertical line which passes through the middle of the roof beam, thus producing the rafter on the right.

- 18 Use the left mouse button to open a selection rectangle from bottom left to top right (positive x-direction), thus selecting the rafter on the left and the roof beam on the left.



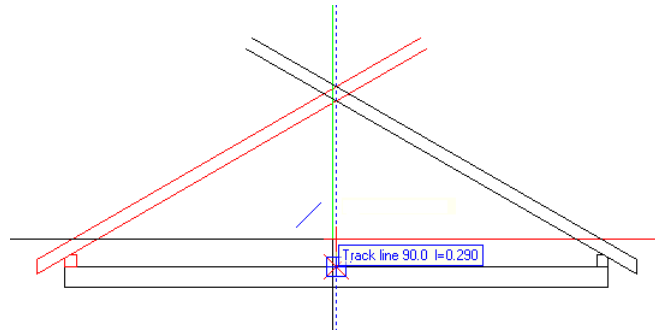
- 19 Point to a line of the rafter and click  **Copy and Mirror** on the context toolbar.




- 20 Now it is a good idea to select track tracing, as it helps you enter the mirror axis.
Press the F11 key to activate track tracing.
- 21 *Place point 1 for mirror axis:* The first point of the mirror axis is the center of the beam. Select  **Midpoint** on the shortcut menu and click the top edge of the beam.
A red cross indicates the center of the beam. Click it.
- 2nd point of mirror axis:* Using track tracing, you can display the track line that is perpendicular to the first point of the mirror axis (= midpoint of the top edge of the beam). Move the crosshairs roughly at a 90-degree angle above or below the first point of

the mirror axis. The 90.0-degree track line appears. Click this line wherever you want.

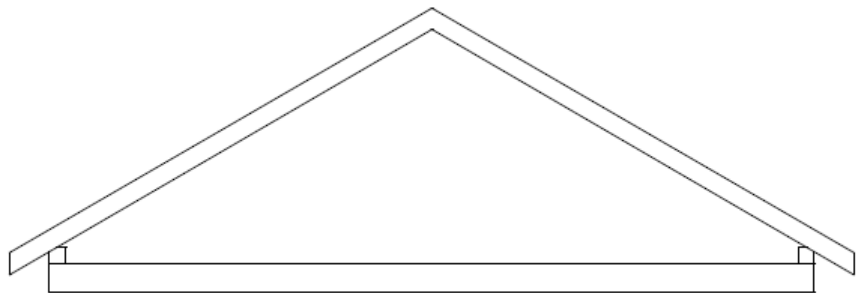
Allplan creates a vertical mirror axis, mirroring and copying the selected elements.





22 Press ESC to finish.

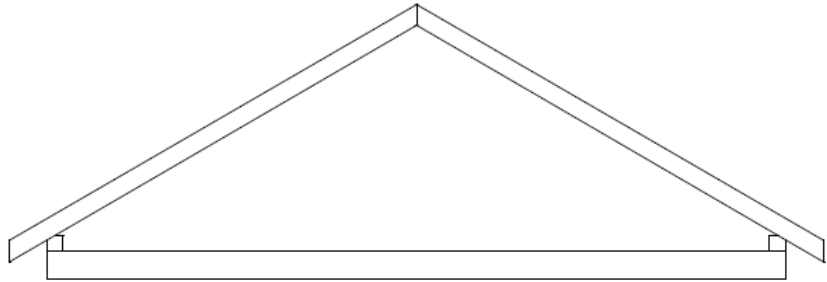
23 To delete the protruding line segments, open the shortcut menu of one of these line segments and click  **Auto-Delete Segment**.


24 Click all protruding line segments. The result should look like this:



25 To draw the line between the two rafters, click  **Line** and select  **Individual lines**.

26 Draw a vertical line as shown below.



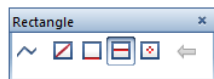
27 Press ESC to quit the  **Line** tool.

Ridge purlin and collar beam


Next, you will draw the ridge purlin, the center purlin and the collar beam. Begin by drawing the ridge purlin as a rectangle. Then create the collar beam and the center purlin by intersecting two elements and drawing a parallel line.

To draw the ridge purlin and the collar beam

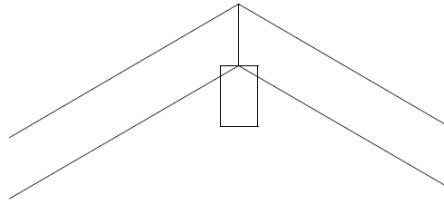
- 1 Click  **Rectangle** and select **Based on center line** in the input options.




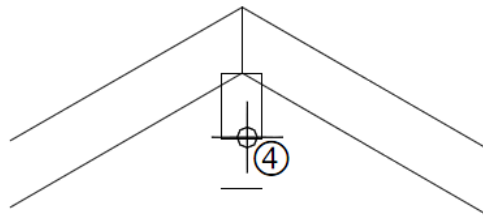
- 2 *Start point*: Click the bottom point where the two rafters intersect.


End point: Click  **Delta point** in the dialog line and enter the following value for the **y**-direction: **-0.16**


Point or half the width: Enter half the width of the ridge purlin: **0.05**

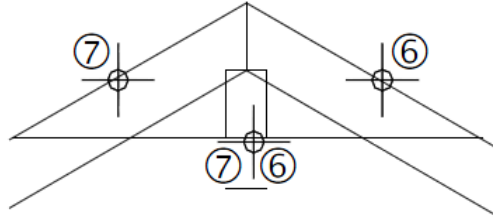




- 3 Use the elements of the ridge purlin to create the center purlin and the collar beam.
- 4 Draw the bottom edge of the collar beam based on the bottom edge of the ridge purlin. Click  **Parallel to Element** and enter **0.12** for the offset.



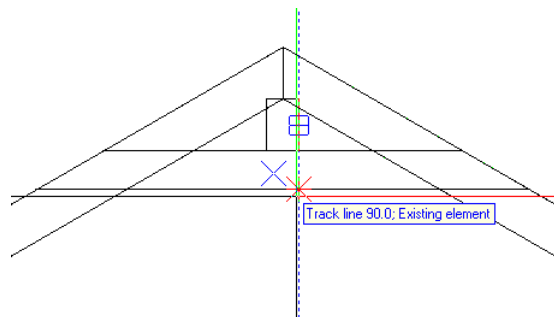
- 5 You want to make the bottom edge of the ridge purlin intersect the two outer edges of the rafters.
- 6 To do this, point to the bottom edge of the ridge purlin. Open the shortcut menu and click  **Intersect 2 Entities**. This selects the first element. To define the second element, click the right outer edge of the rafter.

- 7  **Intersect 2 Entities** is still active. Now make the bottom edge of the ridge purlin intersect the outer edge of the rafter on the left.

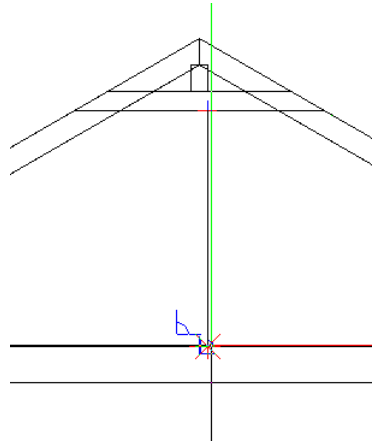



- 8 Using the same approach, make the bottom edge of the collar beam intersect the outer edges of the two rafters.
- 9 Use track tracing to join the two vertical edges of the ridge purlin with the top edge of the slab.
Select the  **Line** tool and click  **Individual lines**.
- 10 Point to the vertical, right-hand edge of the ridge purlin and then move the crosshairs in a vertical direction.

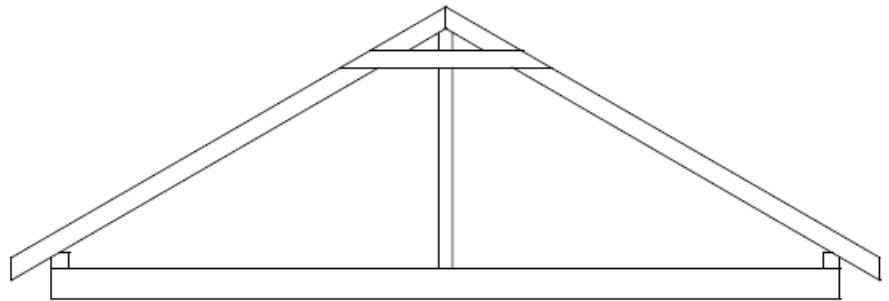
The 90.0-degree track line appears. Move the crosshairs along this track line until Allplan displays the point of intersection with the collar beam. Click this point.



- 11 Follow the track line as far as the point of intersection with the top edge of the slab and click this point.



- 12 Repeat steps 10 and 11 for the left edge of the ridge purlin.
- 13 Delete redundant line segments using  **Auto-Delete Segment** (shortcut menu of a line segment you want to delete).
The design should now look like this:







- 14 Press ESC to quit the  **Auto-Delete Segment** tool.

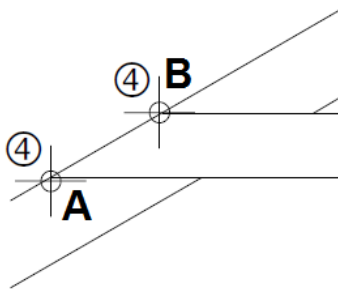
Construction lines

You will use six nails to fasten each rafter to the collar beam. First, create a grid consisting of lines in construction line format. To do this, use the **Division point** tool provided on the shortcut menu when a tool is active (e.g. **Line**). This grid will help you place the nails later. You can use the **Division point** tool to address division points of lines or other design entities. The nails will be placed on the points where the grid lines intersect.

Tip: The color and line type of the construction lines are based on the settings you have made in the **Options - Desktop environment - Display** page.

To draw horizontal construction lines

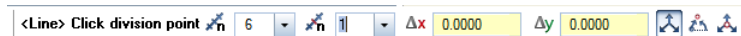
- 1 Draw the grid lines as construction lines.
To switch to construction line mode, select the  **Construction Line** check box in the **Properties** palette.
- 2 Click  **Line** in the **2D Objects** task area.
Click  **Individual lines** on the **Line** Context toolbar.
- 3 To specify where the line is to start, click  **Division point** on the shortcut menu.
- 4 Click the endpoints of the line to be divided.



A = Start point

B = End point

- 5 *Click division point:* Enter the number of divisions in the dialog line:
n = 6.



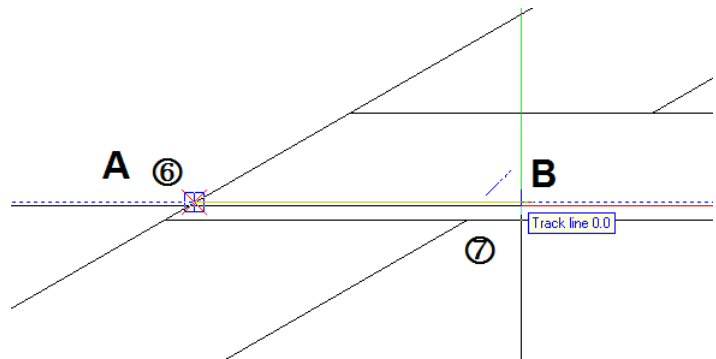
Allplan temporarily displays the division points on screen.

- 6 To specify the division point where you want the line to start, enter its number (1) in the dialog line and press ENTER to confirm. Allplan starts to count at point A (= the start point of the line you divided).

You can also define the division point by clicking it.



Tip: You can also address division points located on the extension of the division line by entering -1, -2, and so on.

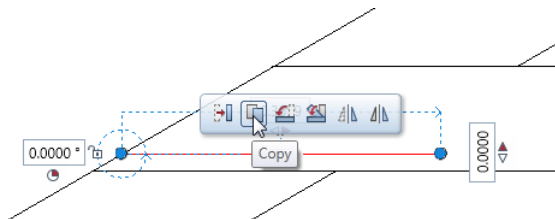
- 7 *To point or enter length:* As the line is horizontal, you can use the 0.0-degree track line to specify the end of the line. The length of the line is not important. However, make sure that it projects beyond the right edge of the rafter.



A = Division point 1

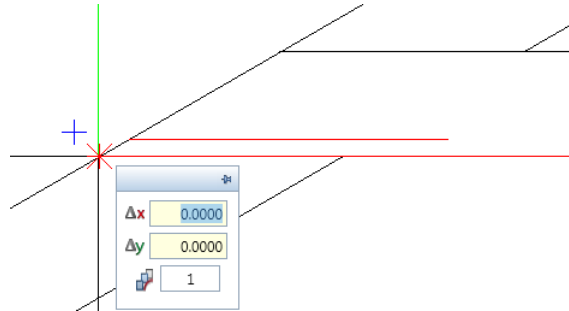
B = 0.0-degree track line

- 8 Press ESC to quit the  **Line** tool.
- 9 Now create four equidistant copies of the construction line and place them above the first one. Click the construction line and select the  **Copy** tool on the context toolbar.



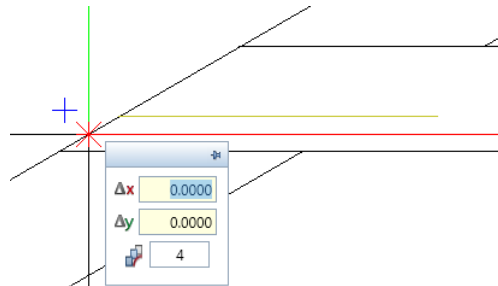

10 *From point or enter offset:*

Click the point where the outer edge of the rafter and the bottom edge of the collar beam intersect (see below).

11 *To point or offset:*

Enter the  **Number** of copies in the coordinate dialog box: **4**




12 Click the point where the outer edge of the rafter and the construction line intersect (see below).

13 Press ESC to quit the  **Copy** tool.

Now use **Division point** again to draw the sloping construction lines. Use **Polar coordinates** to specify the direction of the construction line.

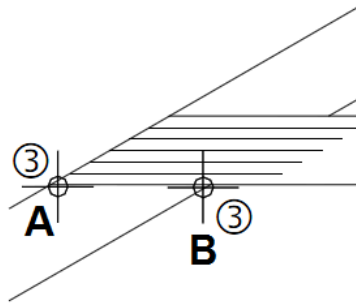
To draw sloping construction lines

➔  **Construction Line** mode is still active.

- 1 Click  **Line** on the **Actionbar - 2D Objects** task area.
- 2 Click  **Individual lines** on the **Line** Context toolbar.
- 3 Specify where the sloping construction line is to start:
 - a) Click  **Division point** (shortcut menu).
 - b) Click the end points of the line (see below).
 - c) Enter **5** for the number of divisions.
 - d) Click division point 1.




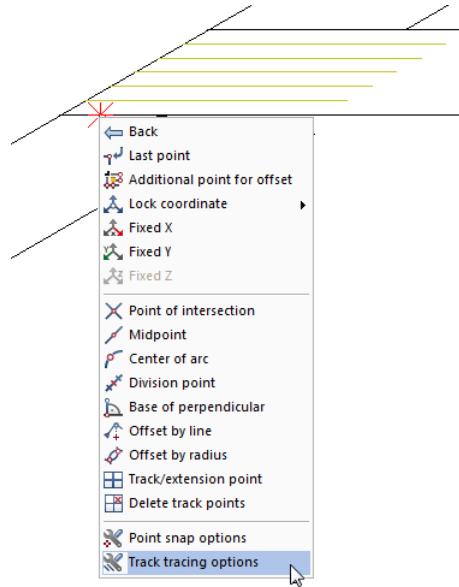
This defines the start point of the sloping construction line.



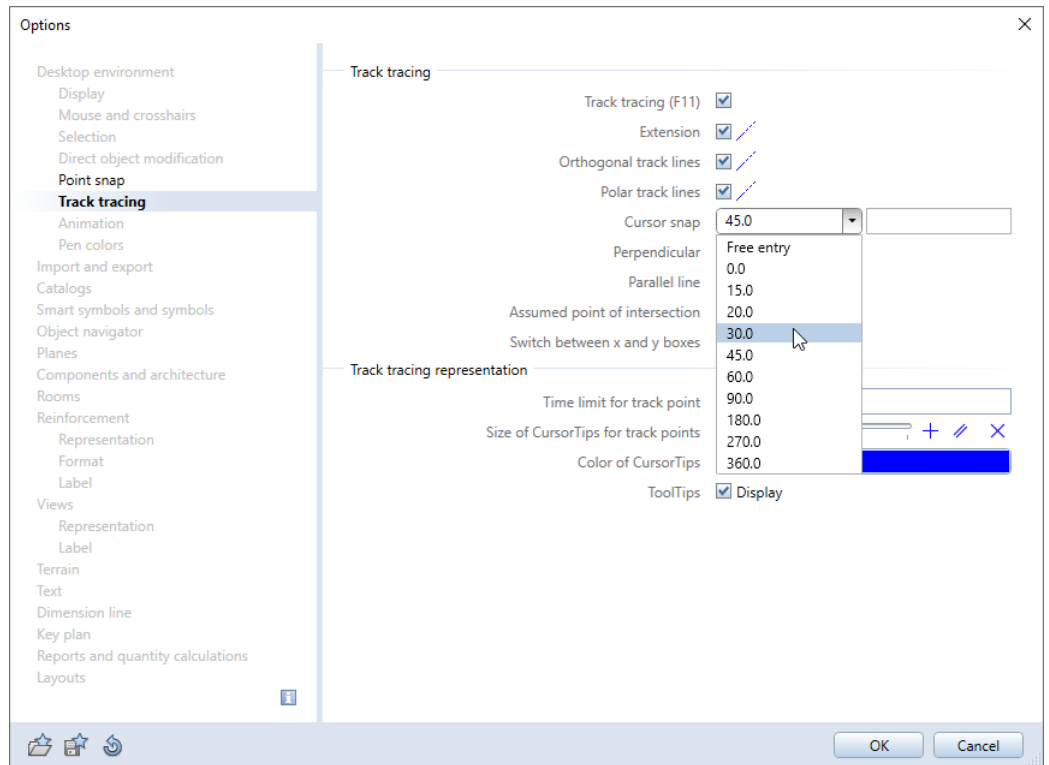
A = Start point

B = End point

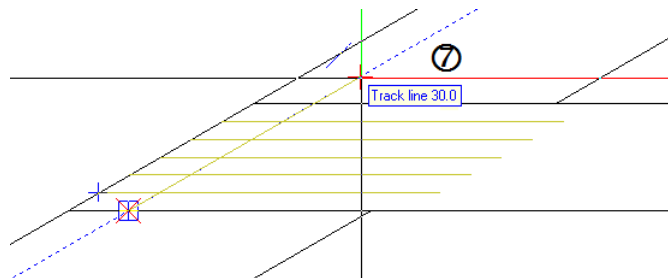
- 4 The construction line needs to be parallel to the rafter. Open the shortcut menu by right-clicking and select  **Track tracing options**.





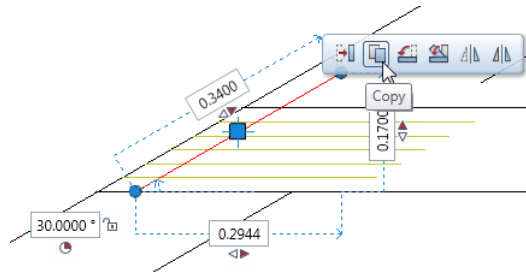
- 5 The **Options** dialog box opens. Set the **Cursor snap** angle to **30°**.




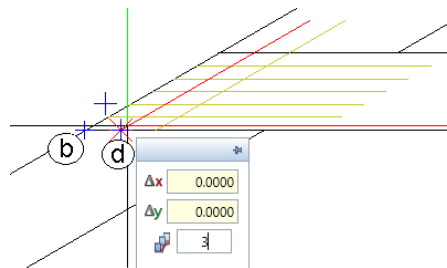
- 6 Click **OK** to close the **Options** dialog box.
- 7 Move the crosshairs along the **30.0**-degree track line. Use the mouse to specify the length of the construction line. The exact length is not important. However, make sure that the line projects beyond the horizontal line at the top.





- 8 Press ESC to quit the  **Line** tool.
- 9 Create three copies of the construction line and place them to the right:
 - a) Click the construction line and select the  **Copy** tool on the context toolbar.



- b) *From point or enter offset:* Click the point where the outer edge of the rafter and the bottom edge of the collar beam intersect (see below).
- c) *To point or enter offset:* Enter the  **Number** of copies in the coordinate dialog box: **3**
- d) Click the point where the outer edge of the rafter and the sloping construction line intersect (see below).




Now you have created the temporary grid which helps you place the nails.




- 10 Press ESC to quit the  **Copy** tool.
- 11 To switch construction line mode off again, clear the  **Construction Line** check box in the **Properties** palette.

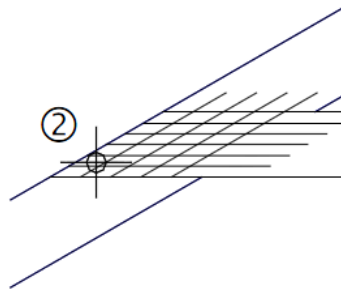
Nails

You will place the nails based on the temporary grid consisting of construction lines. First draw a nail as a circle. Then copy this circle to the points where the construction lines intersect. Finally, mirror and copy the complete design onto the opposite side.

Tip: Before placing the copies of the circle, check that you have activated the **Point of intersection** option in the **Point snap** area of the  **Point snap options** (shortcut menu). All-plan does not emit an acoustic signal when you place the copies of the circle.

To place nails

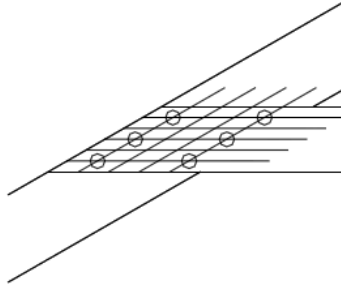
- 1 To draw a nail as a circle, click  **Circle (2D Objects task area)**. The **Circle** dialog box opens. Select  **Circle based on center** and  **Enter full circle**.
- 2 To define the center of the circle, click the point where the horizontal construction line at the bottom and the vertical construction line on the left intersect.
- 3 Enter the radius in the dialog line: **0.01**



- 4 To create the other nails, click  **Copy** on the shortcut menu of the circle.

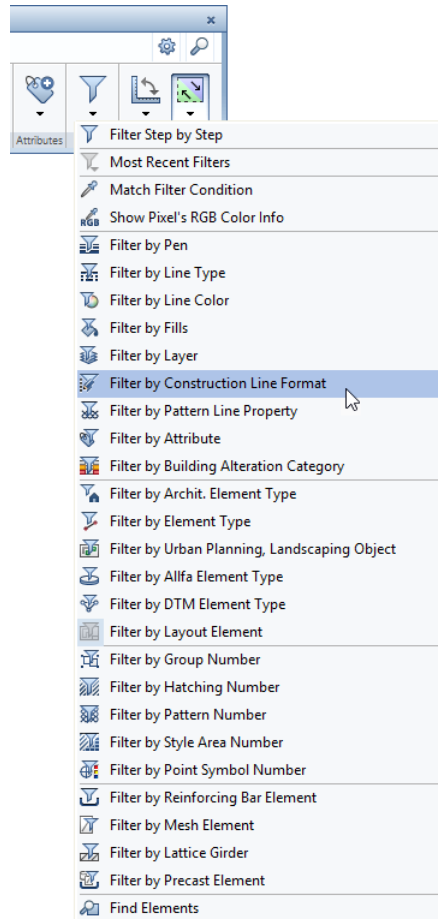
From point: Select the center of the circle as the reference point.

To point: Copy the circle to the points where the construction lines intersect (as shown below).

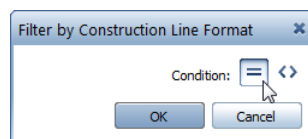


- 5 Delete the temporary grid consisting of construction lines so that you can see better. To do this, you will use an element filter. Right-click in the workspace and select **Delete** on the shortcut menu.

- 6 Point to the icon in the **Filter** task area and left-click within the blue part near the bottom of the icon. Click **Filter by Construction Line Format** in the dropdown list.



- 7 Select the condition (=) in the dialog box and click **OK** to confirm.

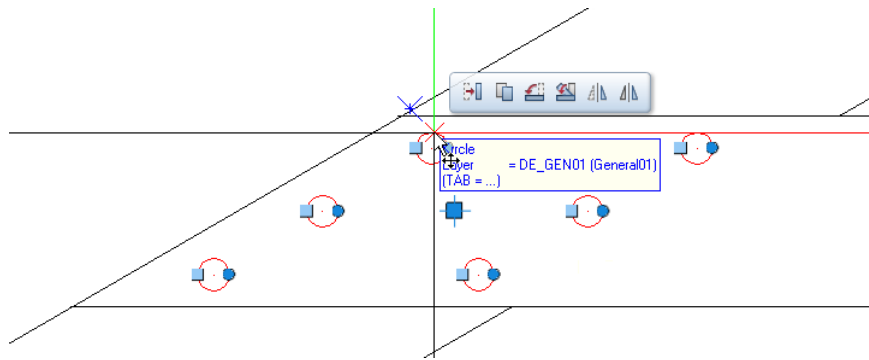


- 8 Enclose the temporary grid in a selection rectangle you open using the left mouse button.
As you have applied a filter, only the construction lines are deleted (and not the nails).
- 9 Press ESC to quit the **X Delete** tool.

To finish, you will mirror the nails onto the rafter on the right.

To mirror the nails

- 1 Enclose all nails in a selection rectangle you open using the left mouse button.
- 2 Point to a circle.
Make sure that you do *not point to a handle*!

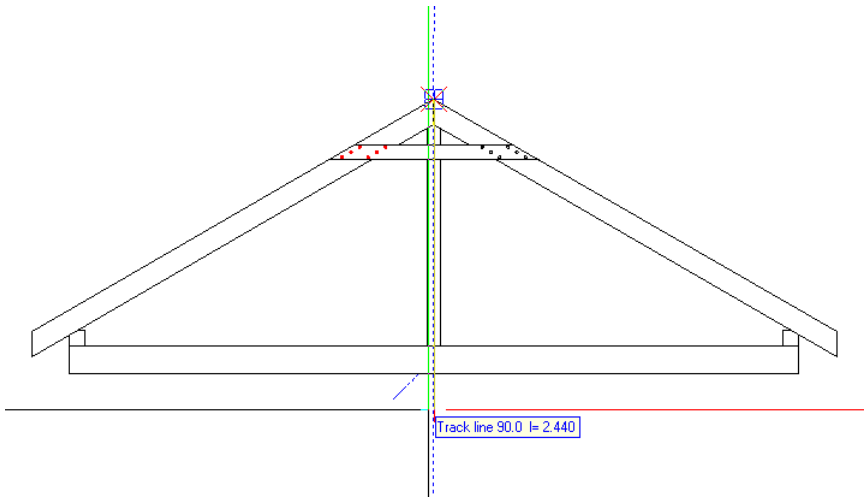


- 3 Click **Copy and Mirror** on the context toolbar.

- 4 To obtain a mirror axis that is exactly vertical:

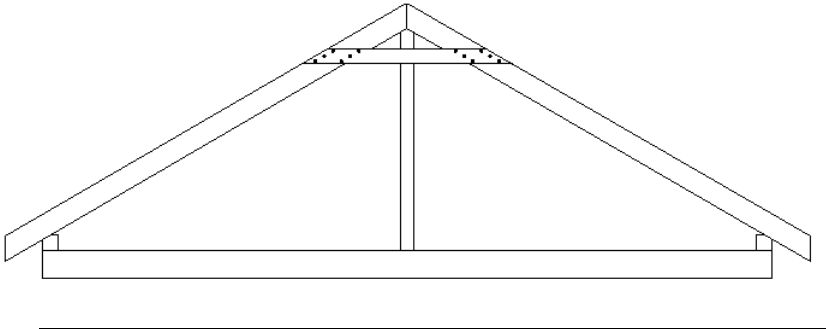
- a) Click the gable peak.
- b) Move the crosshairs vertically downwards so that the 90.0-degree track line appears.
- c) Left-click in the workspace below the design.

Tip: Instead of defining the vertical mirror axis using the 90.0-degree track line, you can click the vertical line between the rafters.



5 Press ESC to finish.

The design should now look like this:



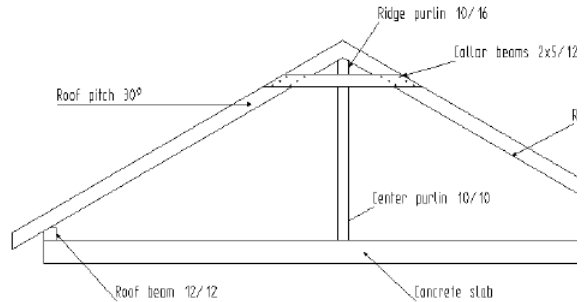
Task 2: labeling the purlin roof

Next, you will label the purlin roof.

Tools:

Objective:

A Horizontal Text



Labeling


To label the purlin roof

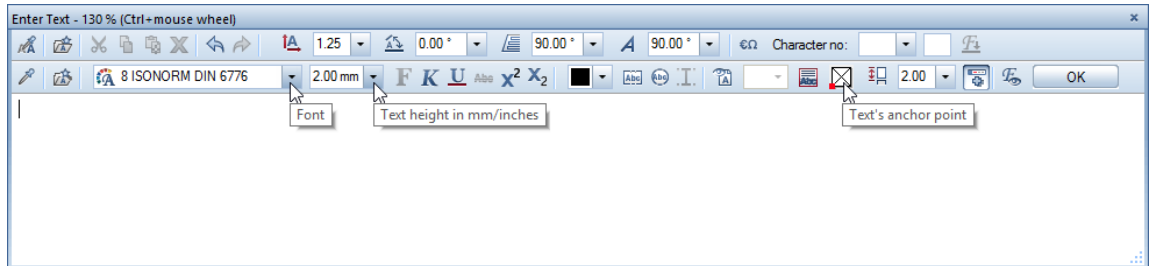
- 1 Maximize the **Quick Access** task area on the **Actionbar**.
- 2 Click **A** **Horizontal Text** (**Quick Access** task area) and specify where the text is to start by clicking in the workspace (see below). You can enter text and set parameters for it in the dialog box which appears.



See also: You can find detailed information on entering and editing text in the help for Allplan.

- 3 You do not need the track tracing feature to create labels. Switch off track tracing by pressing the F11 key.
- 4 Set the text height to **2.0** mm: Click in the **Text height** box and enter **2.0**. The text width changes dynamically with the aspect ratio set.

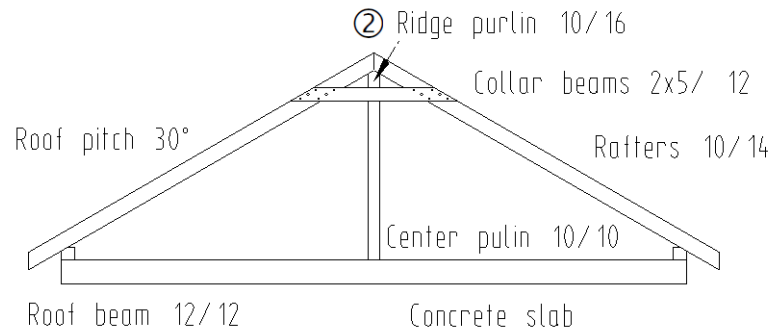
- 5 Click **Font** and select front number **8 ISONORM DIN 6776** in the dropdown list.
- 6 To specify where the text is to start, set the  **Text's anchor point** to bottom left.



Tip: To place text, you can also press CTRL+ENTER instead of clicking **OK**.

Tip: You can change the drop-in point by clicking anywhere in the workspace until you place the text.

- 7 Type **Ridge purlin 10/16** for the text and click **OK** to confirm. The text is placed in the workspace. The **A Horizontal Text** tool is still active.



- 8 Click in the workspace to specify where the next line of text is to start and label the drawing as shown at the beginning of this exercise.
- 9 When you have entered all the labels, press ESC to quit the **A Horizontal Text** tool.

Creating leaders



Leaders connect text with design entities. Leaders are always placed at a defined offset to the text. Allplan creates them as lines using the pen you have currently selected. You can apply symbols to the start and end of the line.

A leader always starts at a defined point of the text. Every text has eight points from which the leader can originate:

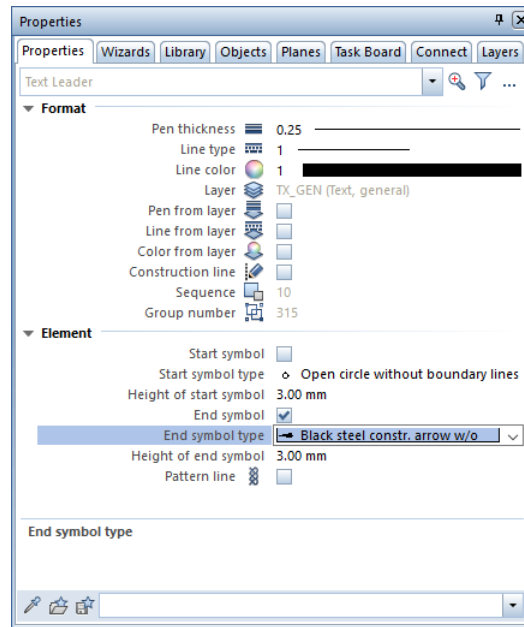


When you move text, the leader "sticks" to the starting point you have defined.


To create leaders

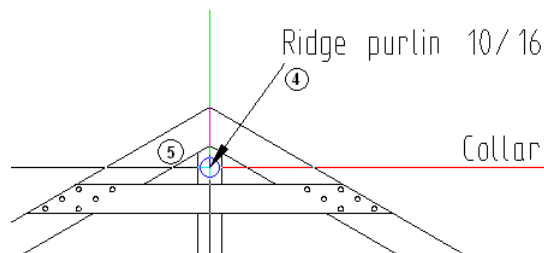
- 1 Click  **Text Leader** in the **Quick Access** task area.
- 2 Click  **Individual lines** on the **Text leader** Context toolbar.
- 3 Select the **End symbol** option in the **Properties** palette and choose **Black steel construction arrow without boundaries** in the dropdown list.


- 4 The **Symbol height** is set to **3.00 mm**. Leave this setting as it is.

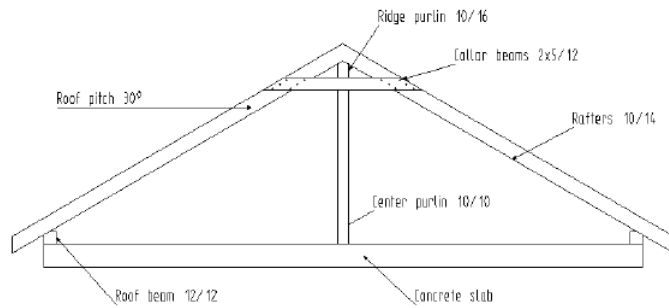



- 5 *Leader to text:* Click the text to which you want to attach a leader. Make sure that you click the point where you want the leader to start (at bottom left). The text is displayed in the selection color.
- 6 *To point:* Click where the leader is to end.

Tip: If you have accidentally created a leader in the wrong position, you can easily correct this: Click  **Back** on the **Text leader** Context toolbar and place the leader again.



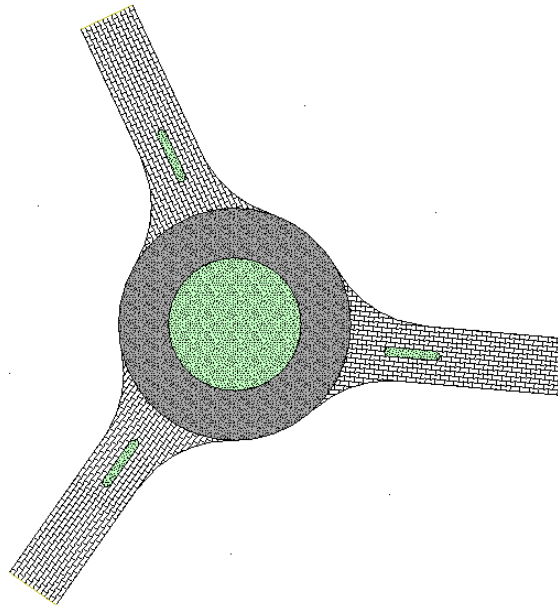
The  **Leader** tool is still active. To add a leader to the next line of text, repeat steps 4 and 5. Create more leaders as shown below.



7 Press ESC to quit the  **Leader** tool.

Exercise 4: Rotary with Three Roads

In this exercise, you will design a rotary with three roads leading up to it.






You will use the tools in the **2D Objects**, **2D Areas** and **Change** task areas.

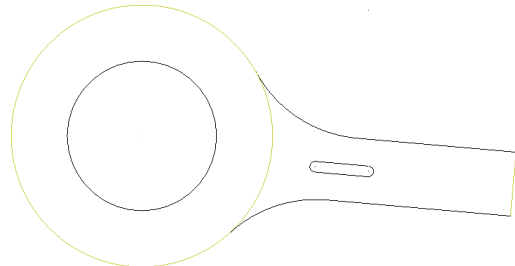
Task 1: designing a rotary with one road

In the first part of this exercise you will design a rotary with one road leading up to it. There is a traffic island in the middle of the road. You will start by drawing a rough outline consisting of a circle, lines and parallel lines. You will learn about the **Circle** and **Fillet** tools. The final outline will be created using the **Fillet** tool

Tools:

-  Circle
-  Parallel to Element
-  Polar coordinates
-  Auto-Delete Segment
-  Fillet






Objective:



Rotary with one road

In the first part of this exercise you will design the rotary and one of the three roads leading up to it.

To draw the rotary




- 1 Click  **Open on a Project-Specific Basis** and open an empty drawing file. Name it **Rotary** and close all the other drawing files.
- 2 Click  **Circle** in the **2D Objects** task area.
- 3 The **Circle** Context toolbar opens. Click  **Circle based on center** and  **Enter full circle**.
- 4 Click in the workspace to define the center of the circle.
- 5 To specify the **Radius**, enter **12.25 m** in the dialog line.
- 6 Press ENTER to confirm.
- 7 Switch to the  **Parallel to Element** tool.

- 8 Click the circle.
- 9 Enter **5.25** m for the **Offset** and press ENTER to confirm.
- 10 Click within the circle to specify the side on which the parallel line is to be created.
- 11 Enter **1** for the **Number** and press ENTER to confirm.

This will result in a lane width of 5.25 m in the rotary.

Next, draw the first road as a line. As the road is to be created at a given angle, you will use **polar coordinates**.

To design the first road

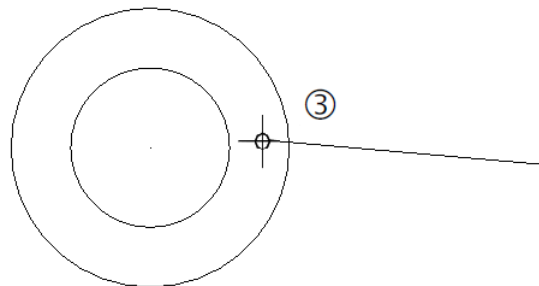
- 1 To draw the top edge of the road opening, click  **Line (2D Objects)** task area).
- 2 Click  **Individual lines** on the **Line** Context toolbar.
- 3 Click within the rotary to specify where you want the line to start (as shown below).
- 4 To draw the road at a given angle, click  **Polar coordinates** in the dialog line.



<Line> To point:

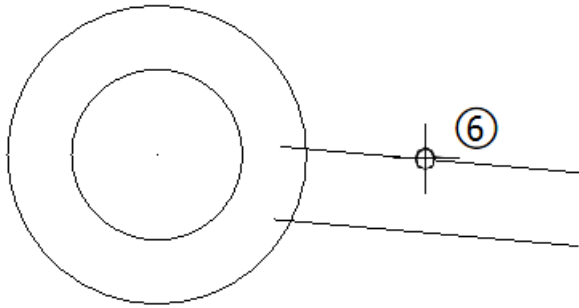
The angle between the opening and the path is 5° . Positive angles are measured counter-clockwise. Enter **355**.

Press the TAB key and enter **25** for the *length*.


Press ENTER to confirm.

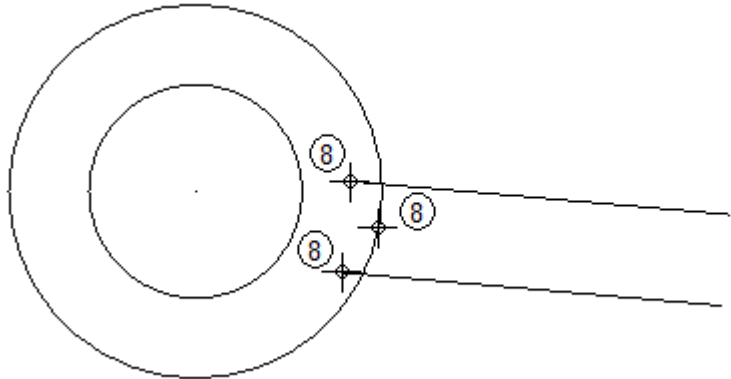


- 5 To draw the bottom edge of the road opening, click  **Parallel to Element** in the **2D Objects** task area. The  **Line** tool closes automatically.
- 6 Click the line you just created. Enter the following values in the dialog line:
Offset: **6.00**
Which side? Click below the line.
Number: **1**



- 7 You can now delete the redundant line segments protruding into the rotary.
Right-click a line you want to delete.

- 8 Choose  **Auto-Delete Segment** on the shortcut menu and click the line segments you want to delete.
Allplan deletes the lines as far as the point where they intersect the rotary.





- 9 Press ESC to quit the  **Auto-Delete Segment** tool.

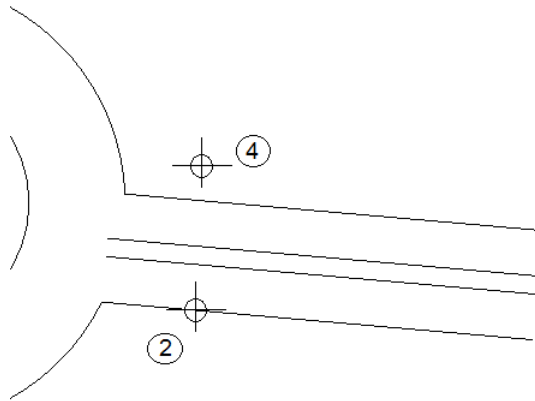
Traffic island for road





Next, you will design the traffic island, which consists of lines parallel to the road you just created. You will then use lines to connect the parallel lines.

To design the traffic island

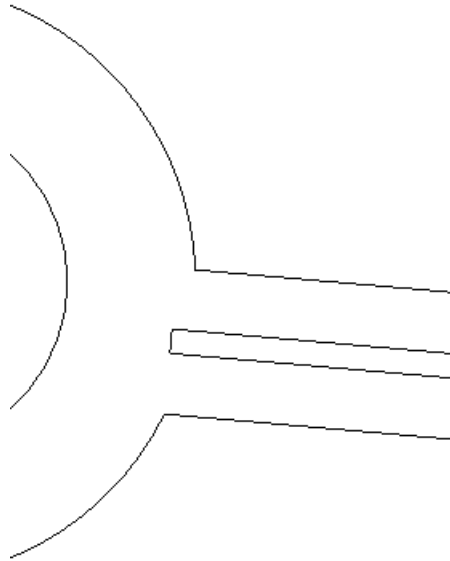
- 1 Click  **Parallel to Element (2D Objects** task area).
- 2 Click the bottom line of the road to use it as the reference element for the traffic island (see illustration below).
- 3 To create the bottom edge of the traffic island, enter **2.50** for the offset.
- 4 Click above the reference element to indicate the side and enter the *Number* in the dialog line: **1**.
This creates the first parallel line; the  **Parallel to Element** tool is still active.

- The system prompts you to enter an offset in the dialog line. The value you enter is based on the parallel line you just created. Enter the offset between the bottom and top of the traffic island:
1.00





- Click  **Line** in the **2D Objects** task area. The  **Parallel to Element** tool closes automatically.
Make sure  **Individual lines** is selected on the **Line** Context toolbar.
- Choose  **Delta Point** in the dialog line.

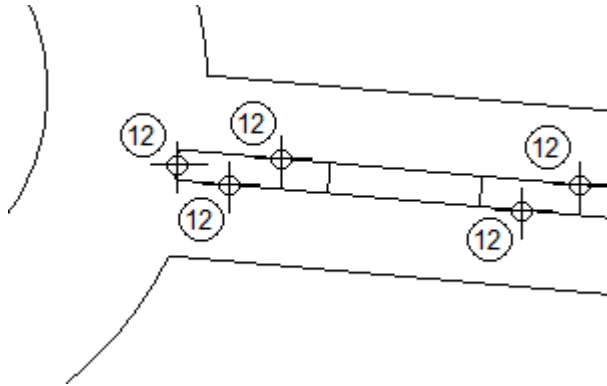
- 8 Join the end points of the two parallel lines (see below) and press ESC to quit the tool.




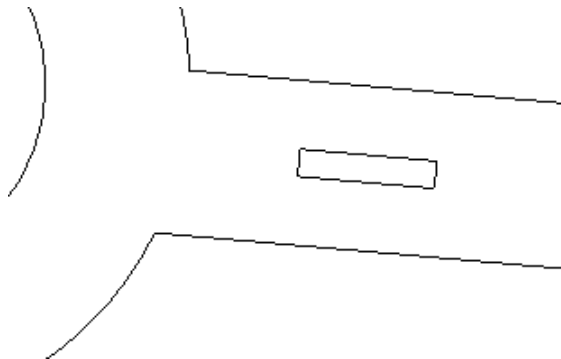
You will use this line as the reference line.

- 9 To design the missing sides of the traffic island, click  **Parallel to Element** in the **2D Objects** task area.
- 10 Click the line you just created to use it as the reference element. The system prompts you to make entries in the dialog line. Enter the following values:
 - *Offset:* **5.00**; *Which side?* **To the right**; *Number:* **2**
 - Press ESC to quit the tool.
- 11 Right-click a line of which you want to delete redundant segments.

- 12 Choose  **Auto-Delete Segment** on the shortcut menu and click the line segments you want to delete (see below).





- 13 Press ESC to quit the  **Auto-Delete Segment** tool. The result should look like this:

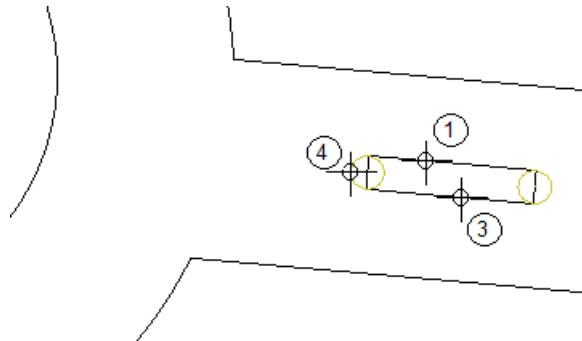



Filleting the road and traffic island

In the next exercise, you will create the final outline of the road and the traffic island. To do this, you will use the **Fillet** tool, which allows you to apply a fillet to corners and to join lines, which do not touch, with arcs. After you have clicked the two elements, Allplan will present auxiliary circles for you to choose from.

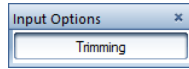
To fillet the road and the traffic island

- 1 Use the  **Fillet** tool to fillet the traffic island.
To open this tool, point to the top line of the traffic island.
- 2 Open the shortcut menu and click  **Fillet**. This selects the first element.
- 3 Click the bottom line of the traffic island.
The fillet radius is set to **0.5**. Press ENTER to confirm it.
Two auxiliary circles appear on screen.
- 4 Click the circle you want to use for the fillet.



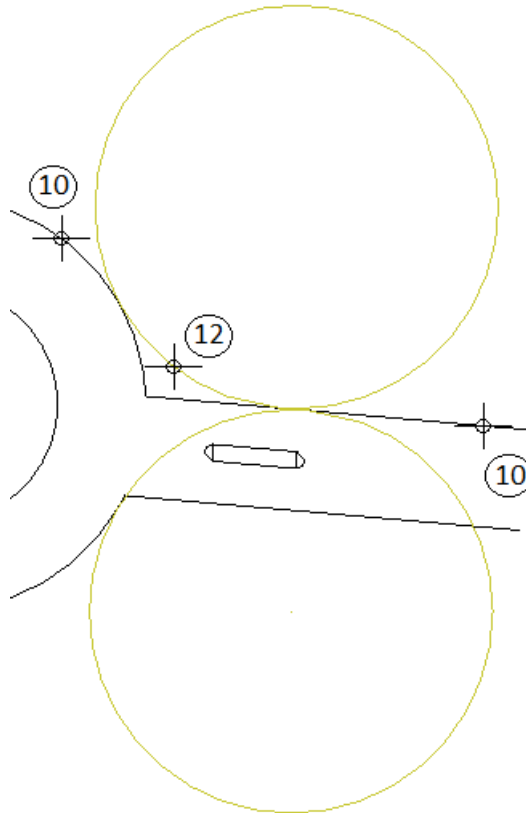
- 5 To fillet the opposite side of the traffic island, click the top and bottom lines again.
- 6 Here, too, the fillet radius is set to **0.5**. Press ENTER to confirm it.
- 7 Click the second circle to use it for the fillet.
- 8 If you can't see the result, click F8 to refresh the screen contents.
- 9 The  **Fillet** tool is still open. **Trimming** is displayed in the input options. When this button is active (default setting), Allplan au-


tomatically shortens or lengthens the initial lines as far as filleting starts. If trimming isn't active, click to activate it now.

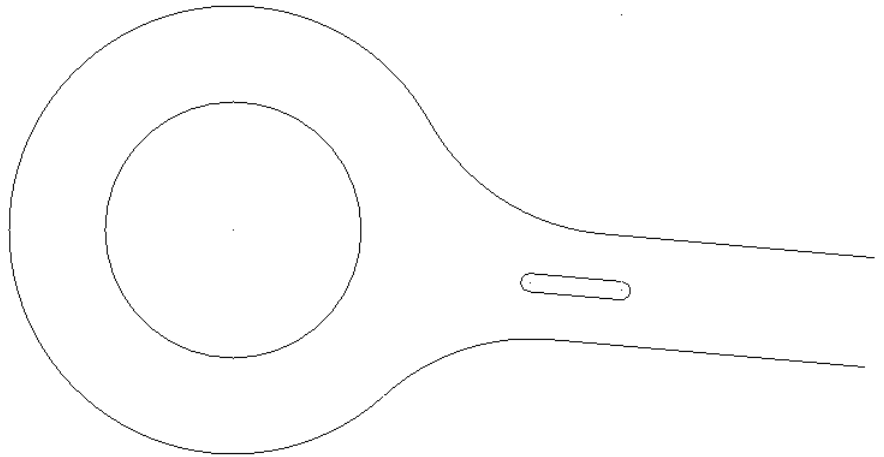


The traffic island is created. Next, you will apply a fillet to the road leading up to the rotary.

- 10 Click the top edge of the road and the adjoining outer arc to create the fillet at the top (see below).
- 11 Enter the radius: **12.00**
- 12 Click the circle you want to use for the fillet.



- 13 Click the bottom edge of the road and the adjoining outer arc to create the fillet at the bottom (see below). Repeat steps 7 and 8.
- 14 If you want, you can delete redundant segments using  **Auto-Delete Segment** (shortcut menu). The following should now be displayed on your screen:





- 15 Press ESC to quit the  **Auto-Delete Segment** tool.

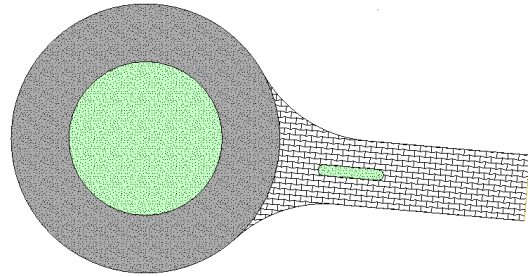
Task 2: pattern

In this task, you will apply a pattern to the road leading up to the rotary. You will learn about the **Pattern** and **Pattern definition** tools.

Tools:

-  Pattern
-  Pattern definition
-  Area detection
-  Island detection
-  Select Pattern
-  Pattern Width
-  Pattern Height
-  Modify Format Properties
-  Convert Surface Element


Objective:

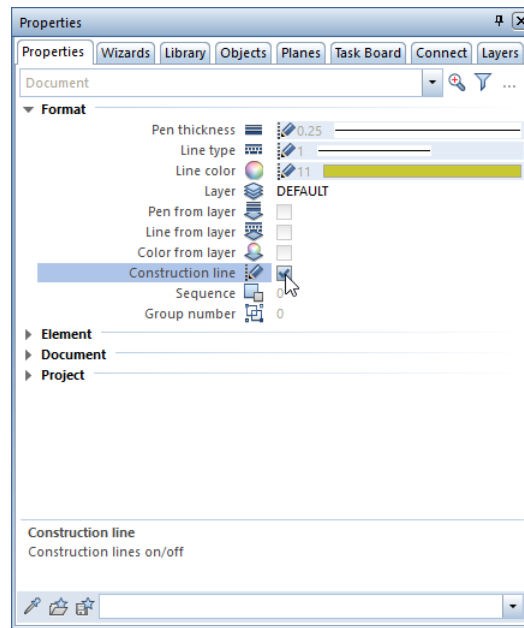



Creating closed outlines


The first step involves creating closed outlines. This is necessary if you want to use **area detection** to apply patterns to the rotary and the road afterwards.







To create a closed outline for the road

- 1 To do this, you will use construction lines.
Select the  **Construction Line** check box in the **Properties** palette.

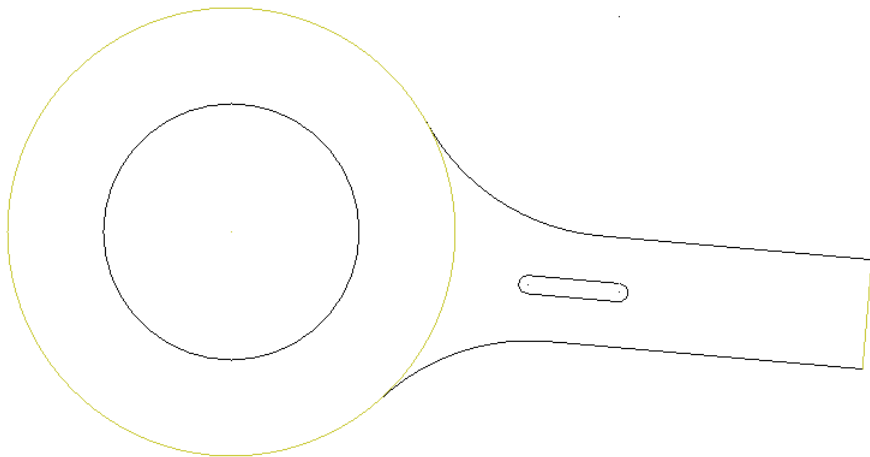


Note: Construction lines are like erasable pencil lines on conventional drawings. When you select construction line mode, Allplan draws all elements using the construction line color and line type set in the  **Options - Desktop environment - Display** page - **Drawing file and NDW window** area. Elements drawn as construction lines are excluded from printouts.

- 2 Click  **Circle** (2D Objects task area).

- 3 The **Circle** Context toolbar opens. Click  **Circle based on center** and  **Enter full circle**.
- 4 Click the existing center of the inner circle.
- 5 To specify the **Radius**, enter **12.25** m in the dialog line.
- 6 Press ENTER to confirm.
- 7 Switch to the  **Line** tool (**2D Objects** task area) to join the right-hand ends of the two lines representing the boundaries of the road. The  **Circle** tool closes automatically. Make sure  **Individual lines** is selected on the **Line** Context toolbar.
- 8 Choose  **Delta Point** in the dialog line.
- 9 Join the end points of the two parallel lines (see below) and press ESC to quit the tool.
- 10 Switch construction line mode off again.



Your drawing should now look like this:

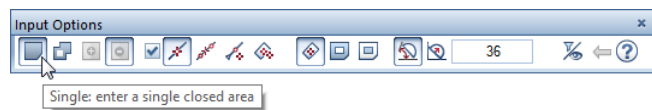


Applying a pattern to the road

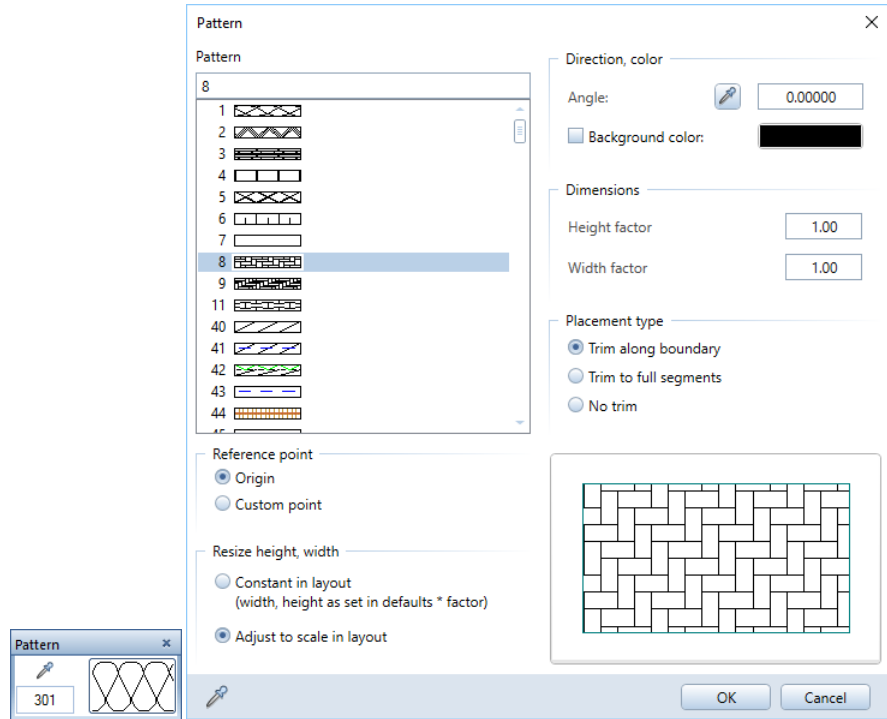
Next, you will apply a pattern to the road leading up to the rotary. You will use area detection to define the area which is to be given a pattern. The traffic island is to be left out.




To apply a pattern to the road

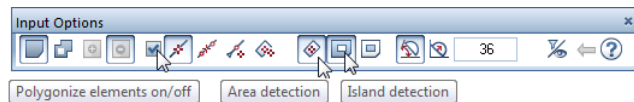
- 1 Click  **Hatching** (2D Areas task area).
- 2 Click  **Single** in the input options.



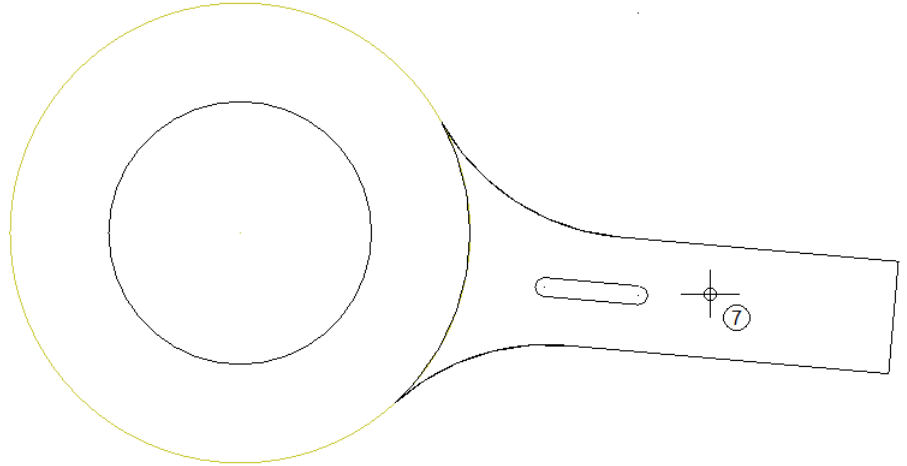
- 3 Go to the **Pattern** Context toolbar and click **Properties**.
- 4 Select pattern **8** and set the following parameters:
 - **Reference point** area:
Origin
 - **Resize height, width** area:
Adjust to scale in layout
 - **Dimensions** area:
Height factor and width factor: 1.00
 - **Placement type** area:
Trim along boundary



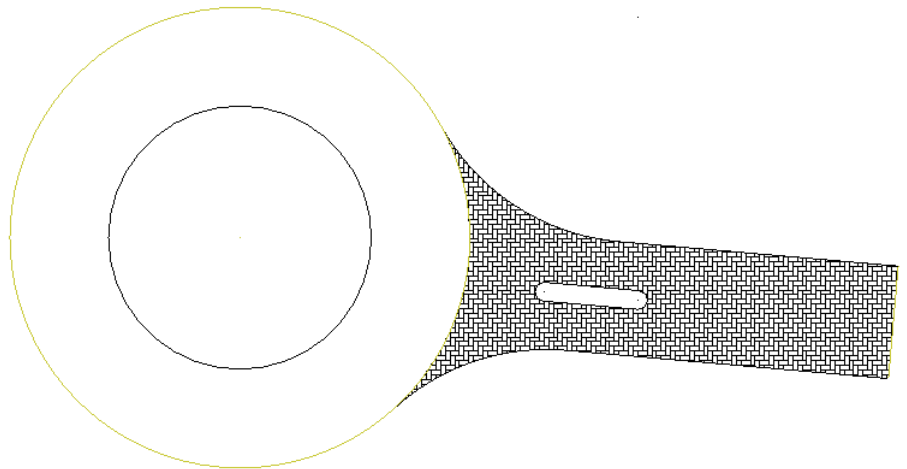
- 5 Check that the **Polygonize element** check box is selected in the input options.
- 6 Select  **Area detection** and  **Island detection** in the input options.
 **Island detection** detects closed outlines within an area and cuts them out automatically.




- 7 Left-click within the closed outline of the road.
Make sure that you do not click within the part you want to cut out.



Allplan detects the outline of the road as a closed area, cutting out the traffic island automatically. You should hear an acoustic signal.



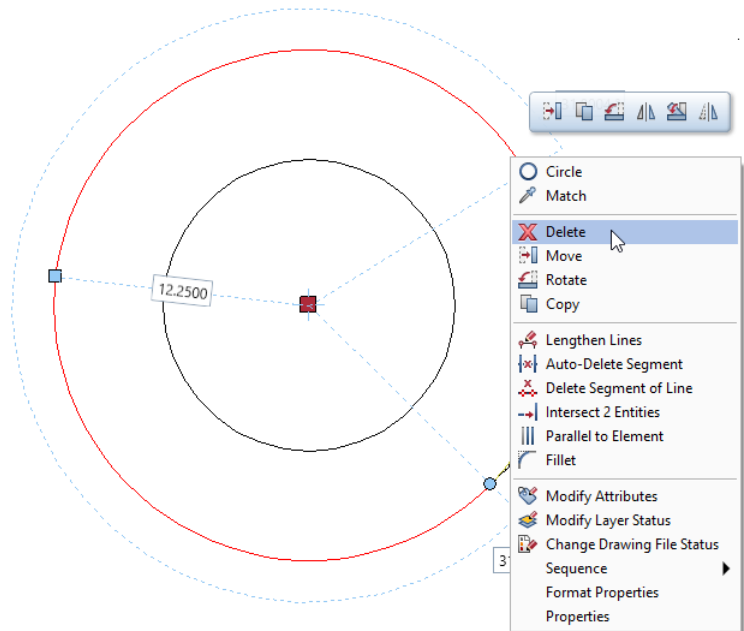
- 8 Press ESC to quit the  Pattern tool.

Applying a pattern to the rotary

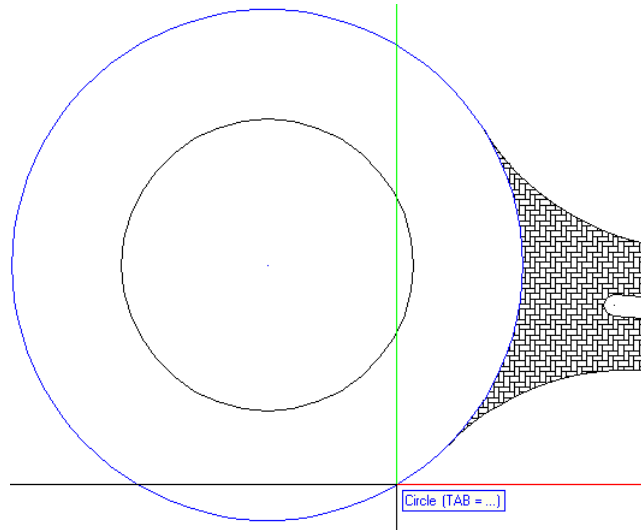
The next step is to apply two different patterns to the rotary. The procedure is basically the same as the one described in the previous step.


To apply a pattern to the rotary

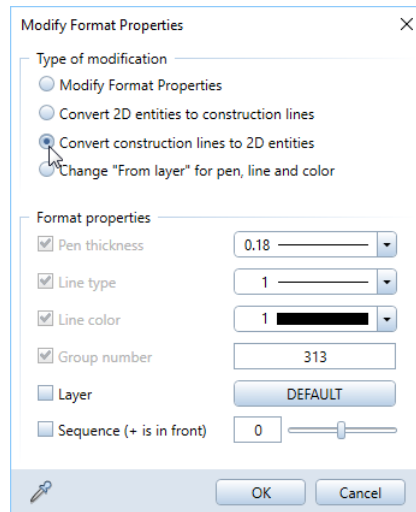
- 1 Before you apply patterns to the areas, delete the arc that is directly under the circle you created as a construction line. To do this, left-click the arc.
- 2 Left-click to open the shortcut menu and select **Delete**.





- 3 Point to the outer circle of the rotary. Make sure that you do not select the part of the circle that belongs to the road. The arc is displayed in the selection preview color.



- 4 Click it.
- 5 Convert the circle you created as a construction line to a design entity.
Select the  **Modify Format Properties** tool in the **Change** task area.
- 6 Select **Convert construction lines to 2D entities** and click **OK**.

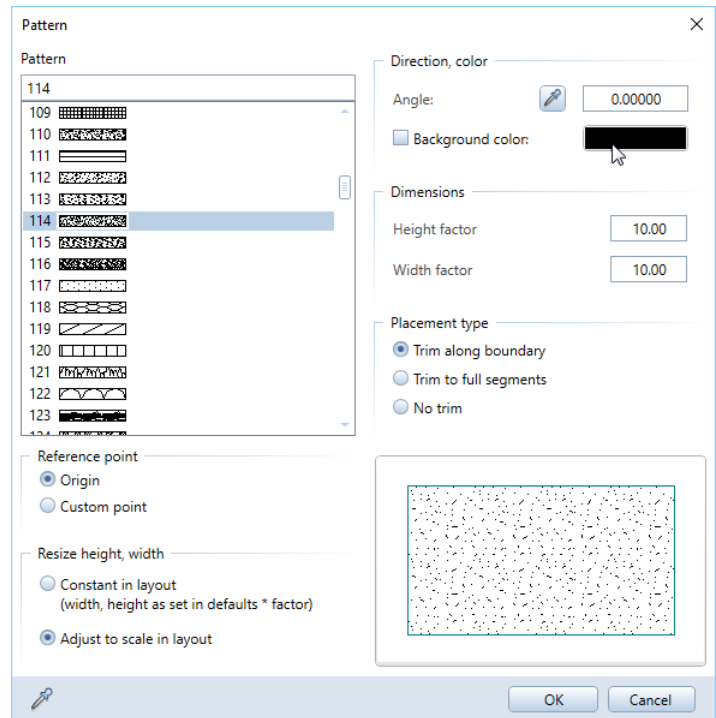


- 7 Press ESC to finish.
- 8 Click  **Hatching** (2D Areas task area).
- 9 Click  **Single** in the input options.

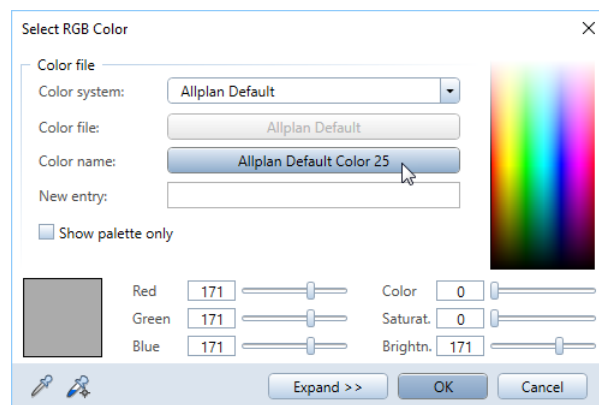




- 10 Go to the **Pattern** Context toolbar and click **Properties**.
- 11 Select pattern **114**, enter **10** for the **Height factor** and the **Width factor** and set the following parameters:
 - **Reference point area:**
Origin
 - **Resize height, width area:**
Adjust to scale in layout
 - **Placement type area:**
Trim along boundary

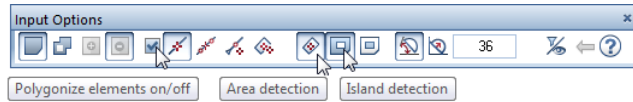
- 12 The pattern is to have a background color.
Select the **Background color** option and click in the box to select a color.




- 13 Click the **Color name** button and select **Default Allplan Color 25**.



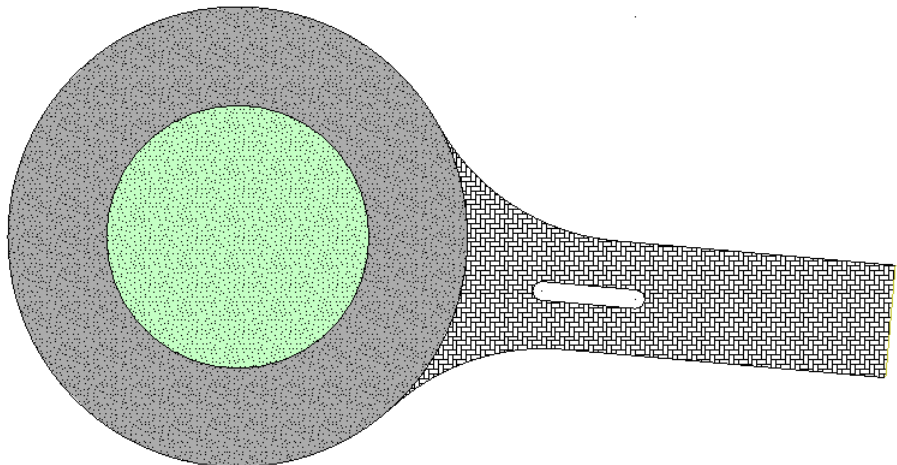
- 14 Close the **Select RGB Color** and **Pattern** dialog boxes by clicking **OK**.
- 15 Check the input options to see if the **Polygonize elements on/off** check box is selected and  **Area detection** and  **Island detection** are switched on.



- 16 Left-click the outer circle.
- 17 Press ESC again to quit the  **Pattern** tool.

Apply pattern **105** to the inner circle yourself. Enter **10** for the **Height factor** and the **Width factor**. Select **Allplan Default Color 78** for the background color.





The result should look like this:



Applying a pattern to the traffic island

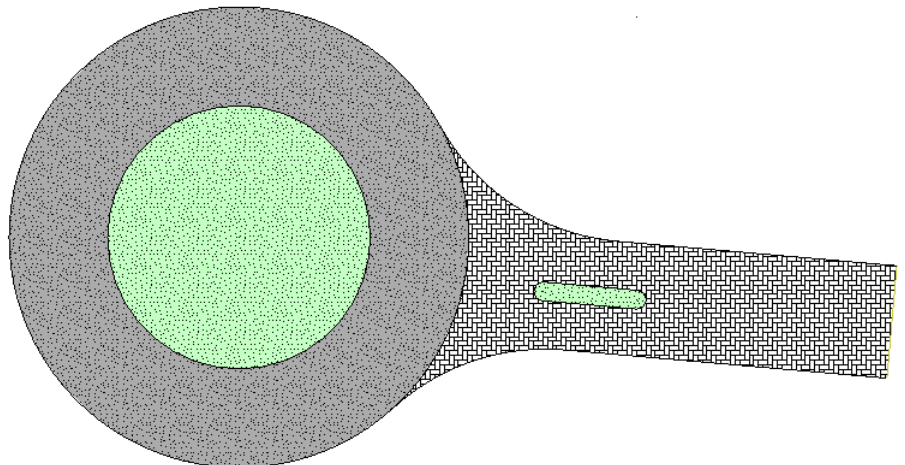
Finally, you will apply a pattern to the traffic island of the road. You will use the same pattern as for the inner circle of the rotary.

To apply a pattern to the traffic island

- 1 Click  **Hatching** (2D Areas task area).
- 2 To match a pattern you have already applied, click  **Match parameters** on the **Pattern** Context toolbar.
- 3 Click the pattern in the inner circle of the rotary.
- 4 Click  **Single** in the input options.
- 5 Check that  **Area detection** is selected in the input options.
- 6 Zoom in on the area around the traffic island.
- 7 Click within the traffic island.

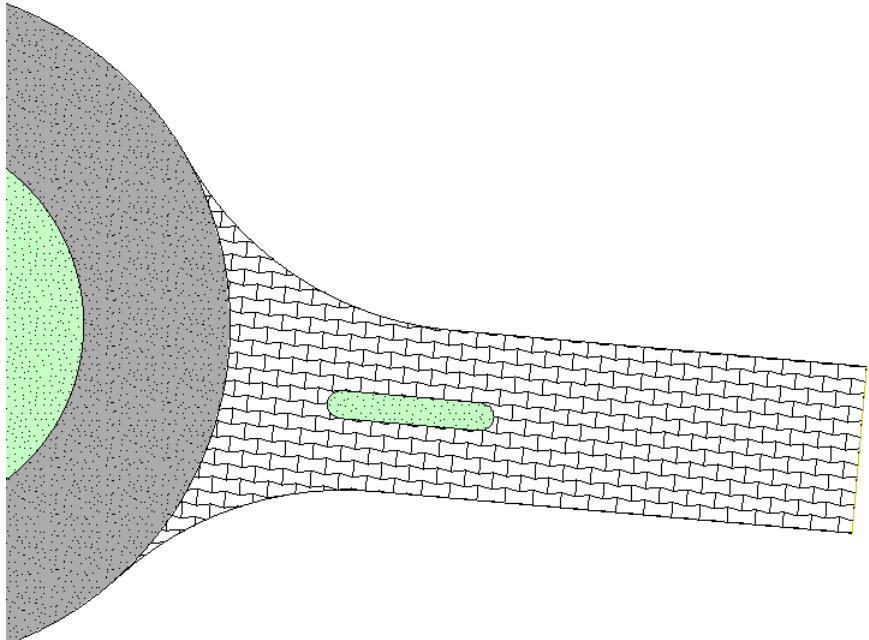
The pattern is applied to the traffic island.

The result should now look like this:




Defining a new pattern

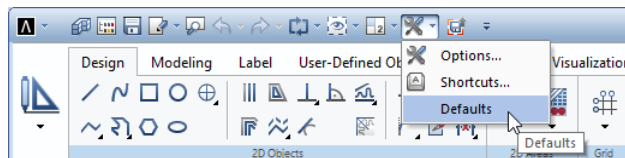
Allplan 2020 comes with various ready-made patterns (depending on the configuration). You can also modify existing patterns and define new ones. In the following exercise, you will learn how to define a new pattern and apply it to the road.



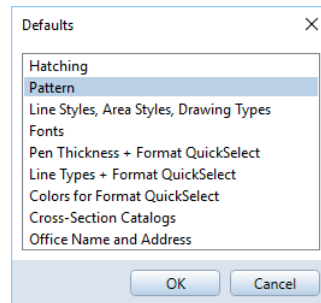
Please read the notes on defining hatching styles. They also apply to patterns.

To define a new pattern

- 1 Open the  **Default Settings** dropdown list on the Quick Access Toolbar and select **Defaults**.




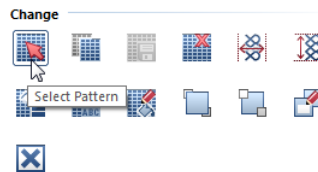
- 2 Click **Pattern** on the context toolbar.



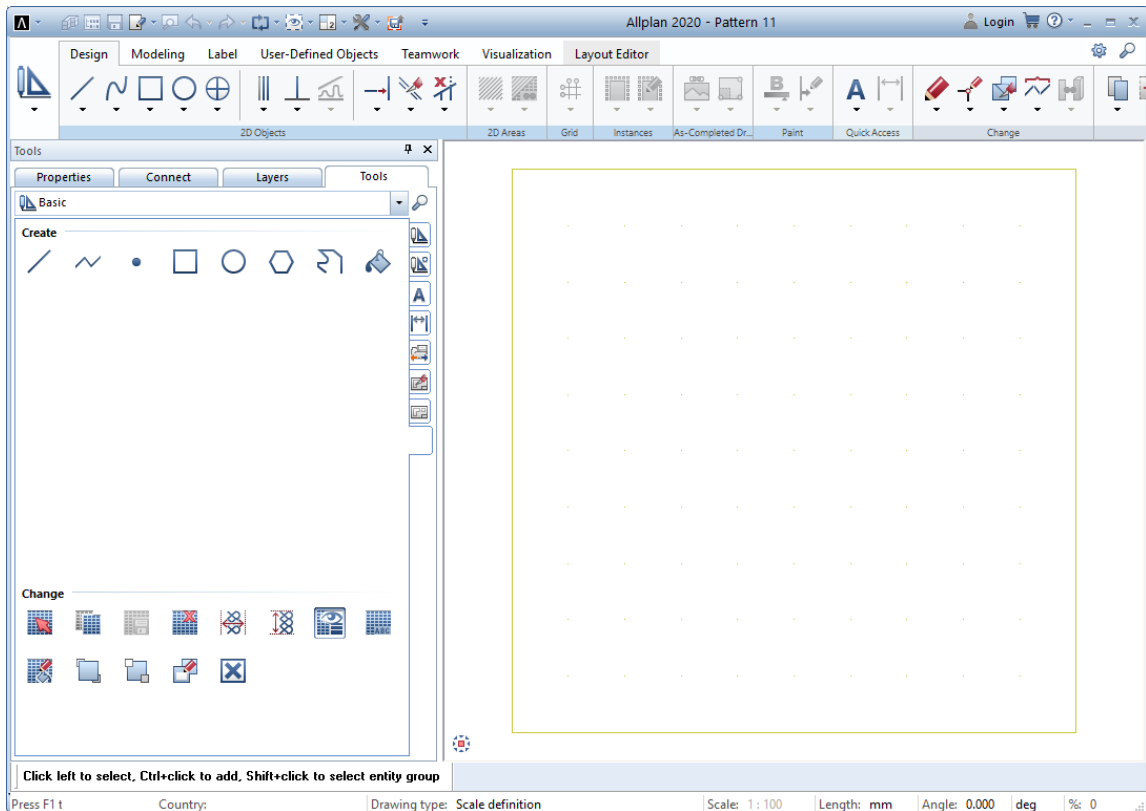
Tip: The patterns that are already defined depend on the configuration you purchased. Patterns 10 and higher are usually free. When you select a free pattern, only the editing frame and the temporary crosses are displayed on screen.



Begin by selecting an unassigned pattern.



- 3 To create your own patterns, you can use the **Tools** palette, which opens automatically. Go to the **Change** area and click  **Select Pattern**.

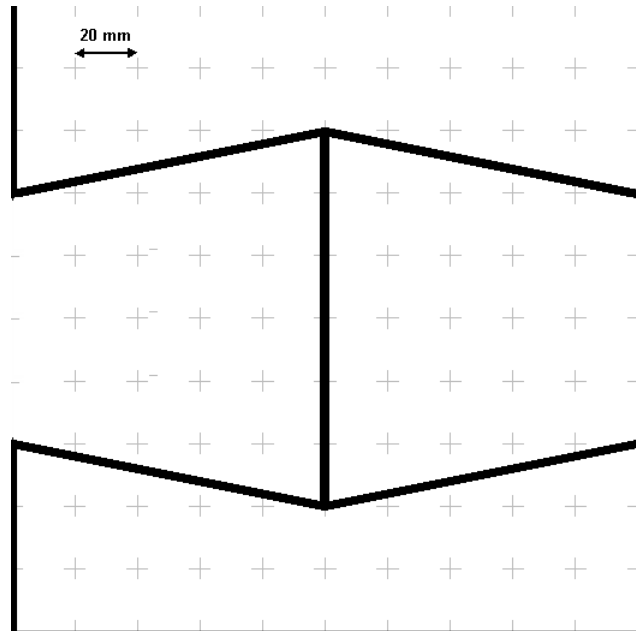



- 4 Select a free number (e.g. 11) in the **Select Pattern** dialog box. Allplan displays an editing frame on screen, making it easier for you to define patterns. The frame contains a grid of dots to help you draw the pattern.



- 5 Click  **Pattern Width** in the **Tools** palette (**Change** area) and enter the *width* of the pattern in mm in the dialog line: **200** Press ENTER to confirm.
- 6 Click  **Pattern Height** in the **Tools** palette (**Change** area) and enter the *height* of the pattern in mm in the dialog line: **200** Press ENTER to confirm.

- Click  **Line** in the **Tools** palette (**Create** area).
Click  **Polyline** on the **Line** Context toolbar.
Draw the pattern as shown below.




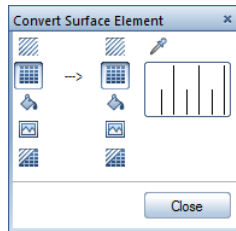
- Press ESC three times to quit the  **Line** tool and to finish defining the pattern.
 - Click **Yes** when you see the **Would you like to save the pattern definition?** prompt.
The **Tools** palette closes automatically.
-

Applying the new pattern

The pattern is defined. Next, you will apply the new pattern to the road. You need to make some settings in the **Pattern** dialog box to adjust the pattern to the road.

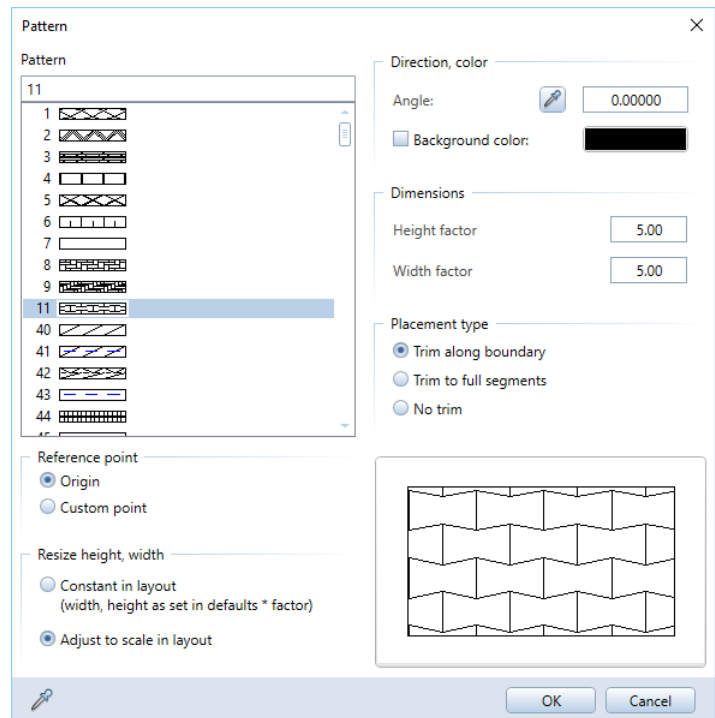
To apply the new pattern

- 1 Click  **Convert Surface Element** (2D Areas task area).
- 2 On the context toolbar, select **Modify, Convert Pattern to Pattern** and click **Properties**.




The **Pattern** dialog box opens.

- 3 Select pattern **11** and enter **5** for the **Width factor** and **Height factor** in the **Size** area and set the following parameters:
 - **Reference point area:**
Origin
 - **Resize height, width area:**
Adjust to scale in layout
 - **Placement type area:**
Trim along boundary



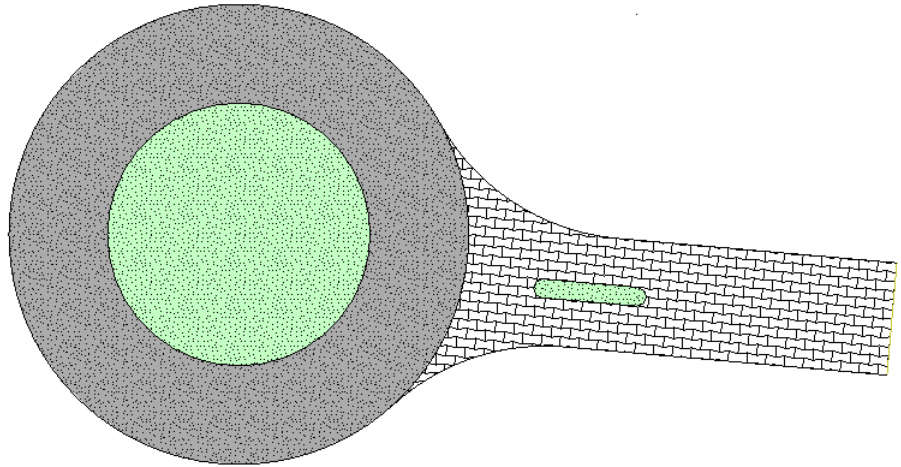
The pattern is to be placed at an angle of 5° . You can copy the angle directly from the drawing.

- 4 In the **Direction, color** area, click  beside **Angle**.
The dialog box closes; you are back in drafting mode.
- 5 Click the top line of the road.
The dialog box opens again and an angle of -5° is displayed.
- 6 Here, the pattern is to be generated from the point at bottom right; i.e. this is the reference point. Click **Custom point** in the **Reference point** area to define the reference point.
The dialog box closes temporarily.
- 7 Click the point at bottom right to define it as the reference point.
- 8 Click **OK** to confirm the settings.
- 9 Click the pattern to be modified. The pattern changes depending on the settings you have made.

Tip: Allplan generates the pattern from the reference point.

To define a new reference point, set the reference point to **Origin** and then to **Custom point**.

10 Press ESC to quit the tool.



Task 3: completing the design

In this task, you will add the two missing roads to the rotary. You will learn about the **Copy and Rotate** tool.

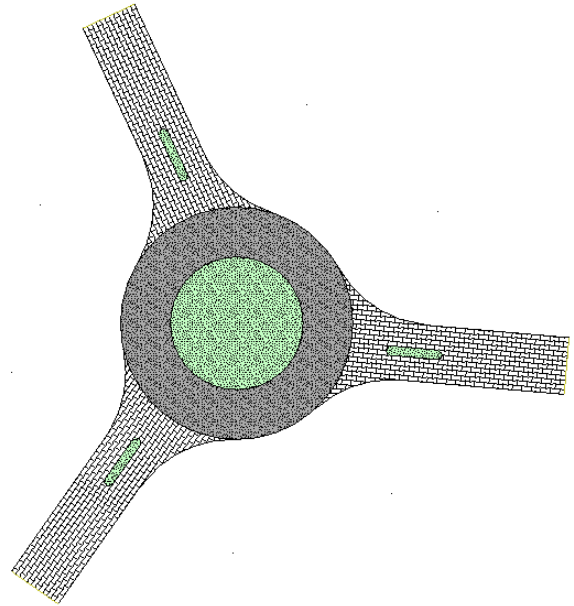
Tools:

Objective:



Copy and
Rotate

Pattern
Line




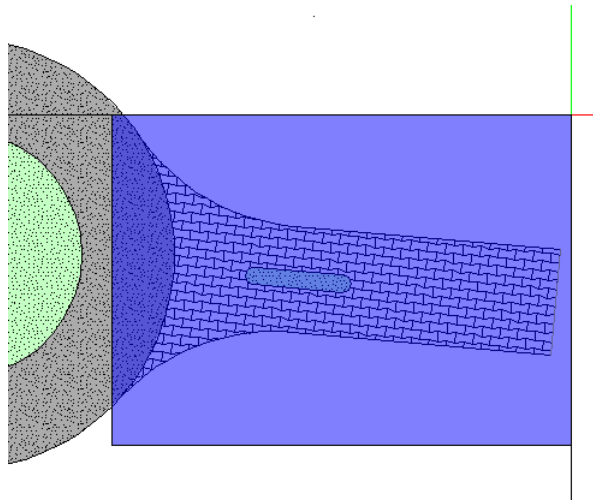
Creating the missing roads

You will complete the rotary, so that three roads lead up to it.

To add two more roads


- 1 Enclose the entire road in a selection rectangle you open from bottom left to top right (positive x-direction) using the left mouse button.

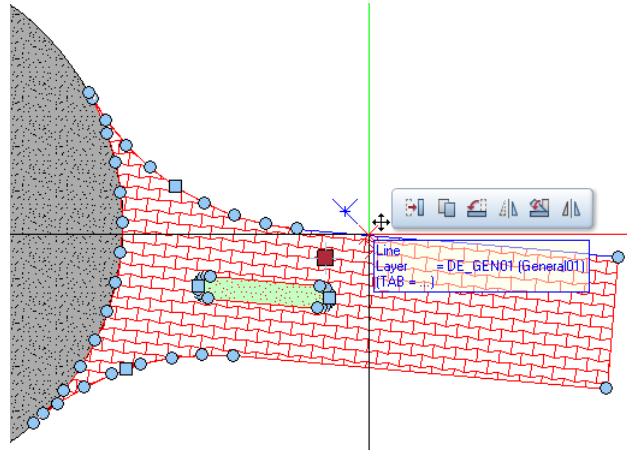
Tip: You can select elements by enclosing them in a selection rectangle. The default setting is  **Select Elements Based on Direction** (Actionbar - Work Environment task area): Opening the selection rectangle in the positive x-direction only selects the elements that are fully bounded by the selection rectangle; opening the selection rectangle in the negative x-direction selects all the elements that are fully or partially bounded by the selection rectangle.




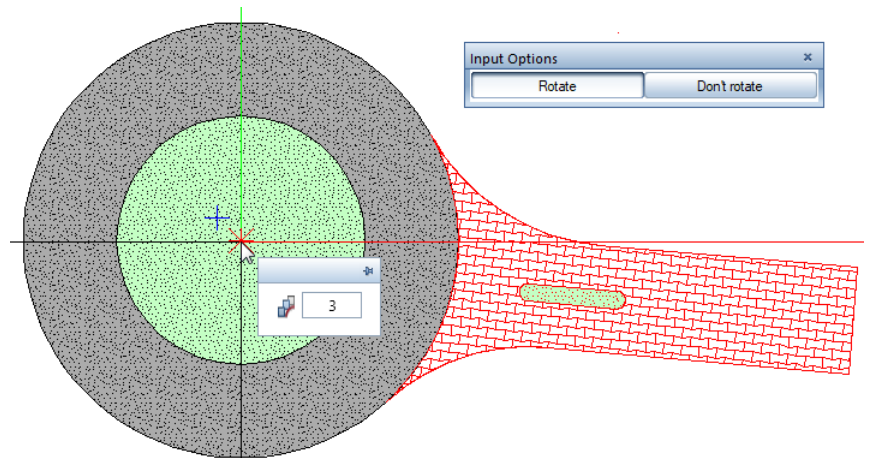
The road, pattern and traffic island are displayed in the selection color. In addition, handles appear.

- 2 Point to the upper boundary line of the road. Make sure that you do not point to a handle!

- 3 Click  **Copy and Rotate** on the context toolbar.

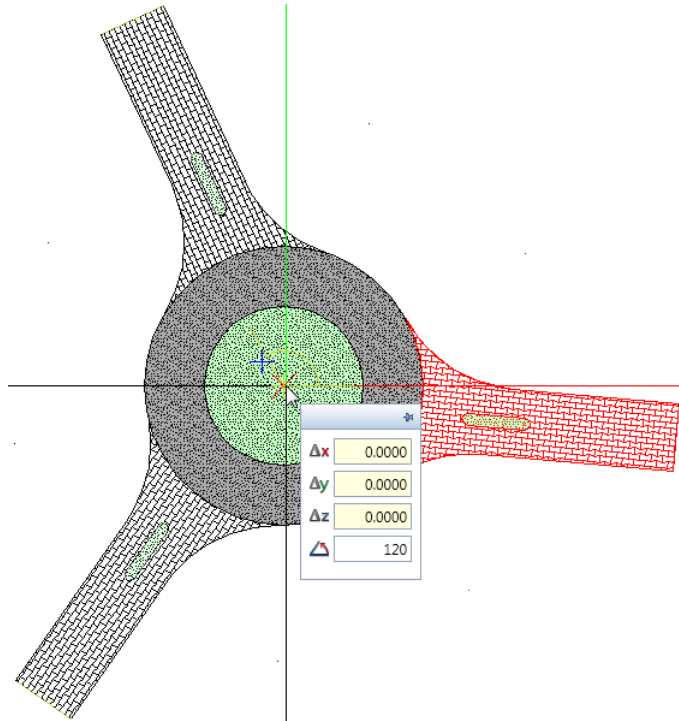


- 4 *Click base point of rotation*
Click the center of the rotary.
- 5 Select **Rotate** in the input options to rotate the elements at the same time.
- 6 *How many times?*
Enter  **3** in the coordinate dialog box and press ENTER to confirm.

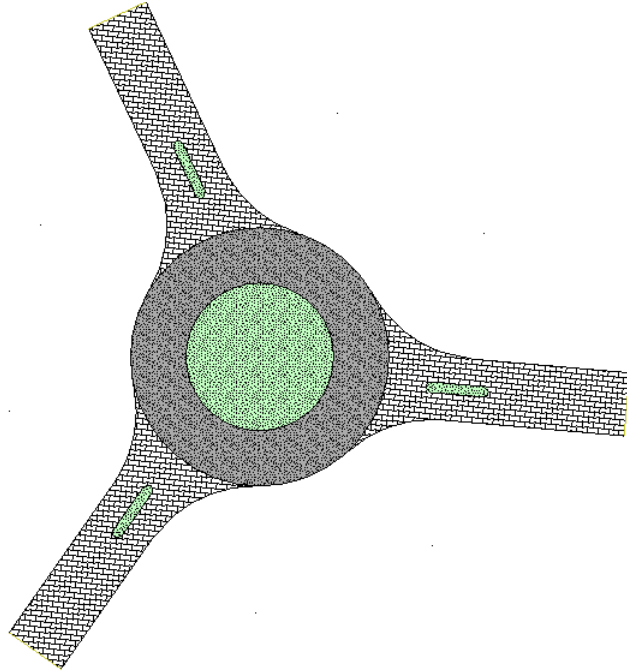


7 *Start point, reference line or rotation angle*

Enter **120°** for the angle of rotation in the coordinate dialog box and press ENTER to confirm.



8 Press ESC to quit the tool.



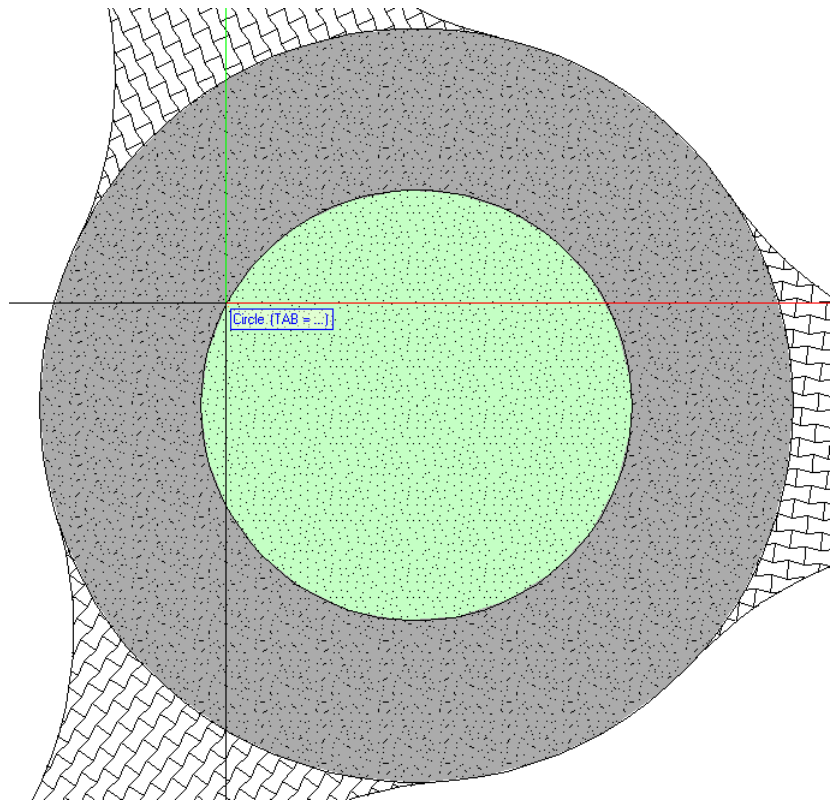
You can now adjust the pattern placed in the two new roads to the angle of the other road (compare the section "Applying the new pattern (on page 153)").

Pattern line

Finally, you will add a row of large paving stones to the edge of the inner circle of the rotary. To do this, you will use the **Pattern Line** tool.

To add a pattern line

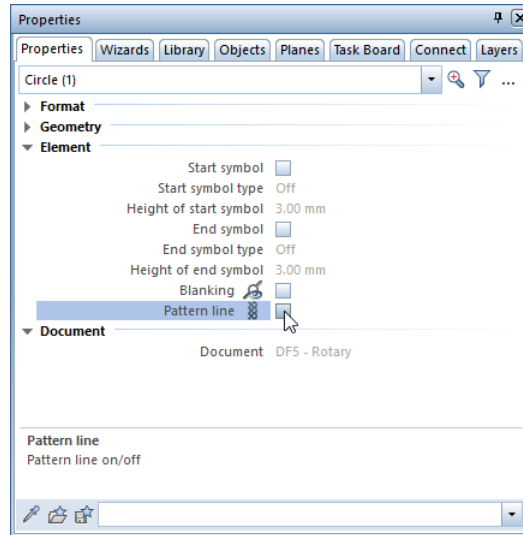
- 1 Zoom in on the inner circle of the rotary.
- 2 Point to the inner circle.
Pay attention to **element info**: Make sure **Circle** is displayed.



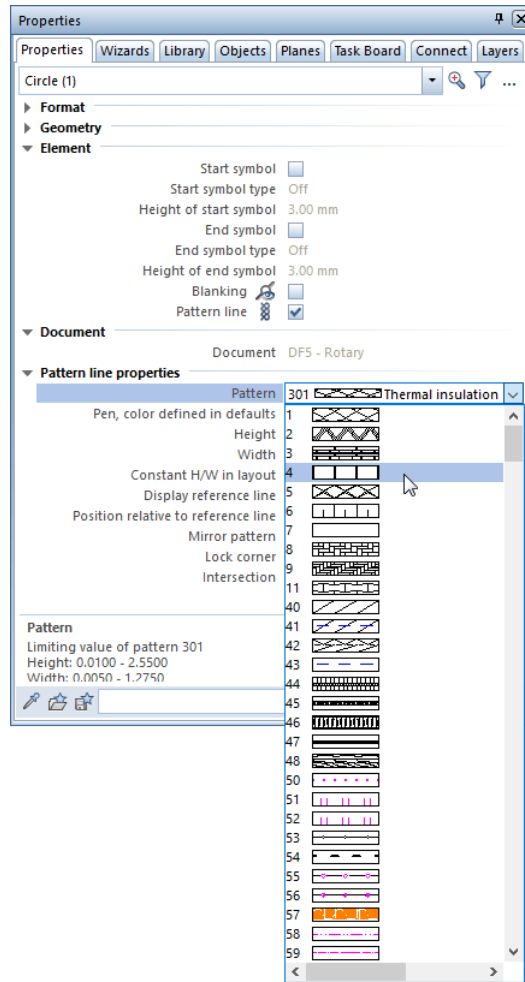
- 3 Double-click the inner circle with the left mouse button.

The circle is displayed in the selection color. The **Properties** palette opens. You can see the properties of the selected circle.

- 4 Select the **Pattern line** option in the **Properties** palette.

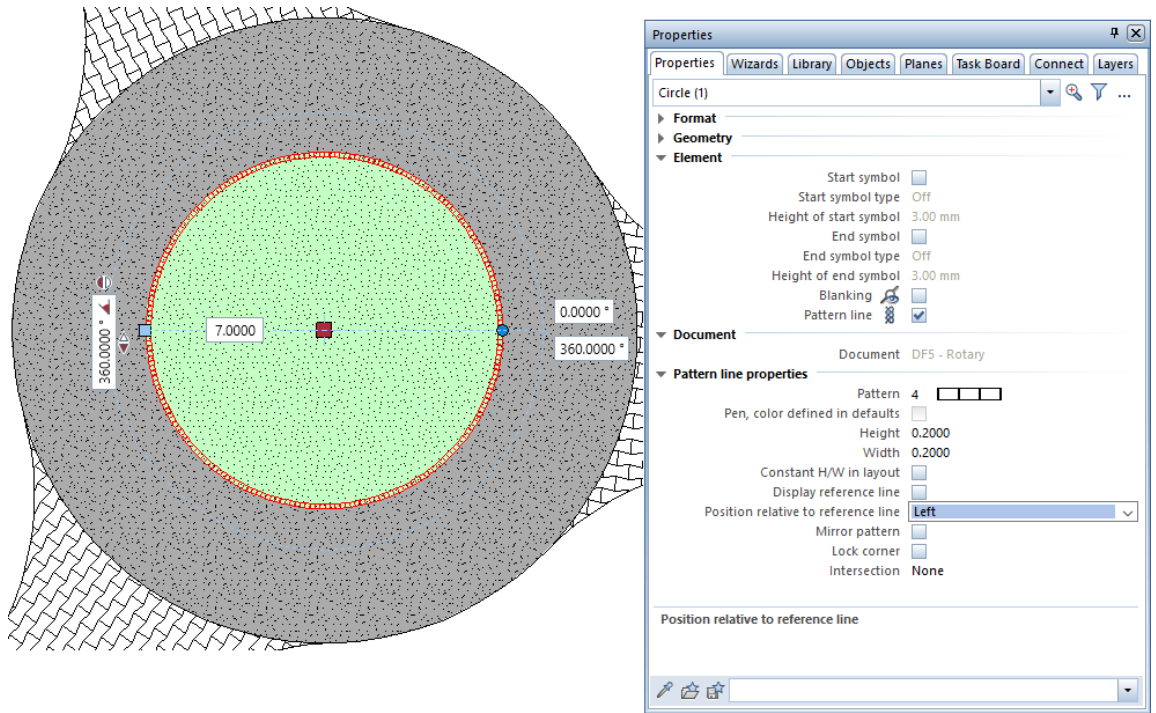


- 5 The pattern line properties are highlighted in yellow. Open the list of patterns and select pattern 4.



- 6 Adjust the **Height** and **Width** of the pattern. Select **0.20 m** for both values.

7 Position relative to reference line: left.



8 Press ESC.


Exercise 5: Title Block


In this exercise, you will create a title block and enter text for it.

Index	Type of Change	Date / Name
Contents		
Precast Balcony Unit, Type 12		
Project		
New Condominium With Underground Parking		
Client		Date
Client Street, Munich		XX.XX.20XX
		Drawn by: Name
Architect		Checked by: Name
Architects Street, Munich		Scale: 1:50/25
Engineer		Layout number:
Consulting Engineers Street, Munich		XXX

You will use the tools in the **2D Objects** and **Quick Access** task areas.

Note: In addition to the method described in this exercise, Allplan offers additional options for creating and labeling title blocks:







The  **Label** tool (**Layout Editor** task – **Layout Editor** task area) provides various title blocks. These title blocks, which are saved as label styles, transfer specific details and project attributes (date, project name, edited by and so on) straight from the system to the title block. The Architecture Tutorial (unit 8) includes an example showing how to create a title block as a label style.

In addition, you can use the  **Legend, Title Block** tool (**Layout Editor** task – **Layout Editor** task area). These legends always include the current layout attributes and project attributes. The program always creates the legends as associative legends, making sure any changes in the attributes update automatically. After having placed a legend, you can resolve it into its design entities.

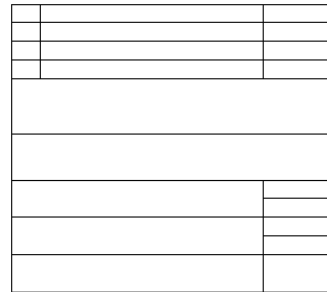
Task 1: designing the title block



In the first part of the following exercise, you will draw the layout of the title block using the tools in the **2D Objects** task area (**Design** task).

Tools:

-  Reference Scale
-  Rectangle
-  Parallel to Element
-  Auto-Delete Segment
-  Delete
-  Modify Format Properties

Objective:



Each task on the **Actionbar** has its own set of basic settings known as  **Options** ( **Default Settings** dropdown list on the Quick Access Toolbar). The options include defaults that affect the way the tools function.

Using these options, you can configure the program to suit your own preferences.

Setting the unit and reference scale



Start by specifying the unit of length for the values you enter. You will use **mm** for this exercise.

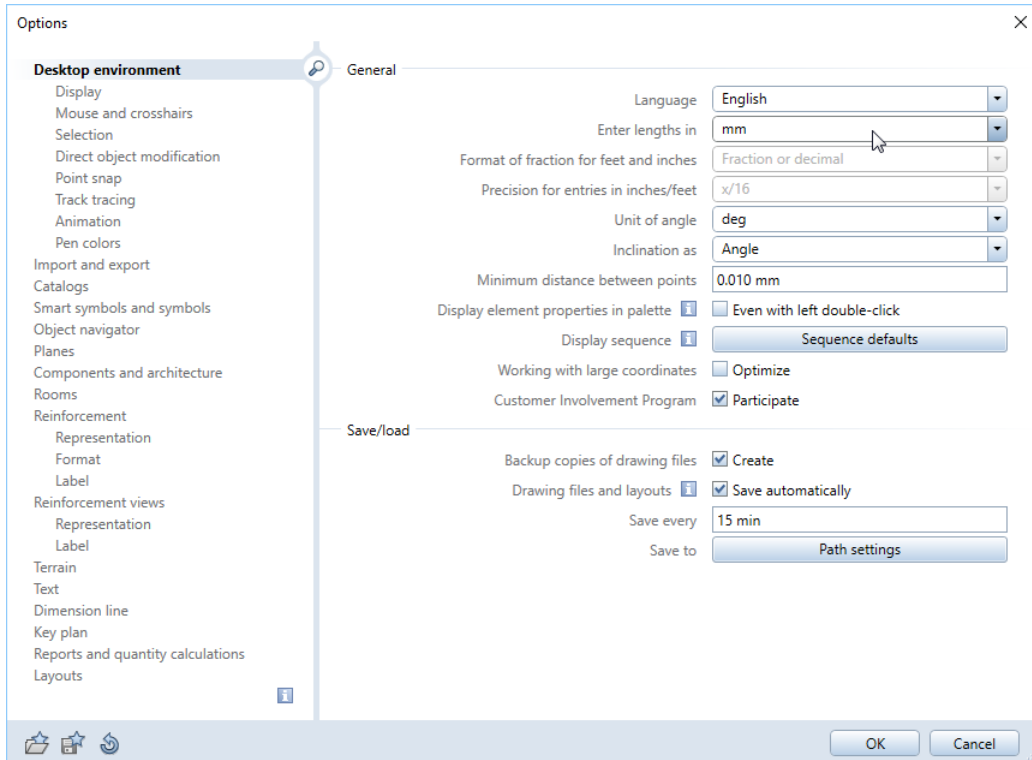
Before you do this, you are advised to select an empty drawing file to ensure that the new unit of length and reference scale only apply to the drawing file in which you are creating the title block.

To select a new drawing file

- Click  **Open on a Project-Specific Basis** and open an empty drawing file. Name it **Title block** and close all the other drawing files.

To set units

- 1 Open the  **Default Settings** dropdown list on the Quick Access Toolbar and click  **Options**. Select the **Desktop environment** page in the **Options** dialog box.
- 2 Set the **Enter lengths in** option to **mm**.



Tip: Alternatively, set the unit on the status bar: Click in the field beside length and select **mm** for this exercise.

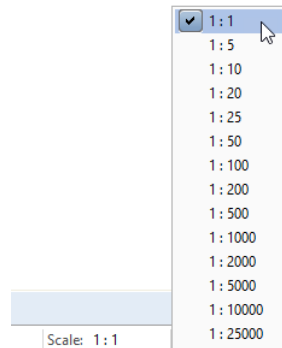
- 3 Click **OK** to confirm the settings.

Change the reference scale too. Until now you have worked at a scale of 1:100.

The title block will be drawn at a scale of 1:1.

To set the reference scale






- 1 Click in the field beside **Scale** on the status bar and select **1:1**.




Border of title block

Start by drawing the outer border of the title block.


To draw the outer border as a rectangle

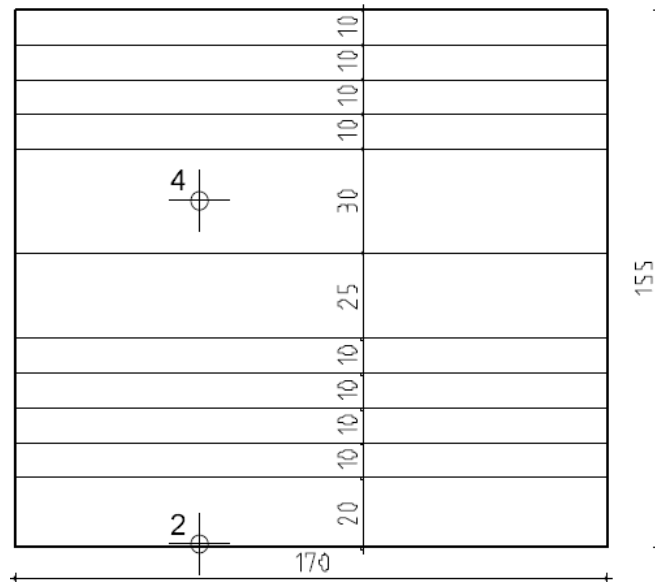
- Drawing file **Title block** is current; all the other drawing files are closed.
- 1 Click  **Rectangle** (2D Objects task area).
- 2 The **Rectangle** Context toolbar opens. Select  **Based on diagonal line**.
- 3 Place the first point in the workspace.
- 4 *Diagonal point*
Enter a length of  **170**. Press the TAB key and enter  **155** to define the width. Then press ENTER to confirm.
Allplan draws the rectangle.
- 5 Click  **Zoom All** in the border of the viewport.

Tip: Did you make an incorrect entry? Click  **Undo** (quick access toolbar). You can undo all steps back to the last save.


Create the inner lines as lines parallel to the border.

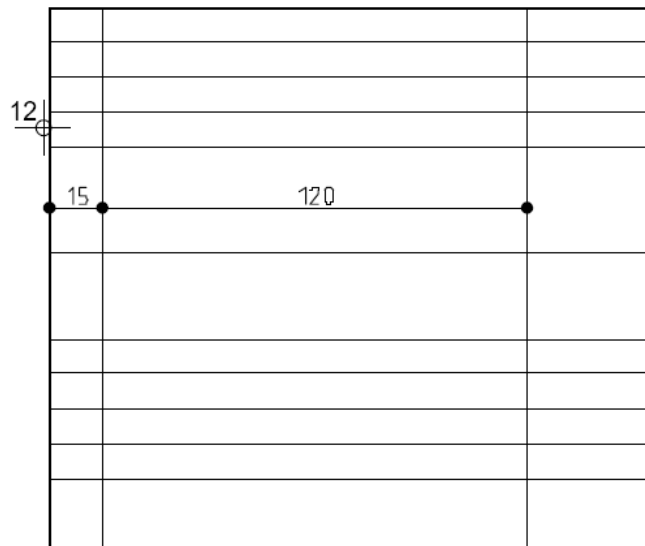
To draw the inner lines

- 1 Click  **Line** (2D Objects task area).



- 2 *Click element*
Click the bottom line of the border.
- 3 *Through point or offset*
Enter **20** for the offset and
Press ENTER to confirm.
- 4 *Which side?*
Click inside the rectangle.
- 5 *Number: 1*
- 6 *Point through which element is to pass or enter offset: 10*
Number: 4
- 7 *Point through which element is to pass or enter offset: 25*
Number: 1




- 8 *Point through which element is to pass or enter offset: 30*
Number: 1
- 9 *Point through which element is to pass or enter offset: 10*
Number: 3
- 10 Press ESC to quit the tool.
- 11 To draw the parallel lines that are vertical, click  **Parallel to Element** again.
- 12 Click the left-hand side and create two parallel lines - one at an offset of **15** and the other at an offset of **120**.

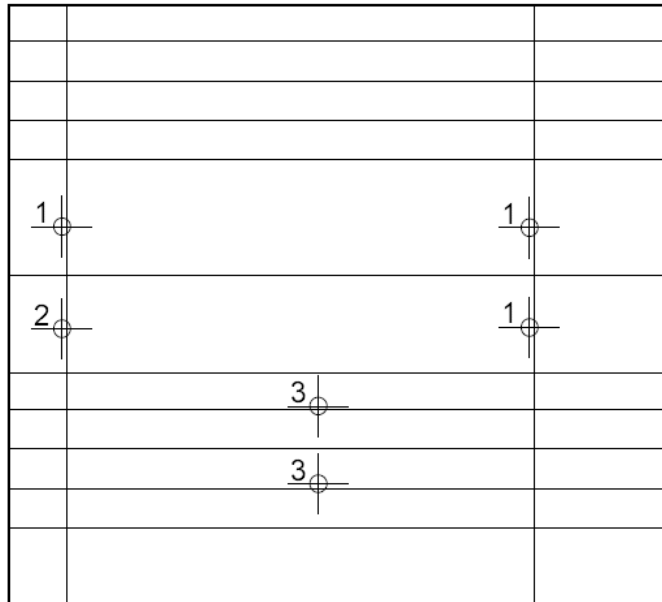


Deleting lines

Finally, delete the lines you do not need.

To delete lines and segments of lines

- 1 Open the shortcut menu of a line you want to delete and select the  **Auto-Delete Segment** tool. Click all line segments you want to delete. Press ESC to quit the tool.
- 2 Open the shortcut menu of the vertical line at bottom left and click  **Delete**. Press ESC to quit the tool.
- 3 Click the **Repeat** dropdown list on the quick access toolbar and select the  **Auto-Delete Segment** tool. Delete the horizontal lines you no longer need. Then press ESC to quit the tool.

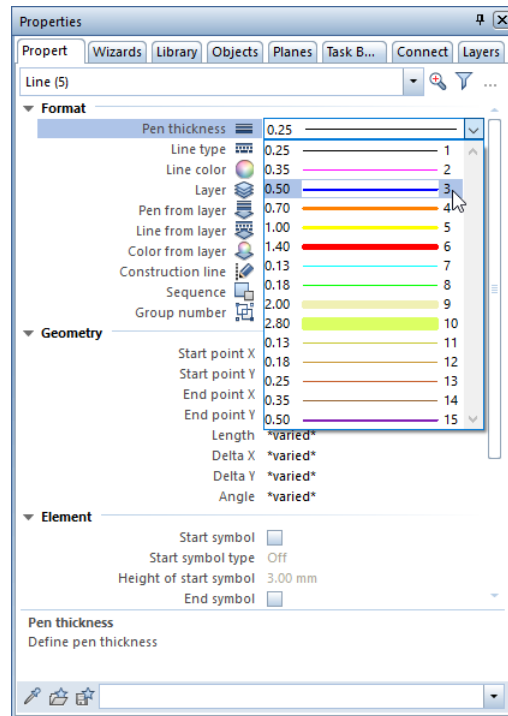


Modifying the pen thickness

The border of the title block needs to stand out.

To modify the pen thickness

- 1 To select the border of the title block, press and hold down the SHIFT key and click a line of the border. This selects all lines with the same group number.
- 2 The **Properties** palette shows the format properties of the selected lines, amongst others.
Click the **Pen thickness** dropdown list and select pen 3 **0.50**.



- 3 To confirm, left-click in the workspace.







Tip: The  **Modify Format Properties** tool (shortcut menu or **Change** task area) produces the same result.

Your drawing should now look like this:

Task 2: entering text for the title block

In the following part of the exercise, you will enter text for the title block using the tools in the **Quick Access** task area (**Design** task).

Tools:

-  X-coordinate (delta point)
-  Y-coordinate (delta point)
-  Copy
-  Edit Text
-  Explode Paragraph
-  Change Text Parameters


Objective:

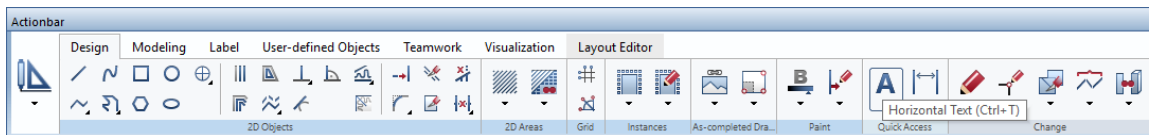
Index	Type of Change	Date / Name
Contents		
Precast Balcony Unit, Type 12		
Project		
New Condominium With Underground Parking		
Client		Date XX.XX.20XX
Client Street, Munich		Drawn by: Name
Architect		Checked by: Name
Architects Street, Munich		Scale: 1:50/2:5
Engineer		Layout numb: XXX
Consulting Engineers Street, Munich		

Entering centered text


Start by entering a label for the contents of the plan in the title block.

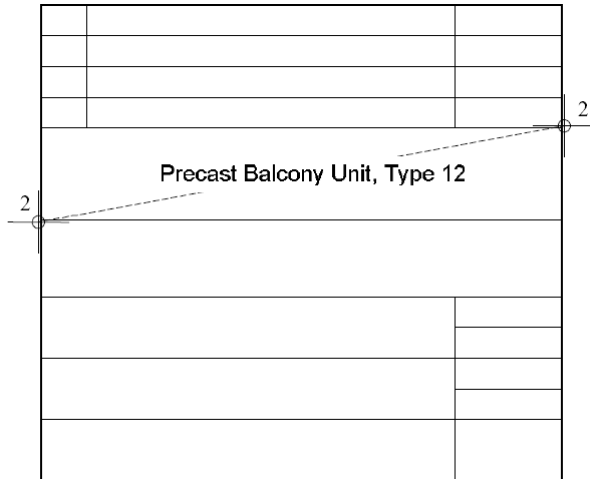
To enter centered text



- 1 Click  **Horizontal Text** in the **Quick Access** task area.

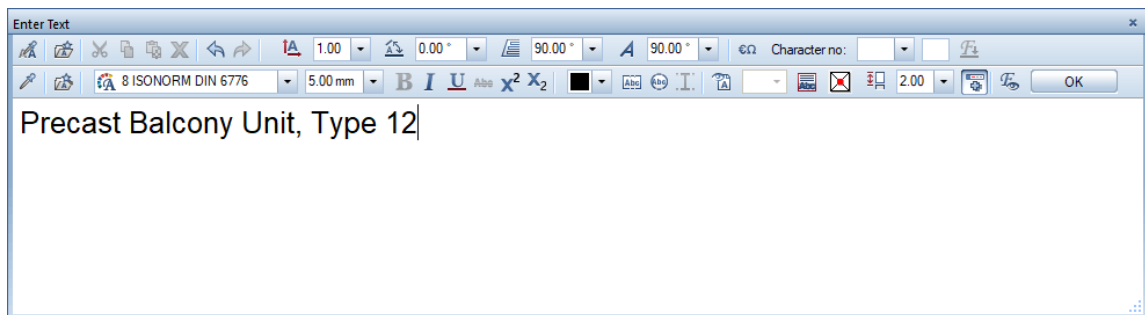



The anchor point of the text will be exactly in the middle of the small rectangle – in other words, the midpoint of an imaginary diagonal line.

- Right-click in the workspace to open the shortcut menu (**Point Assistant**). Select  **Midpoint** and click two diagonally opposite points in the field.




- Click  to expand the dialog box so that all the parameters are visible and enter the text parameters:
 -  Center the text's anchor point.
 - Text height: 5.00 mm
The **Text width** adapts dynamically to the **Aspect ratio** set (in this example: 1.00).
 - Line spacing: 2.00
 - Font: 8 ISONORM DIN 6776.





- 4 Type the text: **Precast Balcony Unit, Type 12**
 - 5 Click **OK** or press CTRL+ENTER.
The  **Horizontal Text** tool remains active.
-

Paragraph text

Enter the name of the construction project in the next field. The lines are left-aligned. Allplan creates any multi-line text you write in one go as paragraph text.

Use   to delete individual lines from a paragraph.

  resolves a paragraph into lines.


Line spacing:


The spacing between lines is based on the **line spacing value multiplied by text height**. Whenever you press ENTER to confirm a line of text, the program automatically goes to the next line.


Point snap and offset entry:

To position text exactly, use the point snap feature and enter an offset. This is very useful when you want to place a point relative to an existing point.





To enter paragraph text

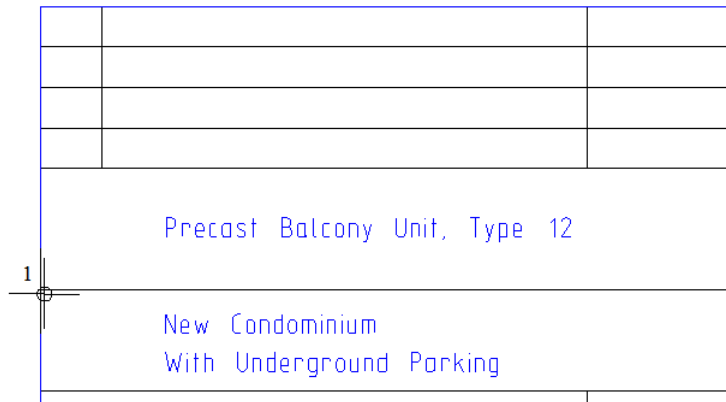
Tip: You can use  to save combinations of text parameters as favorites:


Use  to enter a name in the list and specify the parameters.

- The  **Horizontal Text** tool should still be active.
You will define the anchor point for the text by **snapping a point and entering the offset value**.
- 1 Point to the point in the title block as shown below.
Do not click the point!

Allplan will use this point as the reference point (i.e. the values you enter are measured from this point). The point is marked with a cross.

The values you enter for  and  are based on this reference point (the point snapped). To indicate this, the  **X-coordinate** and  **Y-coordinate** boxes in the dialog line turn yellow.




- 2 Enter **30** for Δx dX, press the TAB key, enter **-5** for Δy dY and press ENTER to confirm.
- 3 Change the position of the text's anchor point to  **top left**.
- 4 Enter the following text:
New Condominium [ENTER]
With Underground Parking
- 5 Press CTRL+ENTER or click **OK** to finish entering text.
- 6 Press ESC to quit the tool.

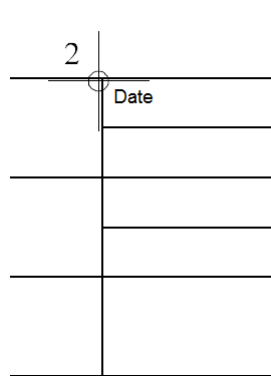
Horizontal text


Enter a line of text on the right in the title block and copy it to the fields below.

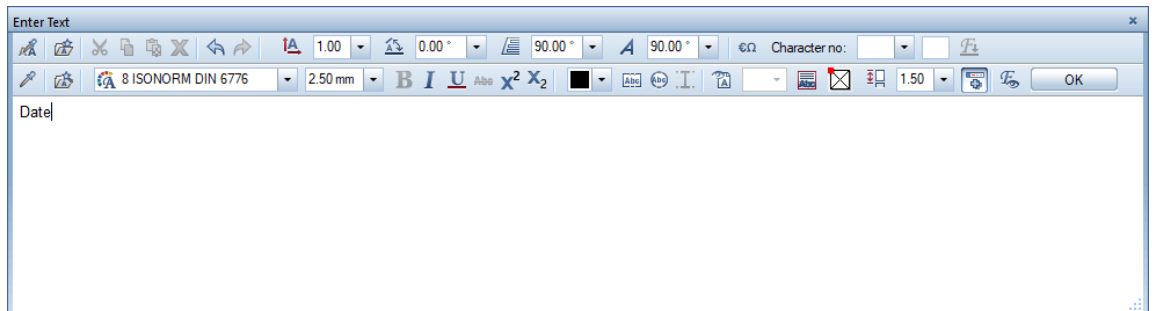
To enter and copy text

- 1 Click  **Horizontal Text** in the **Quick Access** task area.
- 2 Use the point snap feature to specify where you want the text to start:


- A) Point to the top left corner of the field
(see below)
- b) $\Delta x = 2$, TAB key
- c) $\Delta y = -2$
- d) Press ENTER to place the point

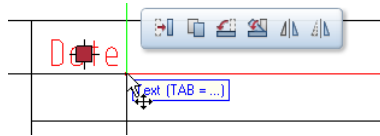


- 3 Set the text's anchor point to  **top left**. Change the **Text height** to **2.5 mm** and the **Line spacing** to **1.5**.
For the sample text, enter: **Date**.

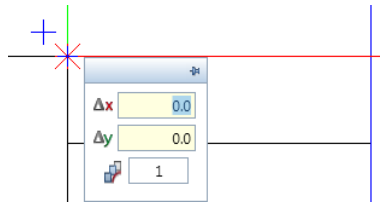



- 4 Click **OK** to confirm.
- 5 Press ESC to quit the tool.
- 6 Left-click the text **Date**.
- 7 Point to a part of the text that is not marked with a handle.

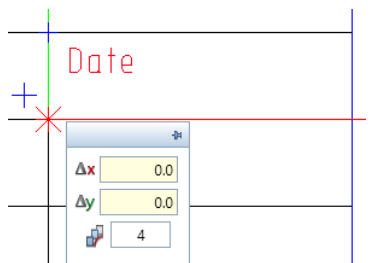
- 8 Click  **Copy** on the context toolbar.



- 9 *From point or enter offset*
Click the top left corner of the field.



- 10 *To point or enter offset*
Enter **4** for the  **Number** of copies in the coordinate dialog box and click the top left corner of the field below.



- 11 Press ESC to quit the tool.


Editing text

Modify the text using the  **Edit Text** tool.

Text modification:

Text can be edited at any time. This provides a comfortable approach if you are using sample text – all you have to do is update the text.

To edit text

- 1 Right-click **Date** at the top and select  **Edit Text** on the shortcut menu.

The relevant dialog box appears and can be modified.

- 2 Press ENTER at the end of the **Date** text to go to the next line. Enter a placeholder for the date in the next line: **XX.XX.20XX**
- 3 Click **OK** to confirm.
- 4 Change the entries underneath and use placeholders as shown here following the instructions given (see steps 2 and 3),

Date XX.XX.20XX
Drawn by: Name
Checked by: Name
Scale: 1.50/25
Layout number: XXX

Changing text parameters


Change the appearance of the placeholder for the layout number. Assign different text parameters. You will give it a character height of 5 mm and a character width of 6 mm. First, you need to 'explode' the paragraph.

Define text parameters:

You can choose from 20 Allplan fonts or from all the TrueType fonts installed.

The **Text height** and **Text width** parameters are absolute values. This means that the text will print using the values you enter, regardless of the selected reference scale.

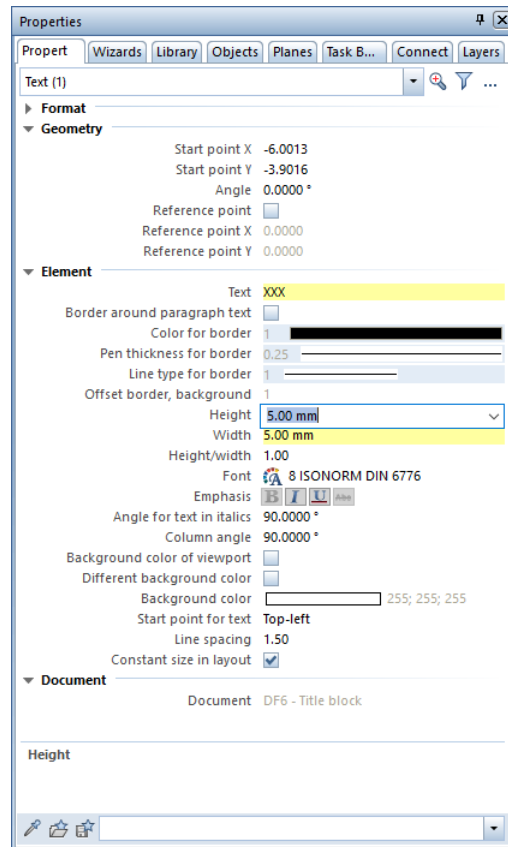
To change text parameters

- 1 Right-click the **Layout number...** paragraph. The shortcut menu opens. Select  **Explode Paragraph**.

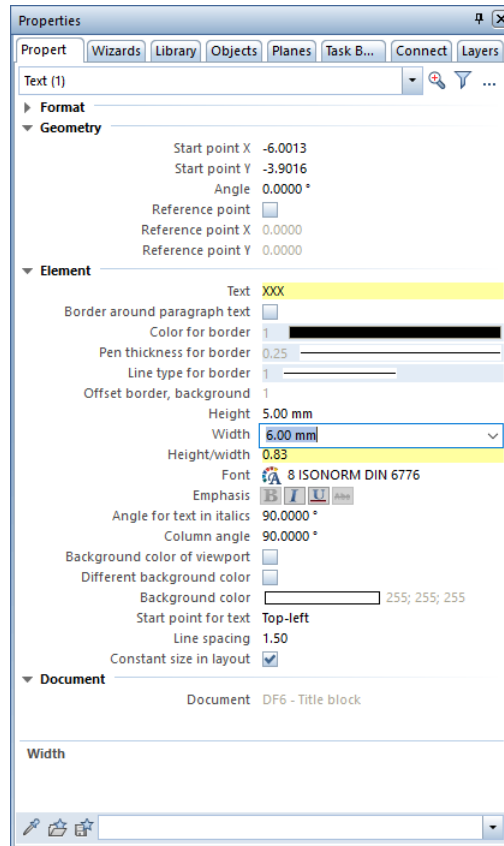
This explodes the paragraph; you can now modify each line separately.

- 2 Press ESC to quit the  **Explode Paragraph** tool.
- 3 Left-click the placeholder XXX.


- 4 The **Properties** palette shows the parameters of the selected text.
Click the box beside **Height** and select **5.00 mm**.



- 5 Click the box beside **Width**, enter **6.00** and press ENTER to confirm.



- 6 Left-click in the workspace.

Note: You can also use the  **Change Text Parameters** tool (shortcut menu of the text you want to modify).



7 Complete the label using the information provided below.

Index	Type of Change	Date / Name
Contents		
Precast Balcony Unit, Type 12		
Project		
New Condominium With Underground Parking		
Client	Client Street, Munich	Date XX XX.20XX
		Drawn by: Name
Architect	Architects Street, Munich	Checked by: Name
		Scale: 1:50/25
Engineer	Consulting Engineers Street, Munich	Layout number XXX

Task 3: saving the title block as a symbol in the library and retrieving the title block

In the last part of this exercise, you will save the title block as a symbol in a folder of the library. Finally, you will retrieve the title block and place it in an empty drawing file.

Tools

Library palette



New group



Insert element



Insert symbol



Find

Symbols

Symbols are design entities that you can use whenever you need. Symbols automatically adapt to the scale of the drawing file. They can be addressed (click with the middle and left mouse buttons) and modified as a single entity. You can alter symbols and save them using another name.

Symbols are often used for drawings and other common components. In time, you will find that you develop your own extensive libraries for title blocks, fixtures, equipment etc. that you can use time and again.

Symbols in the Library palette

Symbols and other library elements (smart symbols, SmartParts, PythonParts) can be stored and managed in any folder in the library. You can create your own folders in the following data paths:

Office: The folders in this path contain the office standard; they are available to the entire office:

- Stand-alone computer: for all local projects
- Computer on the network: for all local and remote users and projects Only the administrator can store and manage symbols.

Project: The folders in this path belong to a particular project; they are available only in that project.

Private: The folders in this path belong to the user that is currently logged on; they cannot be accessed by other users on the network.

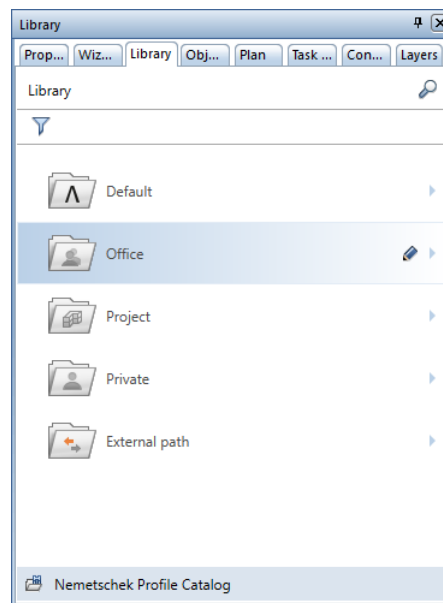
Each folder can contain many library elements. You can copy, delete and rename symbols in the **Library** palette or in Windows Explorer.

Saving a symbol in the library

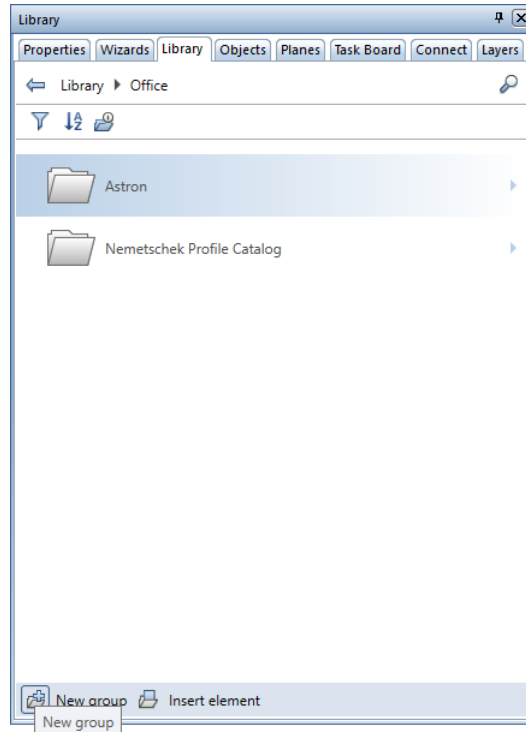
Insert the title block as a symbol in a folder of the library.

To insert a symbol in the library

- 1 Open the **Library** palette.
- 2 The title block is to be made available to the entire office. Therefore, open the **Office** folder.





- 3 Click  **New group** at the bottom of the **Library** palette.

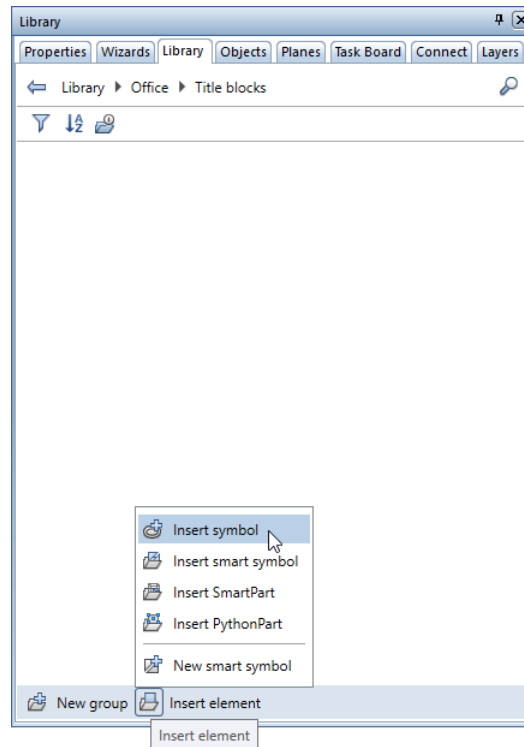


- 4 Enter **Symbols** for the name of the new group and press ENTER to confirm.



- 5 Open the new **Symbols** folder.
- 6 Again, click  **New group** at the bottom of the **Library** palette.
- 7 Enter **Title blocks** for the name of the new group and press ENTER to confirm.
- 8 Open the new **Title blocks** group.

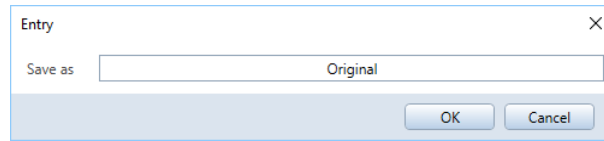
- 9 At the bottom of the **Library** palette, click  **Insert element** and then  **Insert symbol**.



- 10 *Select element(s) you want to save as a symbol file*
Use the left mouse button to open a selection rectangle around the title block. It is displayed in the selection color.
- 11 *Set the symbol's base point*
Click the bottom right corner. This is the point at which the symbol will be attached to the crosshairs when it is retrieved.
- 12 A dialog box opens. Choose **Dumb symbol without Snoop functionality** and click **OK** to confirm.

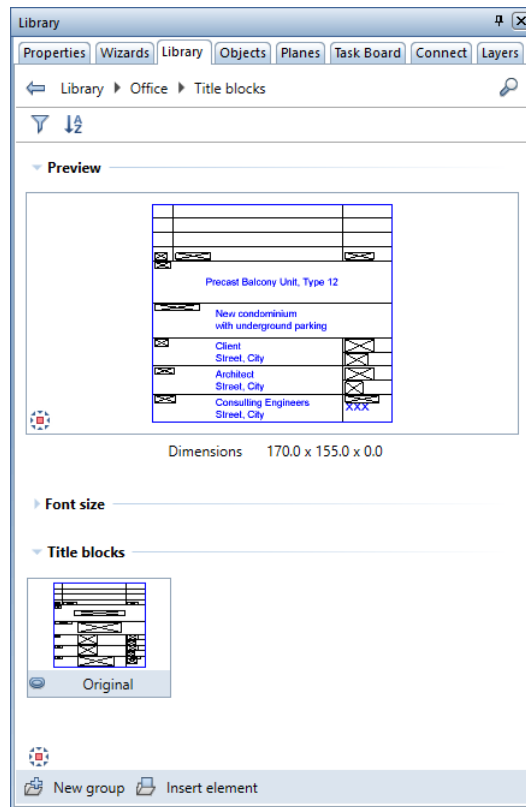
Tip: You can also change the position of a symbol's base point when you retrieve the symbol.

- 13 Enter **Original** for the name of the new symbol and click **OK** to confirm.



- 14 This saves the new **Original** symbol to the **Title blocks** folder.

Tip: You cannot see the symbol in the preview? Check that the **Wireframe** view type and the **Plan** view are active.




Retrieving a symbol from the library

Now retrieve the symbol and place it in an empty drawing file.




In practice, the new drawing file might be a drawing file for another construction project. All you would need to do then is change the project-specific information and save the title block again as a symbol – this time in the **Project** folder.

Besides the symbols you create and save yourself, you can use this approach to retrieve symbols from the Allplan library.

To retrieve a symbol from the library

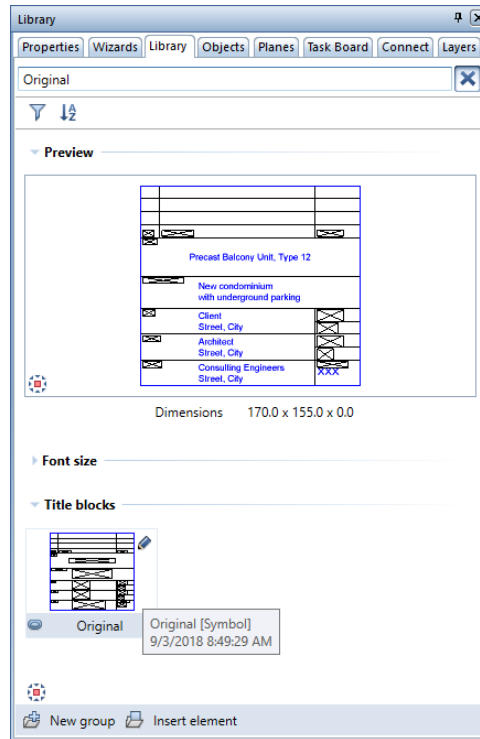
- 1 Click  **Open on a Project-Specific Basis** (quick access toolbar), open a new, empty drawing file and close the drawing file with the **Title block**.

Click the scale set on the status bar and select **1:1**.

- 2 As you have just saved the **Original** symbol, this folder is still open in the **Library** palette.
If it isn't, click  to navigate through the **Library** palette or click  to find the file you need.
- 3 If you want to  **Find** the file, enter its name in the line at the top of the **Library** palette. In this example, enter **Original** and press ENTER to confirm.

The **Library** palette displays the file in question.


Point to the illustration of the file to display a ToolTip with information on the file type (symbol in this example), the date the file was saved and the folder where it was saved (`\Office\Symbols>Title blocks` in this example).



- 4 Double-click the **Original** symbol with the left mouse button or drag it into the workspace.

The symbol's base point is attached to the crosshairs.

- 5 To place the symbol, click in the workspace.

- 6 If the title block appears too small, click  **Zoom All** in the border of the viewport.

Tip: Using the input options, you can change the position of the symbol's base point and define a cursor snap angle.

The tools on the shortcut menu help you define the symbol's drop-in point precisely.

When placing the title block, you can use the input options to change the size of the title block by resizing it in the x-direction and y-direction. First, you define a fixed point and then you specify the resizing factors.

Additional tools for placing elements

The Input Options provide a number of tools that help you place elements:



Use this to position the drop-in point.

Df Pnt

You can use the default drop-in point. This is the point you chose when you defined the smart symbol or symbol.

Ang=

Use this to switch between a fixed ('0') and freely definable ('?') drop-in angle. When you have selected '?', you can enter the angle after placing the element, or you can click a line and match its angle.

Note: Using the + and - keys, you can rotate the element displayed attached to the crosshairs by a cursor snap angle in a clockwise or counter-clockwise direction. You can specify this angle using **Cursor snap angle** (see below).

Num=

Use this to define the number of the elements to be placed. **Num=1** places one element; **Num=?** places any number of elements.

Resize

You can use this to resize the element in the x-direction, y-direction and z-direction by first defining a fixed point and then specifying the resizing factors.

Tip: When you activate **Ang=?** before you click **Scale**, you can define an angle and then resize the (smart) symbol you are about to place.

Snoop

You can use this to rotate the element so that it is parallel to existing architectural lines (e.g. walls). This is done automatically when you position the cursor over the architectural line. In the case of (smart) symbols defined as **Intelligent symbol/smart symbol with snoop functionality**, the distance to the architectural line is based on the setting made when you defined the relevant (smart) symbol. For more information, see Intelligent (smart) symbols. 'Normal' (smart) symbols or elements from the Clipboard are placed using an offset value of 0.

Drop

You can use this to define a custom drop-in point by clicking it in the dialog box.

Attribute

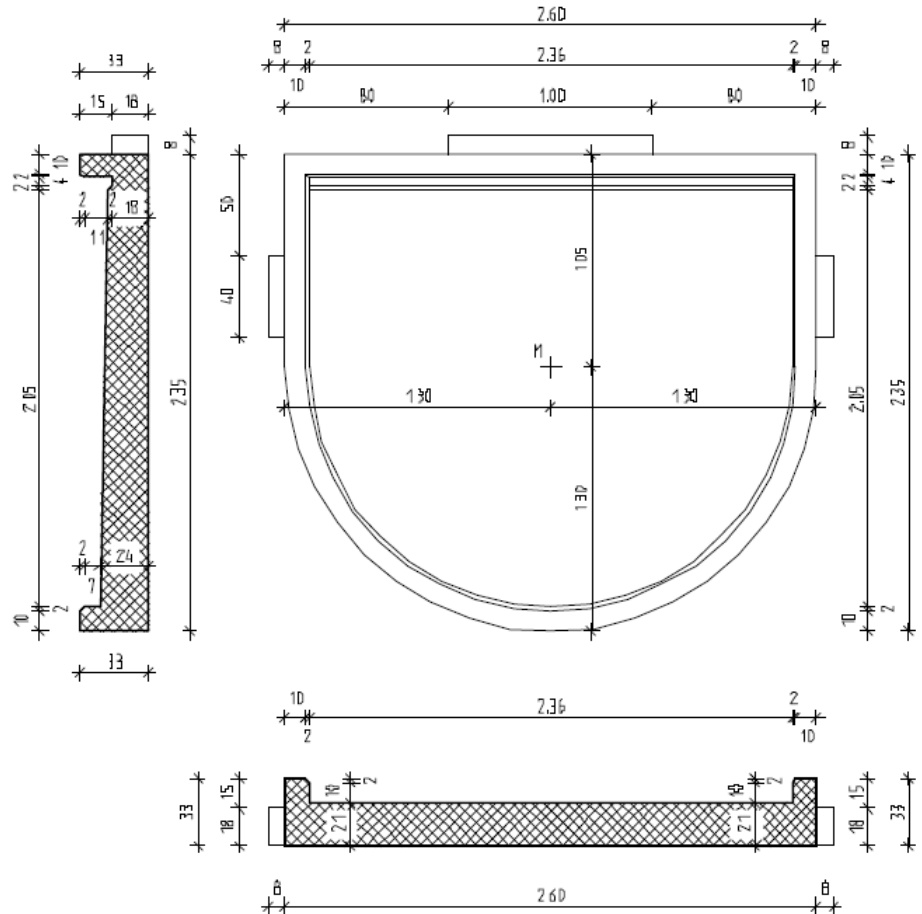
You can use this to assign attributes to (smart) symbols.


Cursor snap angle

You can use this to set the angle by which the element is rotated when you click the + or - keys.

Exercise 6: Precast Balcony Unit

In this exercise, you will create a general arrangement drawing for a precast balcony unit with dimensions and hat ching. Finally, you will create a quick printout of the precast element.














You will design the precast element using the tools in the **2D Objects** and **Quick Access** task areas. To print the result, you will use the  **Print Preview** tool (Quick Access Toolbar).

Task 1: designing the precast balcony unit

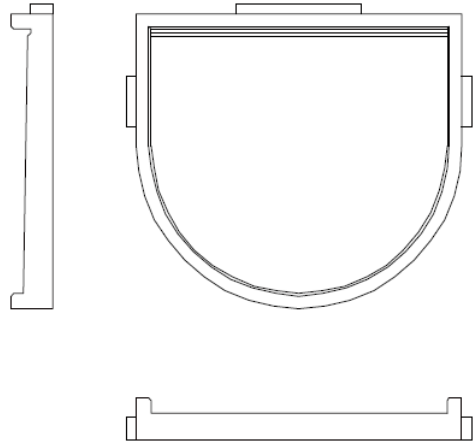
In the first part of this exercise, you will draw the floor plan and two sections for a precast balcony unit.

You will use the tools in the **2D Objects** task area (**Design** task).

Tools:

-  Rectangle
-  Fillet
-  Parallel to Element
-  Auto-Delete Segment
-  Line
-  X-coordinate (delta point)
-  Y-coordinate (delta point)
-  Copy and Mirror
-  Midpoint
-  Stretch Entities
-  Fold Line


Objective:






Default settings

Start by defining the default settings.

To select a new drawing file and set the options

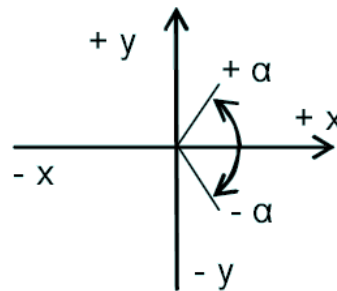
- 1 Click  **Open on a Project-Specific Basis** and open an empty drawing file. Enter **Precast balcony unit** for its name and close all the other drawing files.
 - 2 Click the **Length** set on the status bar and select **m**.
 - 3 Click the **Scale** set on the status bar and select **1:25**.
-

Tip: If you want to change the scale using the  **Reference Scale** tool on the **View** menu, press the ALT key to show the hidden menu bar for a short time. Using the  **Reference Scale** tool -  icon, the scale you define is also presented for selection on the status bar.

Note: You can also show the menu bar all the time. To do this, open the dropdown list on the Quick Access Toolbar (title bar) and click **Show menu bar**.

You will start by drawing the outline.

Bear the coordinate system in mind and the direction of rotation of angles!



To display the section you want, use the tools at the bottom of the viewport:





Zoom All





Zoom Section


You can also use the mouse to define the section that is displayed on screen:

- Open the  **Options – Desktop environment – Mouse and crosshairs: Keeping the right mouse button held down – Zoom function** is selected by default. As a result, you can zoom using the right mouse button.
- You can use the mouse wheel to dynamically enlarge or reduce the section displayed on screen.
- Double-click with the middle mouse button to display the screen contents in their entirety.
- You can pan by pressing and holding down the middle mouse button; a hand is displayed with the crosshairs. If you work with a two-button mouse (for example, Mac computers), you can select the **Ctrl + Shift + left mouse button held down – Pan function (for two-button mouse)** option ( **Options – Desktop environment – Mouse and crosshairs**).

Drawing the outline



To draw the outline in plan

- 1 Click  **Rectangle (2D Objects** task area).
- 2 The **Rectangle** Context toolbar opens. Select  **Based on diagonal line**.


Note:  Make sure that **Create rectangle as a polyline** is not active in the input options, as you will edit individual lines of the rectangle later.




- 3 Click where you want the rectangle to start.

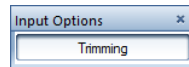
When you move the mouse, a preview of the diagonally opposite point is displayed attached to the crosshairs (“rubber-band”).

- 4 *Diagonal point*
Enter a length of  **2.60**. Press the TAB key and enter **1.05** for the  width.
Press ENTER to confirm.

Tip: Did you make an incorrect entry?

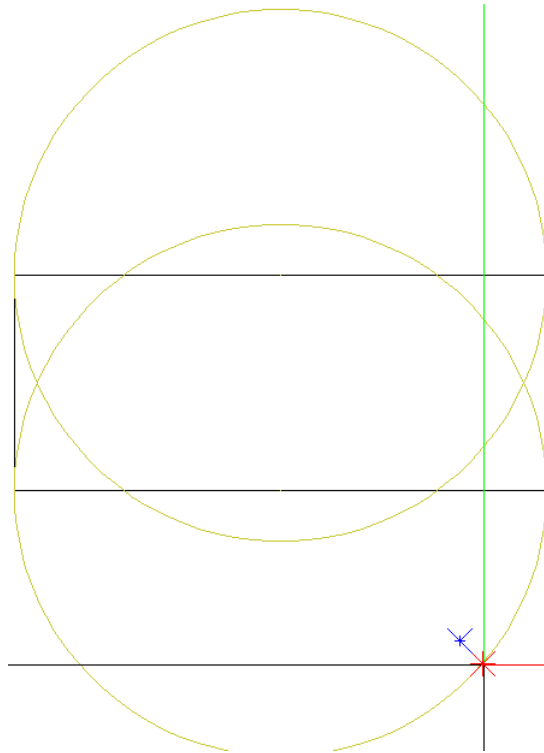
Click  **Undo** (quick access toolbar).





- 5 Click  **Zoom All** in the border of the viewport.
- 6 Press ESC to quit the  **Rectangle** tool.
- 7 Next, you want to fillet the vertical lines. Open the shortcut menu of the left or right side of the rectangle and select the  **Fillet** tool.
- 8 **Trimming** is displayed in the input options. When this button is active (default setting), Allplan automatically shortens or lengthens the initial lines as far as filleting starts. If trimming isn't active, click to activate it now.



- 9 Click the other vertical side of the rectangle and confirm the radius of the fillet proposed by the program.

Allplan offers four options for applying a fillet. Select the semi-circle at the bottom.





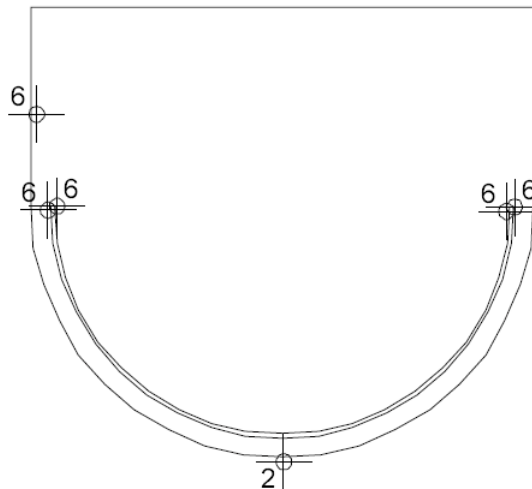
- 10 Click  **Zoom All** again.
 - 11 Press ESC to quit the  **Fillet** tool.
 - 12 Delete the bottom line of the rectangle.
Right-click this line and select  **Delete** on the shortcut menu.
(Alternatively, you can also select  in the **Edit** task area and then click the line).
 - 13 Press ESC to quit the tool.
-

Creating inner parallel lines

Next, you will draw the inner lines of the precast balcony unit.

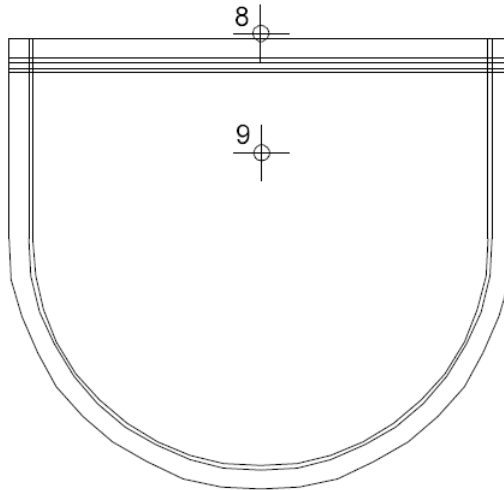
To create inner parallel lines

- 1 Click  **Line (2D Objects** task area).
- 2 Click the semi-circle you have just created.
- 3 Enter **0.1** to define the offset.
Which side?
Click within the outline; Allplan is copying the circle inwards.
Press ENTER to confirm the number (**1**).
- 4 For the next offset, enter **0.02**.
Which side? Click the inside again.
Confirm the number (**1**).
- 5 Click  again to create lines parallel to the lines on the sides.
- 6 Click the line on the left and then the endpoints of the semi-circle one after the other (see below).



- 7 Click  again to create lines parallel to the line at the top.


- 8 Click the line at the top and enter **0.1** for the offset.






- 9 Click below the line to specify the side where you want to create the parallel lines. Confirm the number (1).
- 10 Create another three parallel lines. Enter **0.02** for the first offset, **0.04** for the second offset and **0.02** for the third offset. Confirm the number (1) each time.
- 11 Press ESC to quit the tool.

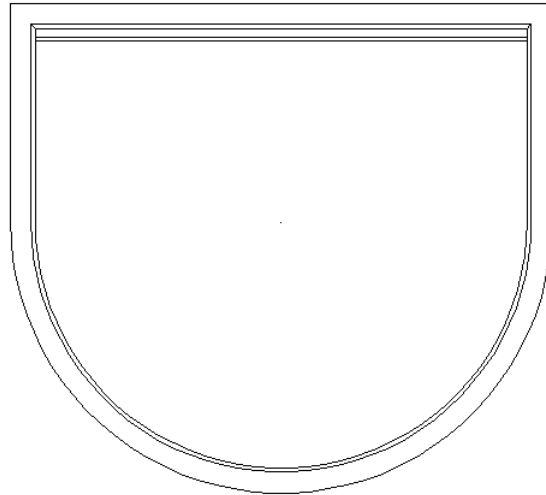
Deleting redundant line segments and drawing fillets

Delete the redundant line segments in the corners and complete your design by adding fillets.

Tip: If you inadvertently deleted elements, you can quickly restore them by immediately right-clicking in the workspace twice (undoing the last action). You can also use  **Undo**. You can go back (undo) as many steps as you want, as far back as the last time the data were saved and compressed.

To delete redundant line segments and to add fillets

- 1 Right-click one of the lines you want to delete and select  **Auto-Delete Segment** on the shortcut menu.
- 2 Click all the line segments you want to delete.
Use  **Zoom Section** (at the bottom of the viewport) to set a suitable view. This tool appears when you move the cursor to the bottom of the viewport.
- 3 Click  **Line (2D Objects)** task area.
- 4 Draw the two fillets as shown below.
Your drawing should now look like this:




- 5 Press ESC to quit the tool.

Drawing 'Isokörbe'

Create 'Isokörbe' (special type of reinforcement cage) at the top and on the sides.

To draw 'Isokörbe' in plan

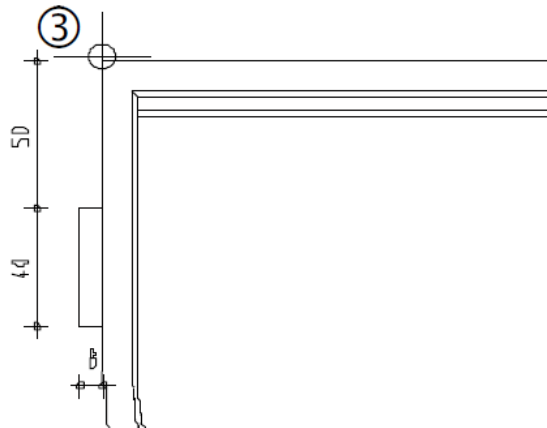
- 1 Click  **Line** in the **2D Objects** task area.

- 2 Click  **Polyline** on the **Line** Context toolbar.
- 3 Point to the top left corner.

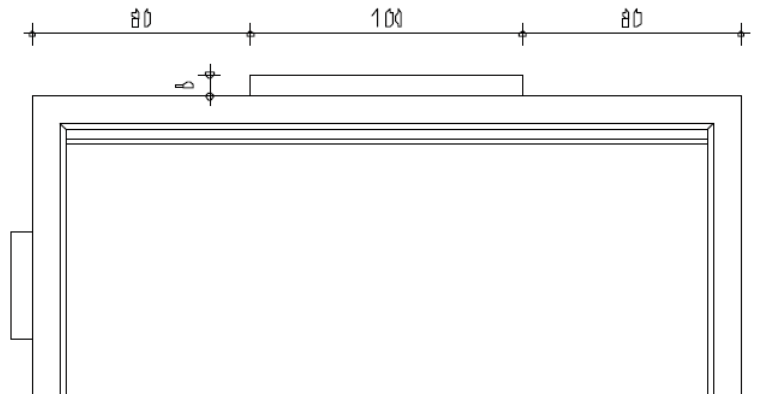
Allplan will use this point as the reference point (i.e. the values you enter are measured from this point). The point is marked with a cross.


The values you enter for Δx and Δy are based on this reference point (the point snapped). To indicate this, the Δx **X-coordinate** and Δy **Y-coordinate** boxes in the dialog line turn yellow.
- 4 Press the TAB key to go to the Δy **Y-coordinate** box. For **dY**, enter **-0.50** and press ENTER to confirm.

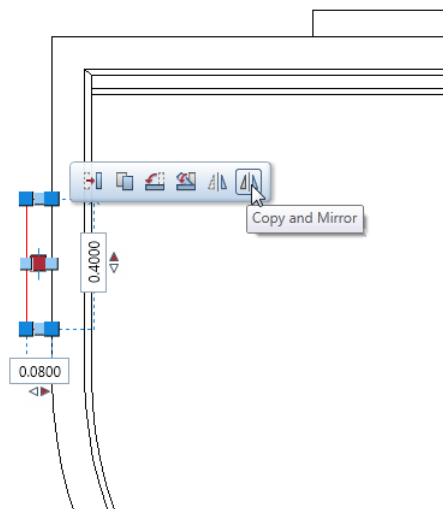
This defines the starting point of the line.
- 5 Enter the following values in the dialog line:
 Δx **dX** = -0.08
 Δy **dY** = -0.40
 Δx **dX** = 0.08
- 6 Press ESC to quit the tool.




- 7 Now draw the 'Isokorb' at the top using the procedure previously described. Careful with the direction and the sign (positive/negative)!



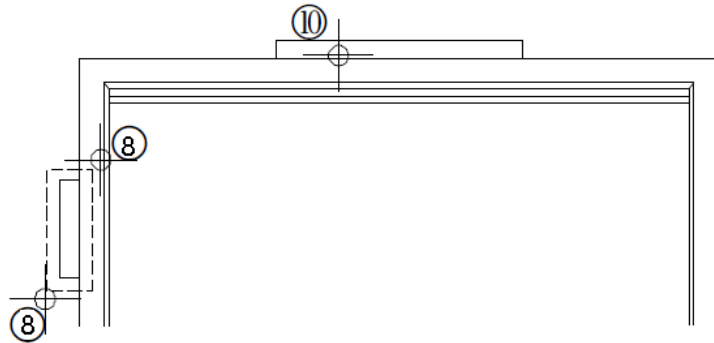
- 8 You can create the 'Isokorb' on the right by mirroring the one on the left. Select the 'Isokorb' on the left by enclosing it in a selection rectangle you open from left to right using the left mouse button.
- 9 Click  **Copy and Mirror**.




- 10 To define the first point for the mirror axis, right-click the line at the top and select  **Midpoint** on the shortcut menu.

Make sure that you do not click the midpoint of the line or any other existing point.

This defines the first point of the mirror axis.






- 11 To obtain a mirror axis that is exactly vertical, press the TAB key to switch to the  **Y-coordinate** box in the dialog line. Enter any **dY** value (not equal to 0). This creates the 'Isokorb' on the right, completing the design.
- 12 Press ESC to quit the tool.

Outline of longitudinal section


Next, you will draw the outline of the longitudinal section and place it below the floor plan.

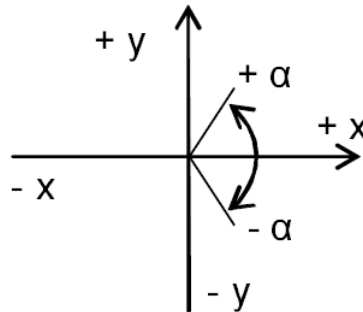
To draw the outline of the longitudinal section

- 1 Again, select  **Line** in the **2D Objects** task area.
- 2 Click  **Polyline** on the **Line** Context toolbar.
- 3 Switch to the **Properties** palette, click the  **Pen thickness** dropdown list and choose **0.50 mm**.

Note: While you are drawing, you can change the pen thickness in the **Properties** palette at any time.

- 4 Place the first point below the plan.
Create the lines by entering the following values one after the other in the dialog line:

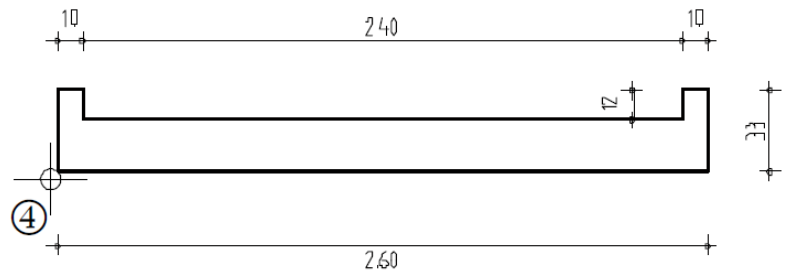
Tip: If you have entered an incorrect value, click  on the **Line** Context toolbar. This deletes the last entry and you can resume your work at the end point of the previous line.



Bear the coordinate system in mind!

Δx dX = 2.60, Δy dY = 0.33, Δx dX = -0.10, Δy dY = -0.12

Δx dX = -2.40, Δy dY = 0.12, Δx dX = -0.10, Δy dY = -0.33.

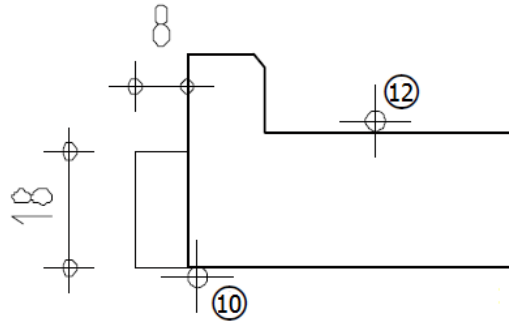


- 5 Press ESC to quit the tool.
-

Δx dX = -0.08

Δy dY = 0.18

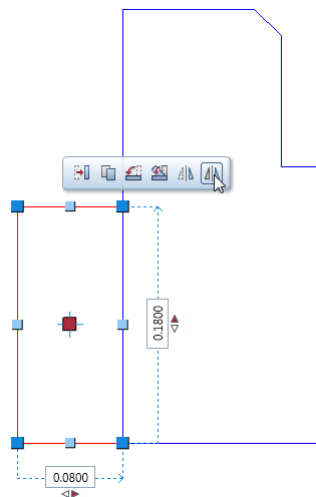
Δx dX = 0.08






11 Press ESC to quit the  Line tool.

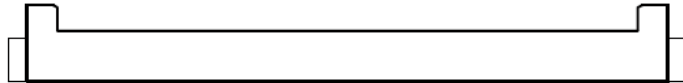
12 Create the 'Isokorb' on the right-hand side of the longitudinal section using  Copy and Mirror:

- Enclose the 'Isokorb' in a selection rectangle you open from left to right using the left mouse button.



- Point to a line and click  **Copy and Mirror** on the context toolbar.
- Right-click the line at the top and select  **Midpoint** on the shortcut menu.
- Press the TAB key to switch to  **Y-coordinate** in the dialog line and enter any value for **dY**.

Your design should now look like this:





13 Press ESC to quit direct object modification.

Drawing the cross-section

Finally, you will draw the entire cross-section in a single operation.

To draw the cross-section

- 1 Select pen thickness **0.50** mm in the **Properties** palette and click  **Line** (2D Objects task area).
- 2 Click  **Polyline** on the **Line** Context toolbar.
- 3 Place the starting point at the top so that the cross-section is to the left of the floor plan.

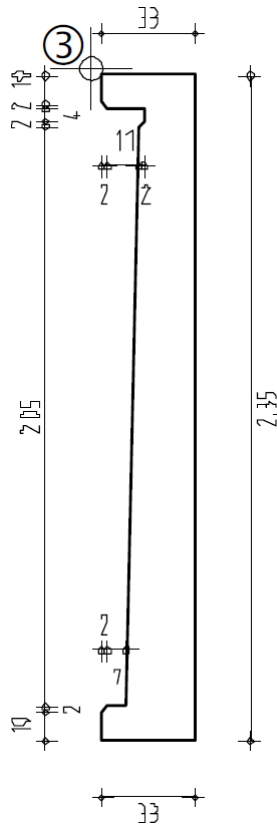
Tip: *Skip a coordinate.*

Pressing the TAB key takes you to the next data entry box.

Enter relative coordinates.

Enter values for Δx , Δy and Δz in the dialog line (use the TAB key to switch between the data entry boxes) until you find the drop-in point. Press ENTER to place the point.

- 4 Enter the following values one after the other in the dialog line. Compare your result with the graphics on the left.



Δx dX = 0.33 ENTER

Δy dY = -2.35 ENTER

Δx dX = -0.33 ENTER

Δy dY = 0.10 ENTER

Δx dX = 0.02 TAB

Δy dY = 0.02 ENTER

Δx dX = 0.07 ENTER

(press the TAB key to switch to Δx)

Δx dX = 0.04 TAB

Δy dY = 2.05 ENTER

Δx dX = 0.02 TAB

Δy dY = 0.02 ENTER

(press the TAB key to switch to Δy)

Δy dY = 0.04 ENTER

Δx dX = -0.13 ENTER

(press the TAB key to switch to Δx)

Δx dX = -0.02 TAB

Δy dY = 0.02 ENTER

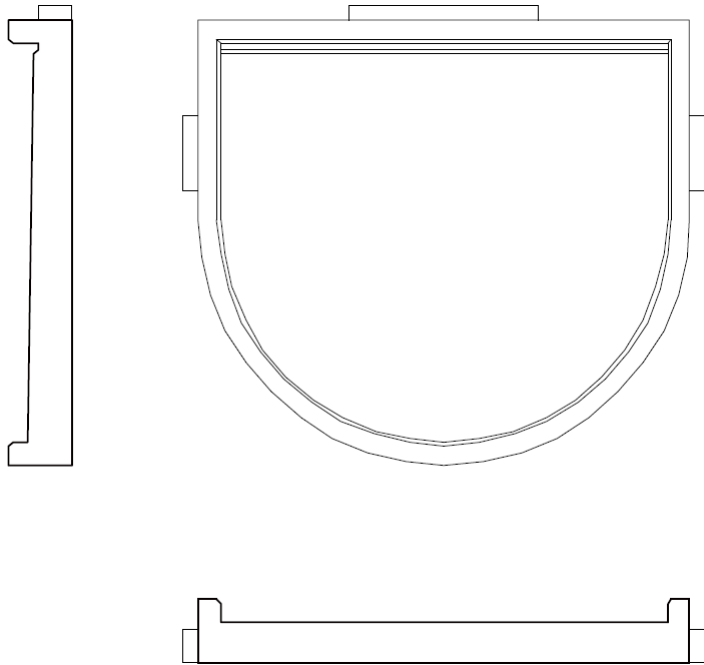
(press the TAB key to switch to Δy)

Δy dY = 0.10

- 5 Press ESC to quit the tool.

- 6 Select pen thickness **0.25 mm** (**Properties** palette) and draw the 'Isokorb' (8/18 cm) at the top.






Your drawing should now look like this:



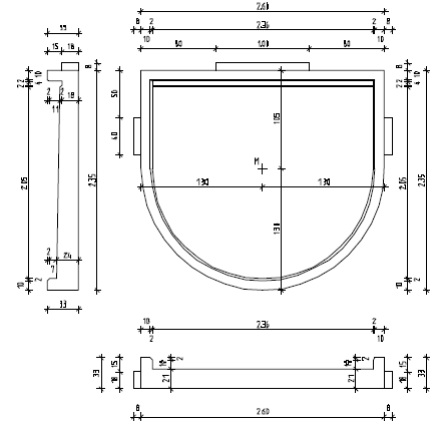
Task 2: dimensioning the precast balcony unit

Next, you will dimension the precast balcony unit using the tools in the **Quick Access** task area.

Tools:

-  Horizontal Dimension Line
-  Vertical Dimension Line
-  Auto Dimensioning
-  Add Dimension Line Point
-  Modify Dimension Line


Objective:



The first step is to define the dimension line parameters. Dimensioning then involves three steps:

- Define the type of dimension line (vertical, horizontal, angle or direct)
- Specify a location for the dimension line
- Click the points you want to dimension

You can modify dimension lines at any time: For example, you can add and delete dimension line points, move dimension lines and change the settings for dimension line parameters.

Tip: Using the  **Options - Dimension line** page, you can set a tolerance value for tilted (dimension) text, specify the decimal separator and enter values for blanking.

Setting dimension line parameters



Start by making settings for the dimension line parameters.

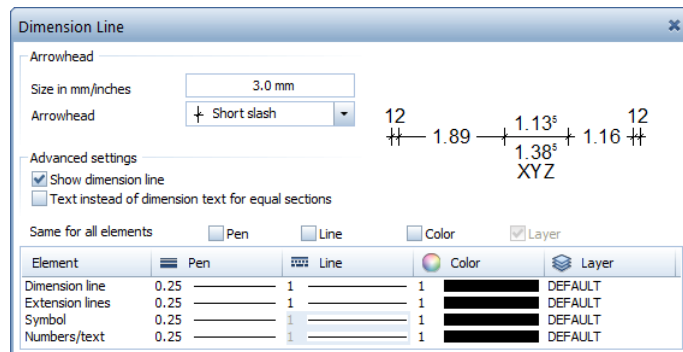
The most important parameters are the unit, the position of the dimension text and the dimension text height and width.

Dimension lines always reference the design dynamically (dimension lines are associative; the points you click are the reference points).

Dimension lines automatically update to reflect any changes you make to the design.

To set dimension line parameters

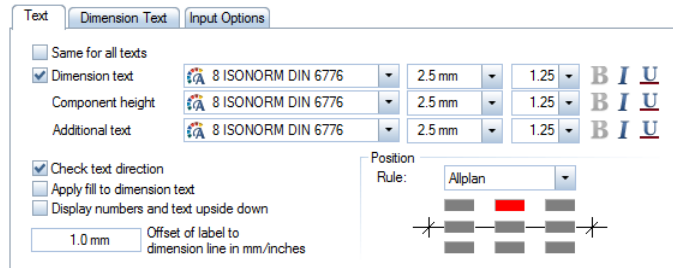
- 1 Click  **Dimension Line** (Quick Access task area).
- 2 Click  **Properties**.
- 3 Check the settings in the top (general) part of the dialog box, select an **Arrowhead** (slash), enter its **Size** (3.00) and set the **Format properties** for the components of the dimension line.



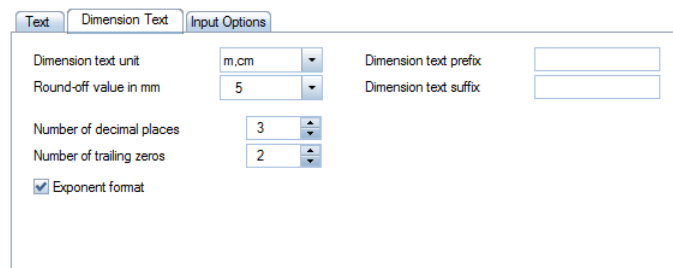
Allplan creates the dimension lines with the pen, line, color and layer set here, regardless of the settings in the **Properties** palette.

- 4 Check the settings on the **Text** tab in the bottom part of the dialog box and set the text parameters as shown below.
- 5 Select a font and define the dimension text height and width by entering the following values:

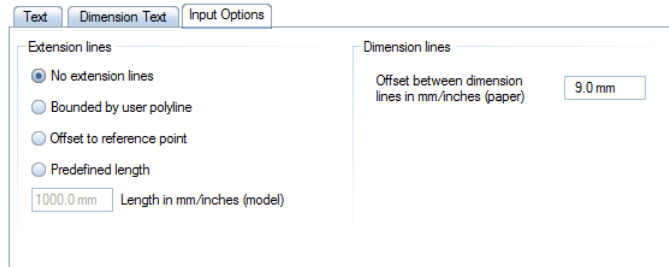
- Dimension text height: 2.50 mm
 - Aspect: 1.25 (this results in a text width of 2.0)
- 6 To define the **Position** of the dimension text, click the upper box in the middle.




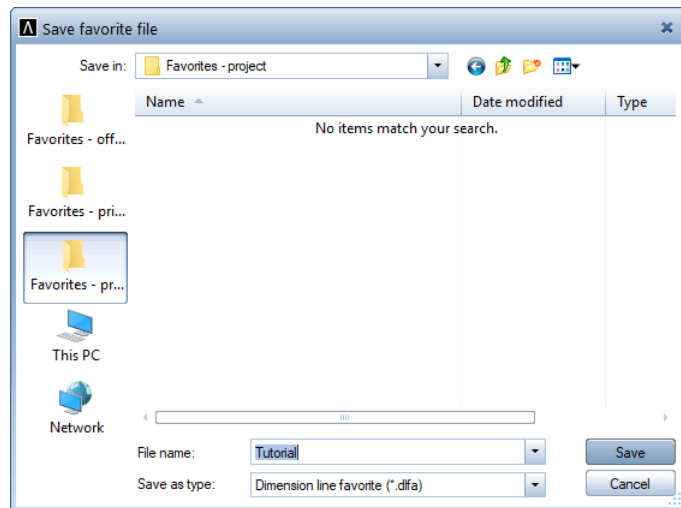
- 7 Open the **Dimension Text** tab and check the following parameters:
- Dimension text unit: m, cm
 - Round-off value in mm: 5
 - Number of decimal places: 3
 - Number of trailing zeros: 2
 - Exponent format option: selected



- 8 Open the **Input Options** tab and select the **No extension lines** option.
Set the **Offset between dimension lines in mm/inch (paper)** to **9**.



- 9 Click  at bottom left and save the parameters as a favorite file.
For example, enter "Tutorial" for the name of the file.





- 10 Click **Save** to confirm.
11 Click **OK** to confirm the **Dimension Line** dialog box.

Creating horizontal dimension lines

You will dimension the longitudinal section using horizontal dimension lines.


To create horizontal dimension lines

➤ The  **Dimension Line** tool is still open.

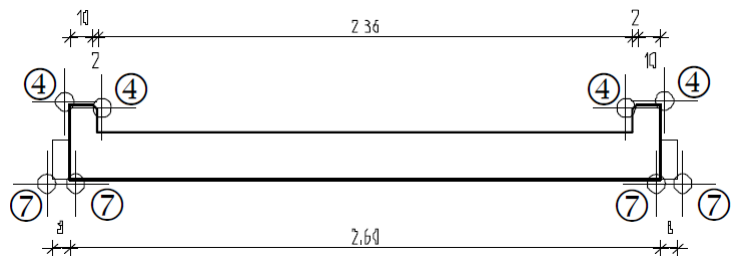
- 1 Set the view so that there is enough space at the top for the dimension line.
- 2 On the Context toolbar, click  **Horizontal**.
- 3 *Through point or click dimension line*
Define the position of the dimension line by clicking above the longitudinal section. This is the point through which the dimension line will pass.
- 4 Click the six points you want to dimension.

A preview of the dimension line is displayed immediately. Any new points you click are automatically included in this preview. You can click the points to be dimensioned in any sequence.

- 5 To finish adding points, press ESC.

 **Horizontal** remains active so that you can create the next dimension line.




- 6 *Through point or click dimension line*
Click below the longitudinal section to define the point through which the dimension line is to pass.
- 7 Click the points to be dimensioned and press ESC to finish creating horizontal dimension lines.



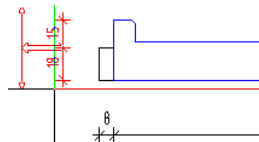
Creating vertical dimension lines

You will continue with vertical dimension lines.



To create vertical dimension lines

- The  **Dimension Line** tool is still open.
- 1 On the context toolbar, click  **Vertical**.
- 2 Click to the left of the longitudinal section to define the point through which the dimension line is to pass.
- 3 Click the corners of the 'Isokorb' and the upstand and press ESC to quit the tool.
 **Vertical** remains active so that you can create the next dimension line.
- 4 *Through point or click dimension line*
 Point to the left of the dimension line, as the next dimension line is to be to the left of the first one.

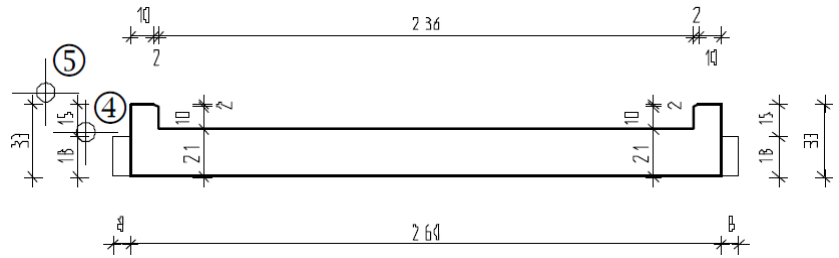
Allplan snaps to this dimension line and displays it in the selection preview color. A symbol indicates the side on which the new dimension line will be created.



- 5 Click in the workspace to confirm.
- 6 Click the points to be dimensioned.

Tip: You can specify the distance between dimension lines in the  **Properties**. You can also move dimension lines later using the  **Move Dimension Line** tool.



- 7 Now you should be able to create the missing vertical dimension lines in the section and on the right yourself.



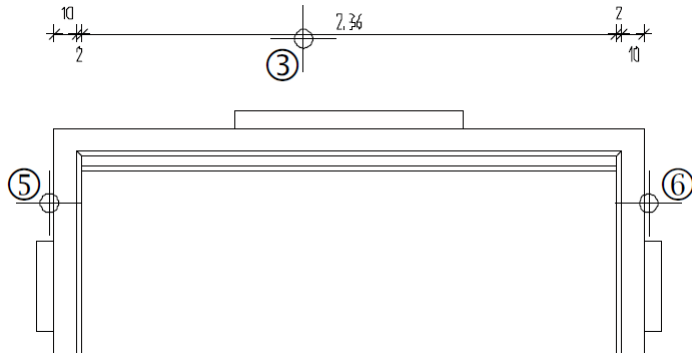
Creating dimension lines automatically

A part of the floor plan will be dimensioned automatically. All you need to do is draw a line through the components. Allplan will automatically dimension the points where the line and the components intersect.

To create dimension lines automatically

- 1 Click  **Dimension Line** (Quick Access task area).
- 2 Click  **Match parameters from dimension line** and click an existing dimension line.
- 3 Click above the floor plan to define the point through which the dimension line is to pass.
- 4 *Place direction point 1 or enter a direction angle or line.* Confirm the value **0.00**.
- 5 *Point 1 for clipping path.* Define the first point by clicking above the 'Isokorb' to the left of the outer edge of the precast element.
- 6 *Next point for clipping path.* Click the equivalent point on the right.

- 7 *Next point for clipping path:* Press ESC twice to quit the tool. Allplan automatically dimensions all the points where the line and the design intersect.




Adding dimension line points


The dimensions of 'Isokörbe' are still missing. So the next step involves adding the relevant dimension line points.

Any changes you make to the design using modification tools will automatically be reflected in the dimension lines if all the dimension lines are in the same drawing file or if the drawing file with the dimension lines is open in edit mode.

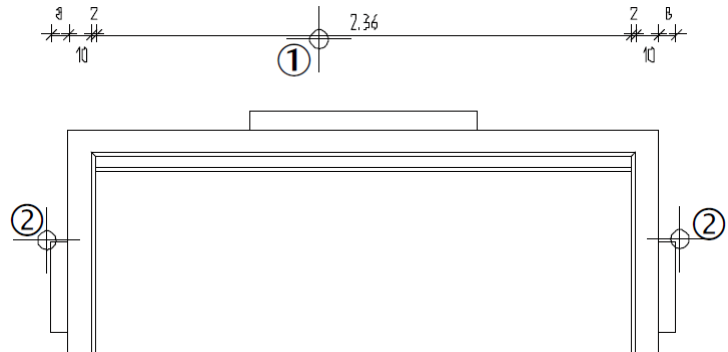
There are times when you will find that dimension line points are missing or no longer required as the design has changed. In these cases, you do not need to create new dimension lines. You can simply add or delete dimension line points.

To add dimension line points

- 1 Right-click the dimension line to which you want to add dimension line points and select  **Add Dimension Line Point** on the shortcut menu.


Tip: To remove a dimension line point, open the shortcut menu of a dimension line and click  **Del Dimension Line Point**. Then click the point you want to delete.

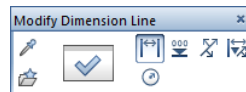
- Click the points to be dimensioned (left and right outer edges of the 'Isokörbe').







- Press ESC twice to quit the tool.

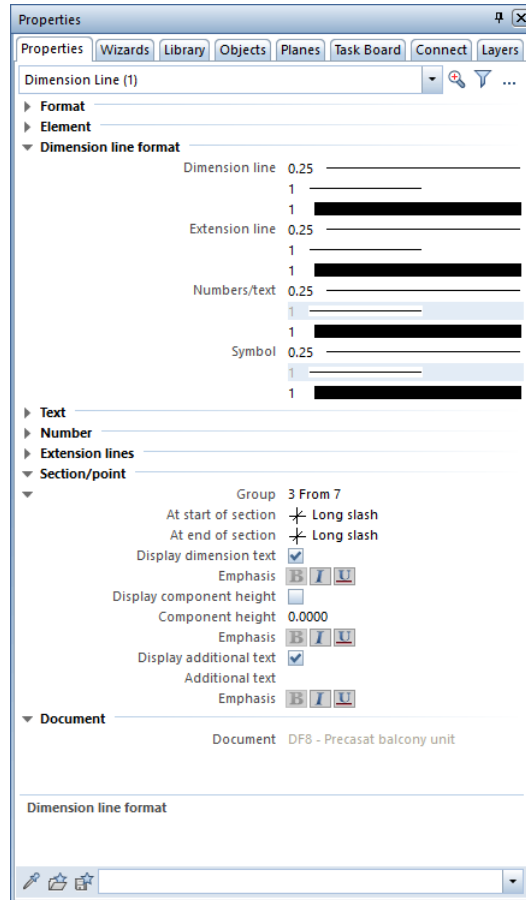
It is also possible to change the parameter settings of dimension lines (apart from the spacing between dimension lines).

- Click  **Modify Dimension Line** (shortcut menu of a dimension line or **Label** task - **Dimension** area).



- Set the new dimension line parameters in the  **Properties** and then click the dimension lines to apply the changes. You can also use the parameters of dimension lines you have already created. Click  **Match parameters from dimension line** and click the dimension line whose settings you want to use.
- You can also use the context toolbar to select a dimension line type to which you want to apply the new parameters and then enclose all the dimension lines in a selection rectangle.








- To modify a dimension line, you can also left-click the dimension line and select and change dimension line parameters in the **Properties** palette. For example, you can change arrowheads or alter other parameters of the dimension line section clicked. Use  and  to toggle between the individual dimension line sections or elevation points.



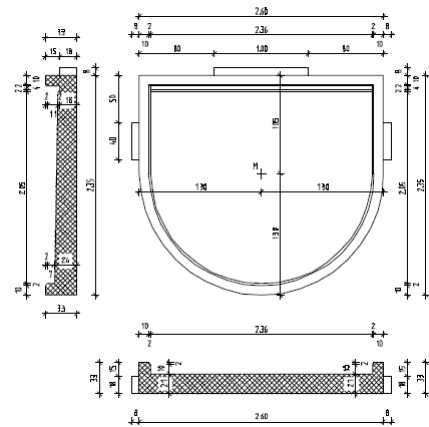
Task 3: applying hatching to precast balcony unit and printing the screen contents

In the following part of the exercise, you will apply hatching to the sections of the precast balcony unit. You will use the tools in the **2D Objects** task area.

Tools:

-  Hatching
-  Area detection
-  Convert Surface Element
-  Reshape Surface Element, Architectural Area
-  Show/Hide
-  Print Preview
-  Print


Objective:



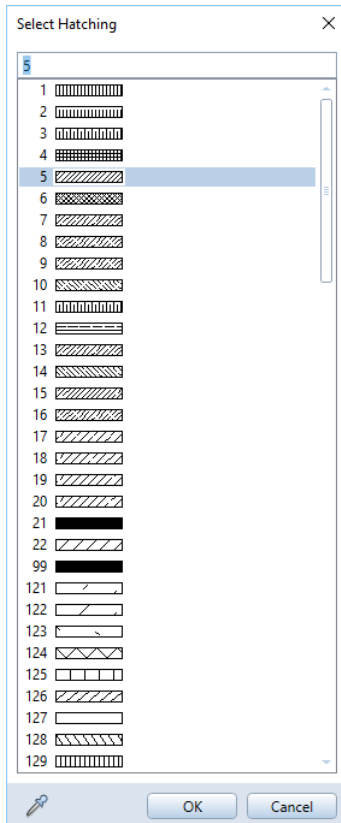
Defining and creating hatching

First, you will select a hatching style that represents reinforced concrete and apply it to the longitudinal section of the precast balcony unit.

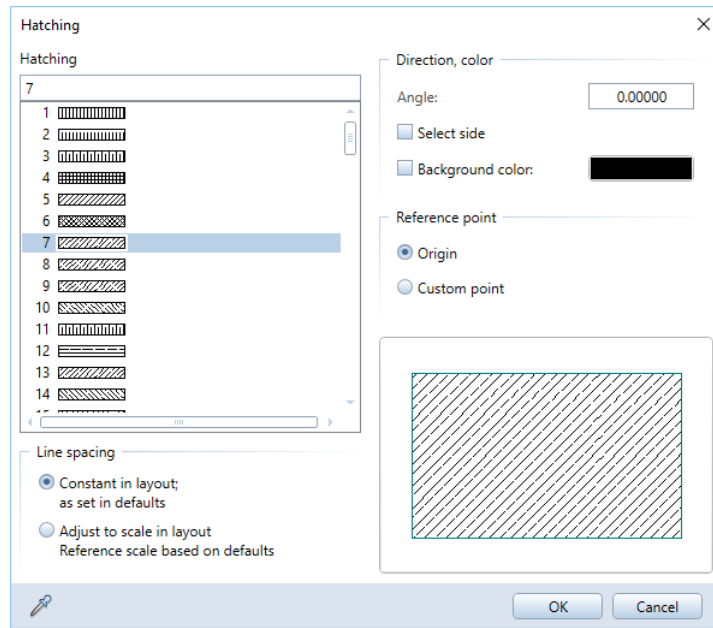
To define and create hatching

- 1 Select the  **Hatching** tool in the **2D Objects** task area.
- 2 Click the button with the hatching style on the **Hatching** Context toolbar.


Tip: When you click the hatching number on the **Hatching** Context toolbar, you can quickly select a hatching style in the following dialog box:

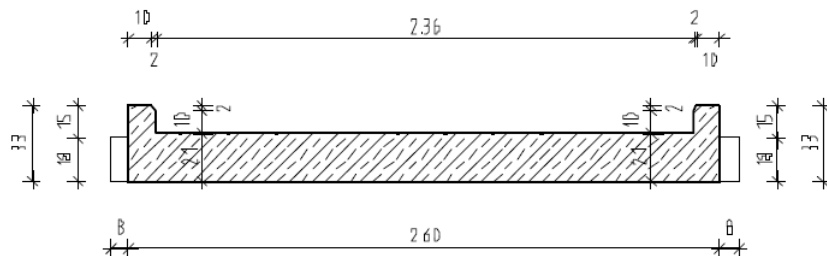


- 3 The **Hatching** dialog box opens. Select hatching style 7.
- 4 Make additional hatching settings as you require.
 - **Line spacing** area:
Constant in layout, as set in defaults
 - **Reference point** area:
Origin



Tip: To apply hatching to rectangular areas, click two diagonally opposite points. Then press ESC.

- 5 Click **OK** to confirm the dialog box.
- 6 Click  **Area detection** (input options, icon must be pressed in).
- 7 Click within the area to which you want to apply hatching. The system will detect the boundary of the area automatically.
- 8 Press ESC to finish defining the area.




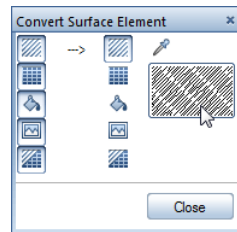
- 9 Press ESC to quit the tool.

Changing the hatching style

The next step involves replacing the hatching style for reinforced concrete with a hatching style for precast elements. All you need to do is change the hatching style.

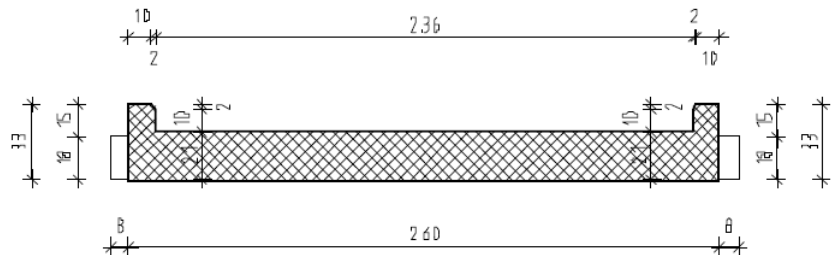
To change the hatching style

- 1 Click  **Convert Surface Element** (2D Objects task area).
- 2 The **Convert Surface Element** dialog box is displayed. Make settings as shown below and click the button with the hatching style.



Tip: To change the hatching style, you can also left-click the hatching. The program opens the **Properties** palette, where you can modify the hatching parameters (see above).

- 3 Select hatching style **6** in the **Hatching** dialog box (see "Defining and creating hatching" on page 225) and click **OK** to confirm.
- 4 *Select surface elements to convert to hatching* Click the hatching you applied to the longitudinal section.



- 5 Press **ESC** to quit the tool.

Cutting out hatching around the dimension text

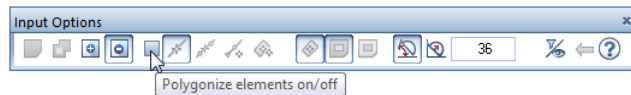
You will remove the hatching around the dimension text.

Tip: You can also apply white fills to dimension text.

To do this, select the **Apply fill to dimension text** check box in the **Properties** of the dimension line, **Text** tab.

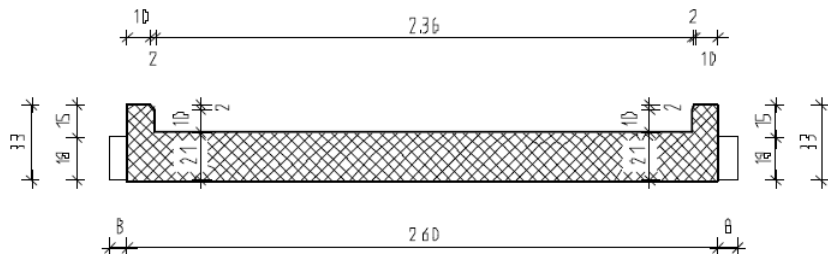
To cut out hatching around the dimension text

- 1 Open the shortcut menu of the hatching by right-clicking the hatching of the longitudinal section.
- 2 Select the **Reshape Surface Element, Architectural Area** tool.
- 3 Clear the **Polygonize elements** check box in the input options and select **Minus**.



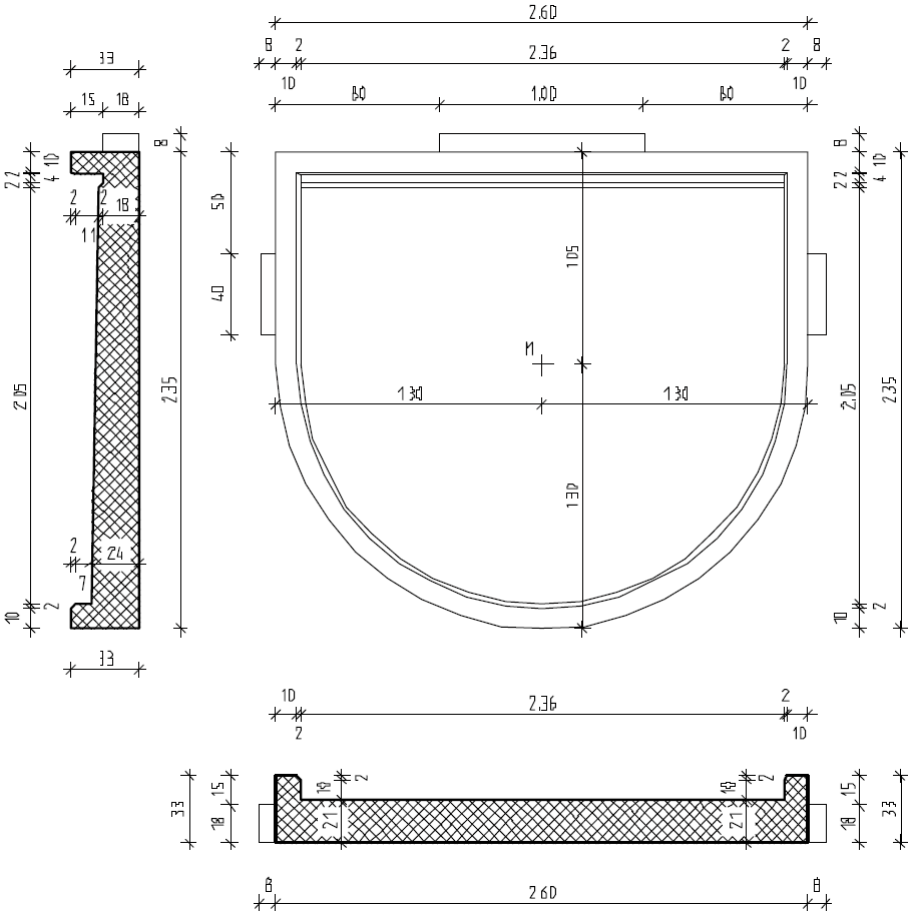
By switching off **Polygonize elements** in the input options, you automatically deactivate **Area detection**.

- 4 Enclose the area around the dimension line in a selection rectangle you open using the left mouse button and press ESC twice. The hatching disappears.
- 5 Select the hatching of the longitudinal section again and repeat step 4 for the second dimension line.






Apply Hatching to Cross-Section



Using the procedure described above, you can now apply hatching to the cross-section as shown below:



Printing the screen contents

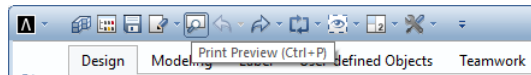
Finally, you will create a quick printout of the precast element. Using quick print, you can print intermediate results directly without having to assemble a layout first. For example, you can quickly print details or sections of floor plans if you need the current edit status on paper.

To create quick printouts, you can use the  **Print** and  **Quick Print** tools in the dropdown list of the Allplan icon on the title bar and the  **Print Preview** tool on the Quick Access Toolbar:

- Allplan uses the settings (for example, margins, header, footer, construction lines) specified in the **Print Preview** palette. There you can also set a scale and define the section you want to print.
- You can use the  **Print** tool to print the current contents of the viewport on a printer you select in advance.
- Select  **Quick Print** if you want to print the current contents of the screen without defining print settings beforehand. In this case, Allplan uses the default printer.

To print the contents of the screen

- 1 Click  **Print Preview** (Quick Access Toolbar).

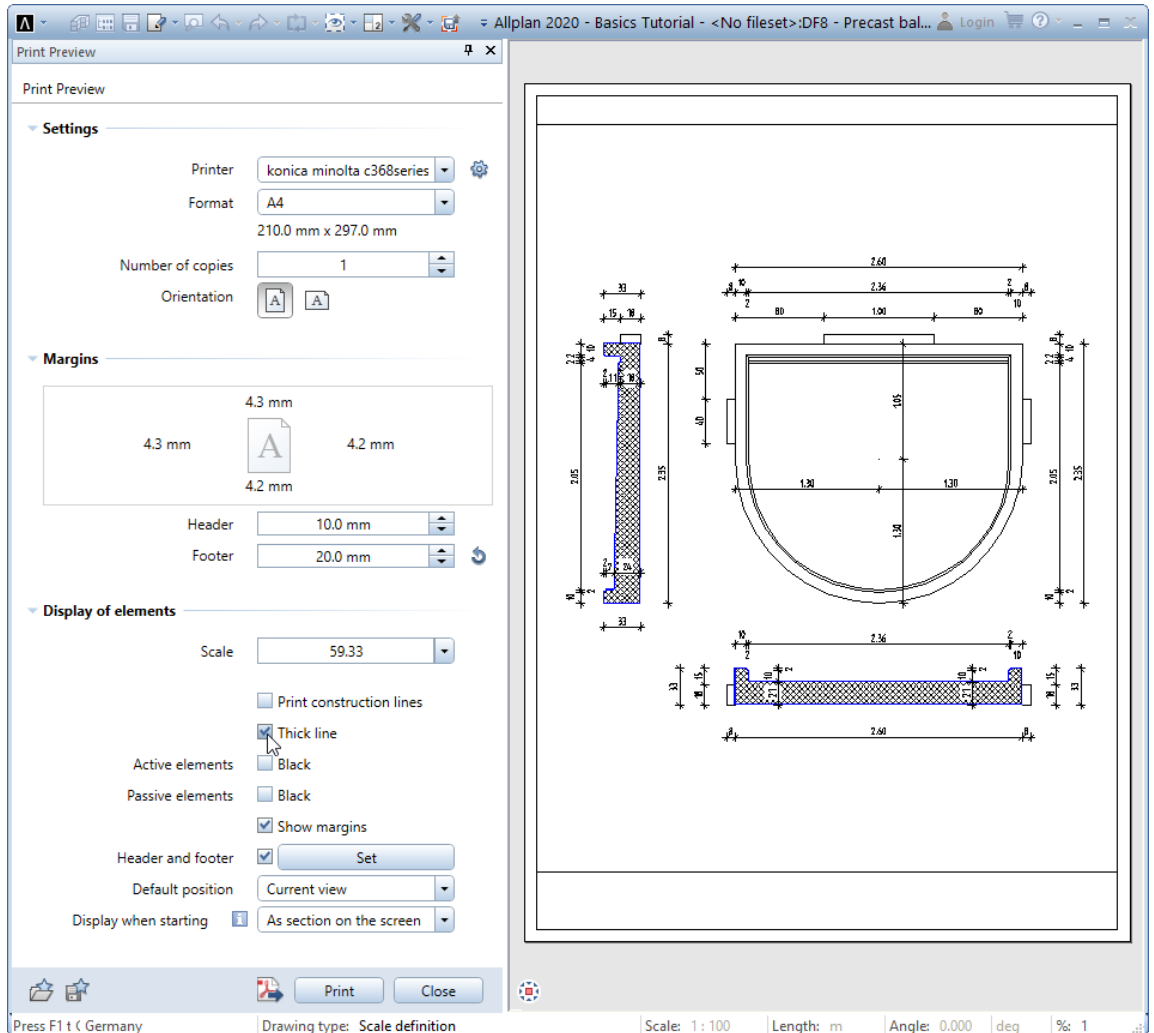


This hides all the palettes and the **Actionbar**. All that remains is the **Print Preview** palette.


- 2 Define settings for print preview in the **Settings, Margins** and **Display of elements** areas.

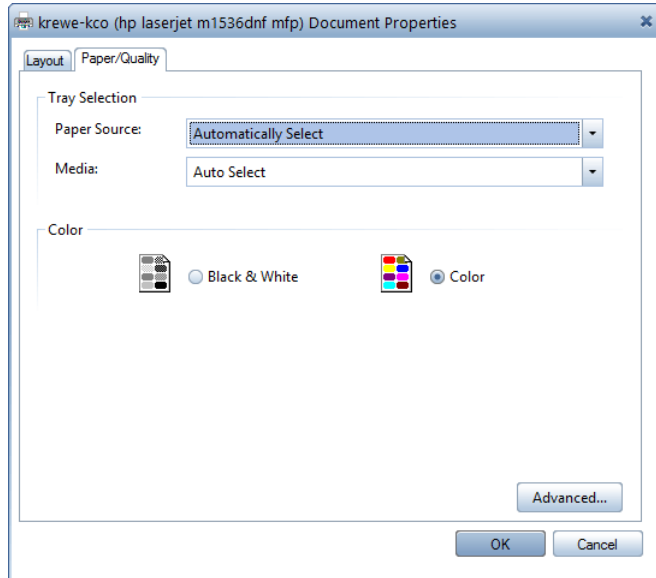
In the **Display of elements** area, select the **Thick line** option. This not only makes the different line thicknesses visible on screen but also ensures that they are printed as such.

Using the **Print construction lines** option, you can choose to include construction lines in the printout. Define the other options as you like.




- 3 If you want, you can set the scale in the **Display of elements** area.
- 4 In the **Settings** area, you can select the **Printer** if you do not want to use the default printer.

Note: Click the  **Settings** icon to define the properties (for example, paper and color options) of the selected output device or the raster driver specified.



- 5 Click **Print** at the bottom of the palette.
The program sends the document to the selected printer.
- 6 To exit print preview, click **Close** at the bottom of the palette.

Note: To create more printouts, click  **Quick Print** in the dropdown list of the **Allplan icon**. This prints using the most recent settings.

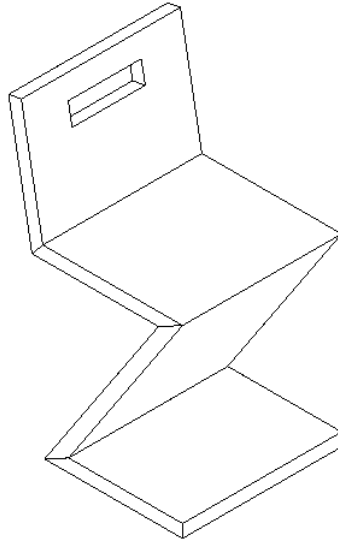
Unit 3: 3D Modeling

Unit 3 introduces the **Modeling** task. You will create a chair based on the zigzag chair designed by Gerrit T. Rietveld. You will learn

- How to create the initial elements in 3D
- How to automatically create a 3D solid based on a profile and a path
- How to define a work plane so that you can draw in a sloping plane as if you were working in plan
- How to design a box and use it to create the opening in the back of the chair

Exercise 7: Rietveld Chair

This exercise involves creating a chair based on the zigzag chair designed by Gerrit T. Rietveld.






You will use the tools provided by the **Modeling** task.

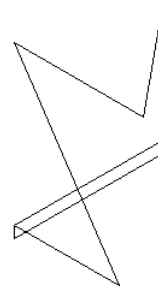
Task 1: designing the initial elements

You will start by drawing the profile and the elevation view of the chair as 3D elements in plan. After this, you will rotate these 3D elements in space.

Tools:

-  3D Rectangle
-  3D Line
-  Rotate 3D Elements

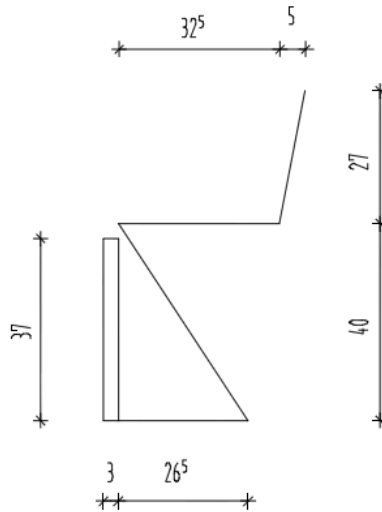
Objective:



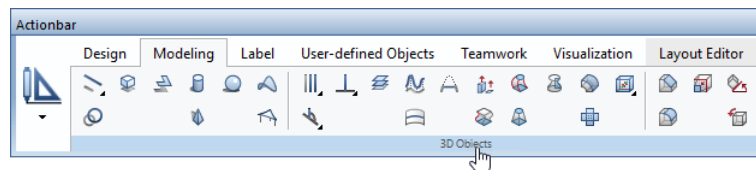
Designing the 3D elements

Start by creating the profile and elevation of the chair using the **3D Rectangle** and **3D Line** elements.


To draw the cross-section and profile of the chair in plan

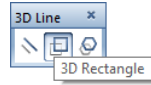





- 1 Click **Open on a Project-Specific Basis** and open an empty drawing file. Name it **Rietveld chair** and close all the other drawing files.
- 2 Go to the **Actionbar** and switch to the **Modeling** task, which you can also find in the **Draft** role.
- 3 Expand the **3D Objects** task area by double-clicking the left mouse button in the name line of this task area.

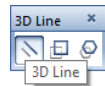




- 4 Click **3D Line** in the **3D Objects** task area.

- 5 To draw the profile of the chair, select  **3D Rectangle** on the **3D Line** Context toolbar.

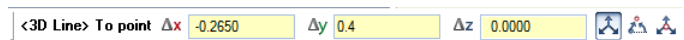


- 6 Select  **Based on diagonal line** in the input options.
- 7 Click where you want the rectangle to start.
- 8 The length of the rectangle in the x-direction is 0.03 m. Enter $\Delta x \text{ dx} = 0.03$ in the dialog line. Press the TAB key. This takes you to $\Delta y \text{ dy}$.
- 9 The height of the rectangle in the y-direction is 0.37 m. Enter $\Delta y \text{ dy} = 0.37$ in the dialog line.
- 10 $\Delta z \text{ dz}$ is set to **0.00**. Do not change this value. Press ENTER to confirm.
- 11 Click  **Zoom All** in the border of the viewport.
- 12 To create the elevation of the chair, select the  **3D Line** option on the **3D Line** Context toolbar.




- 13 Make sure  **Polyline** is selected in the input options.
- 14 Click the bottom right corner of the rectangle to define the first point of the line.
- 15 To draw the first line, select  **Delta point** in the dialog line, enter $\Delta x \text{ dx} = 0.265$ and press ENTER to confirm.
- 16 Enter the following values in the dialog line
 $\Delta x \text{ dx} = -0.265$ TAB
 $\Delta y \text{ dy} = 0.40$ ENTER


Tip: Pressing the TAB key takes you to the next data entry box in the dialog line.

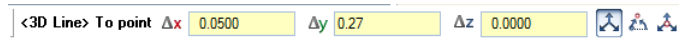



17 To draw the third line, enter  $\Delta x = 0.325$ in the dialog line and press ENTER to confirm.



18 To draw the fourth line, enter the following values in the dialog line:

 $\Delta x = 0.05$ TAB

 $\Delta y = 0.27$ ENTER



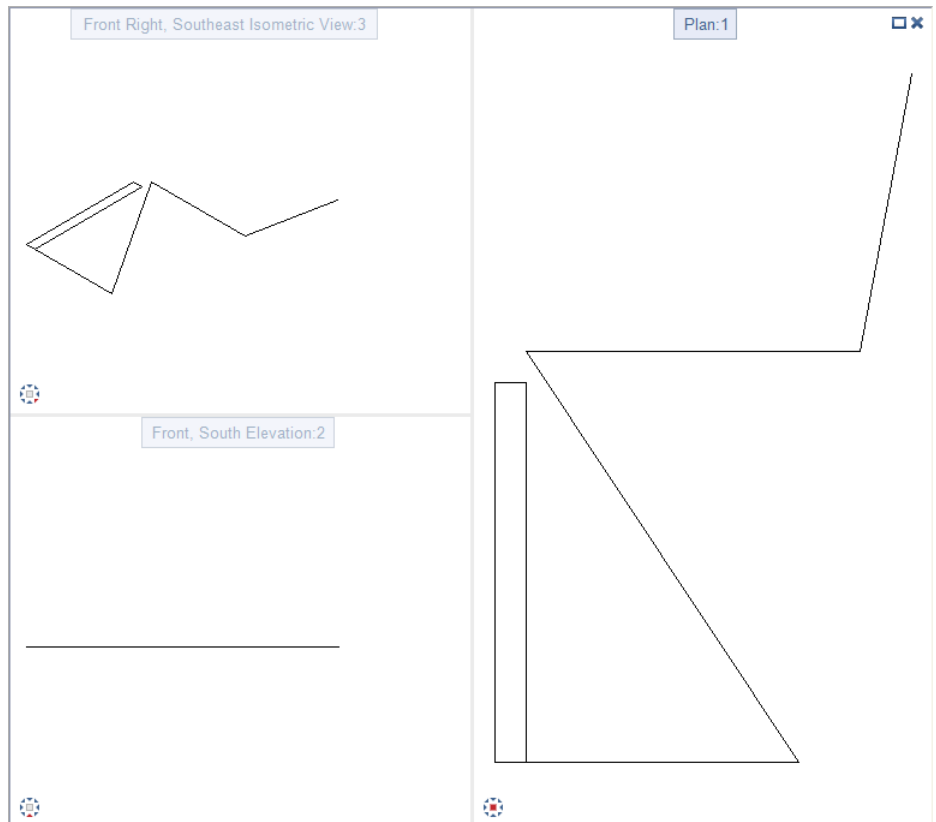
19 Press ESC twice to quit the  **3D Line** tool.

20 To get an impression of how the elements look in 3D, click  **3 Viewports** ( **Window** dropdown list on the Quick Access Toolbar).

You can now see the elements in plan, isometric and elevation view.

21 Open the **View** menu and click **Zoom All in All Viewports**.

Now your screen should look like this:




Keep these **3 viewports** for the steps that follow.

Rotating the 3D elements

The 3D elements are still "flat on the floor" (x-y plane). The next step is to rotate the 3D elements in space. The difference between this and rotating elements in 2D is that you can define an axis of rotation which lies freely in space (in 2D, you can only enter a point of rotation).

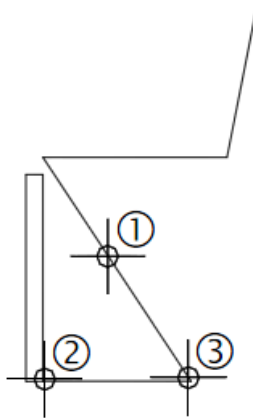
To rotate the 3D elements

➔ **Actionbar: Draft** role – **Modeling** task.

- 1 Select  **Rotate 3D Elements** (**3D Objects** task area) and click the elevation of the chair.

The element is displayed in the selection color.

- 2 Define the bottom line of the chair's elevation view as the axis of rotation. First click the left point of the line. The sequence in which you enter the points is important for defining the angle later.
- 3 Click the right point of the line. This defines the axis of rotation.



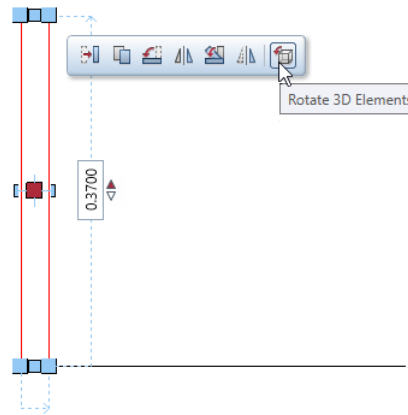
Tip: You can use the 'right hand rule' to identify the positive direction of the rotation angle. Point the thumb of your right hand in the direction of the rotation axis; your fingers will indicate the positive direction of rotation.

- 4 Rotate the elevation view upwards by 90 degrees. Enter **90** and press ENTER to confirm.

The rotated elevation view of the chair should be visible as a straight line in plan view (see below).

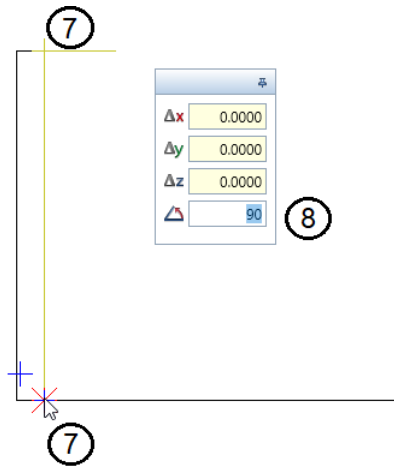
- 5 Press ESC to quit the  **Rotate 3D Elements** tool.
- 6 Next, rotate the profile of the chair downwards.

You can also find the  **Rotate 3D Elements** tool on the **direct object modification** toolbar. Click the profile and select this tool.



- 7 Define the axis of rotation as shown below. Here, too, click the point at the top first.

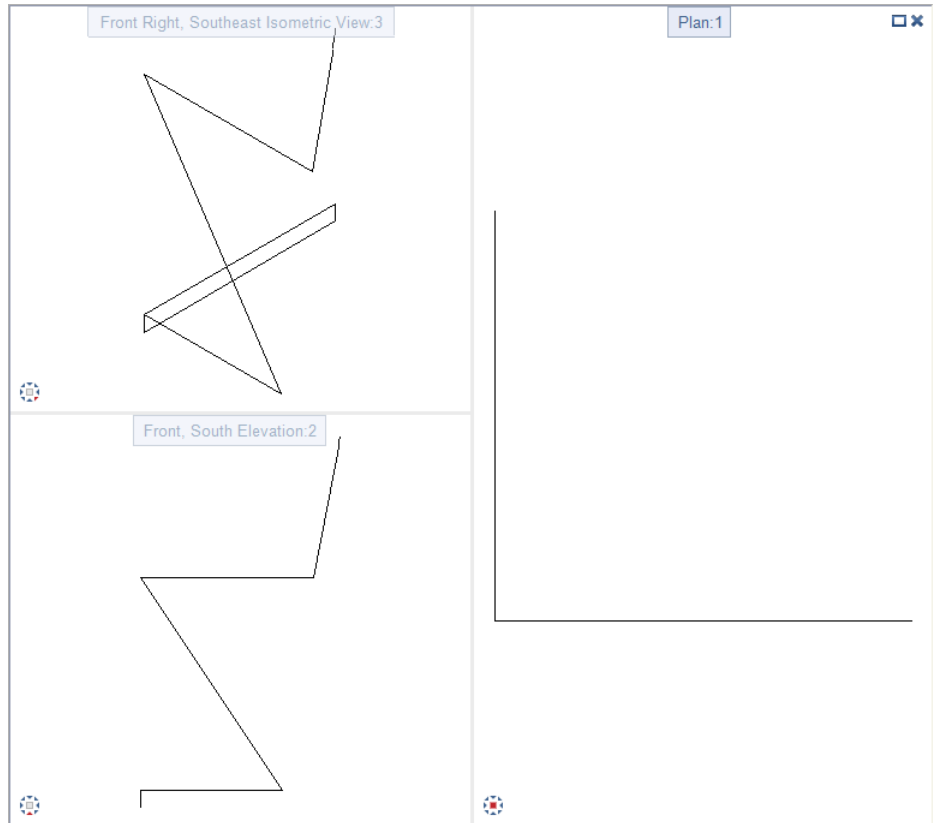
8 Enter the angle of rotation: **90**



9 Press ESC to quit **direct object modification**.

10 Press the ALT KEY to show the menu bar for a short time.
Open the **View** menu and click **Zoom All in All Viewports**.

Now your screen should look like this:

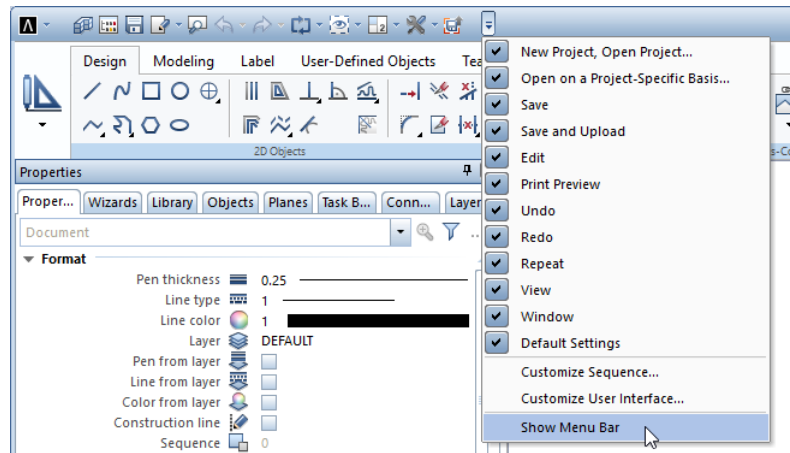


Note: When you work with the Actionbar configuration, the menu bar is hidden by default. If you want, you can show the menu bar all the time.

To show the menu bar

Tip: As you did in the previous exercise, you can show the menu bar for a short time by pressing the ALT key. As soon as you select a tool, the menu bar disappears again.

- 1 Click the dropdown list on the Quick Access Toolbar (title bar).
- 2 Click **Show menu bar**.







The menu bar is displayed below the title bar.

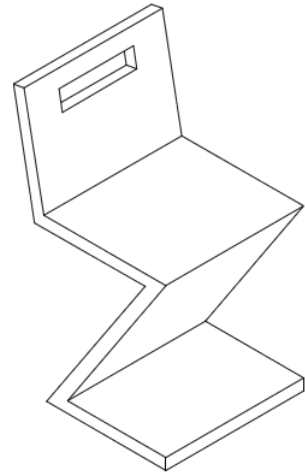
Task 2: designing the 3D solids

You will create the chair from the 3D elements. Start by designing the opening in the back of the chair as a 3D solid (box). You will then subtract this opening from the back of the chair.

Tools:

-  Extrude Along Path
-  Work Plane
-  Box
-  Subtract and Remove Solid


Objective:



Extruding along a path

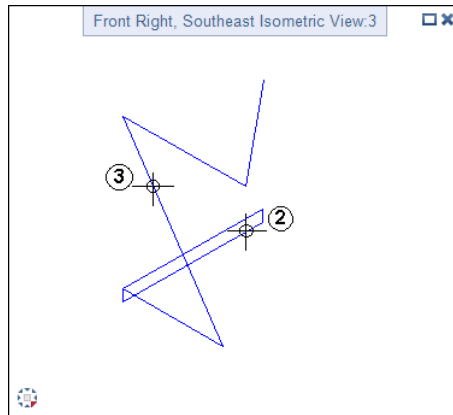
The next step is to create the chair using the **Extrude Along Path** tool. The profile you want to extrude is the profile of the chair. The elevation of the chair will serve as the path.

To extrude the elevation of the chair along a path

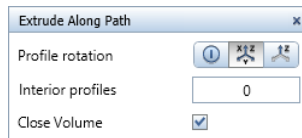
- ➔ 3 Viewports are still open.
- ➔ Actionbar: Draft role - Modeling task.
- 1 Click  **Extrude Along Path** (3D Objects task area).
- 2 *Select profile to extrude*
Click the profile of the chair in isometric view.

3 *Select path*

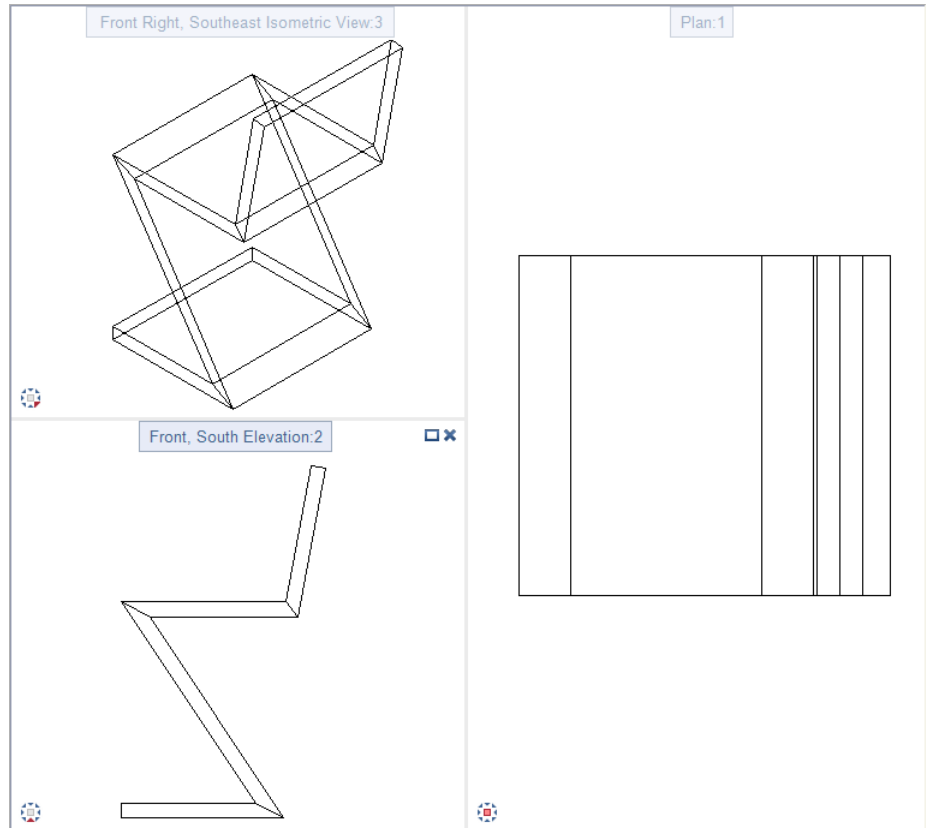
Click the elevation of the chair in isometric view.

4 *Set parameters, press ESC to confirm*

Check the settings in the **Extrude Along Path** dialog box and press ESC to confirm.

5 Press the ALT KEY to show the menu bar for a short time. Open the **View** menu and click **Zoom All in All Viewports**.

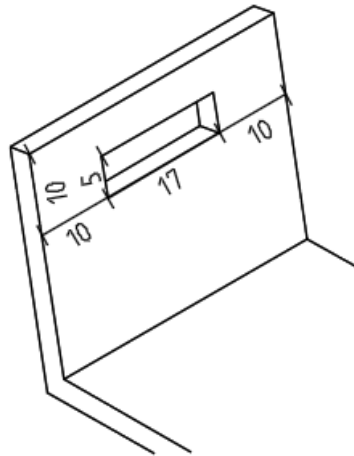
Now your screen should look like this:




6 Press ESC to quit the  **Extrude Along Path** tool.

Defining a work plane and creating a 3D box

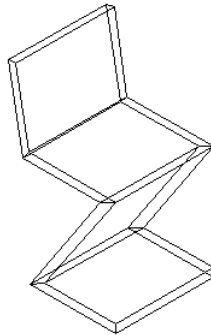
The chair is still missing the opening in its back. You will start by creating it as a box. To make it easier for you to position the box in the sloping back of the chair, you will define a work plane (= user-defined coordinate system) whose x-axis and y-axis are parallel to the edges of the back of the chair. This way, you can draw in the work plane as if you were working in plan.





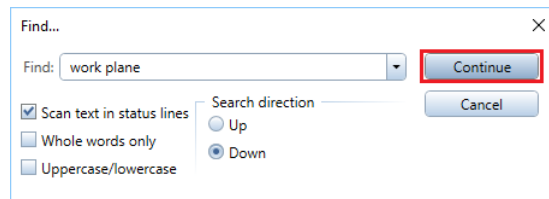
To define the work plane and create a 3D box


- 3 Viewports are open.
- Actionbar: **Draft** role – **Modeling** task.
 - 1 Click in the viewport displaying the chair in plan.
 - 2 To enter the work plane, display the chair in isometric view. Click  **Rear, Left Isometric View**.

The result should look like this:



- 3 The following steps require the  **Work Plane** tool. To get to this tool quickly, you will use the search function of the **Actionbar**. To do this, click  in the top right corner of the **Actionbar**.
- 4 Enter **work plane** in the **Find...** dialog box and click **Continue**.




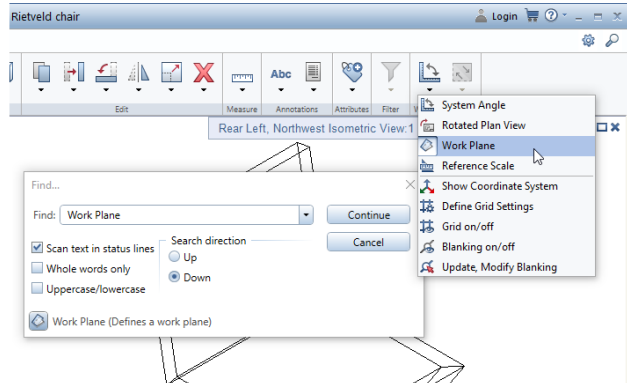
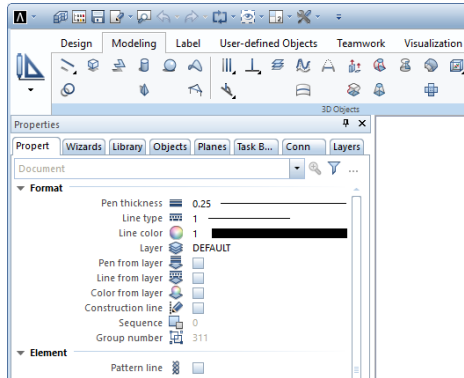
The **Work Environment** task area displays the  **Work Plane** tool.

5 There are two ways to select the  **Work Plane** tool:

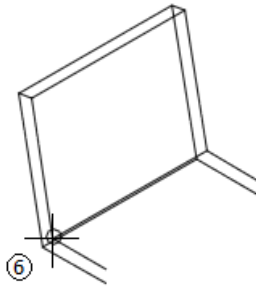
- Click the tool in the **Work Environment** task area.

Or

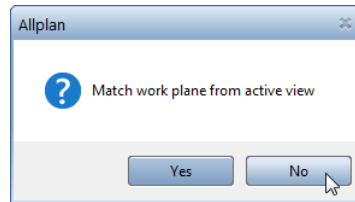
- Click the  **Work Plane (Defines a work plane)** icon in the lower part of the **Find...** dialog box.



6 To define the origin of the work plane, click the bottom left corner of the back of the chair (see below).

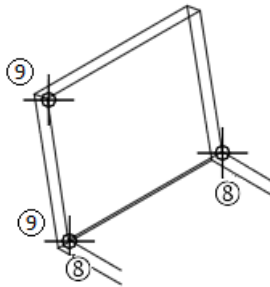


- 7 Choose **No** at the following prompt asking whether you want to use the current view as the work plane.



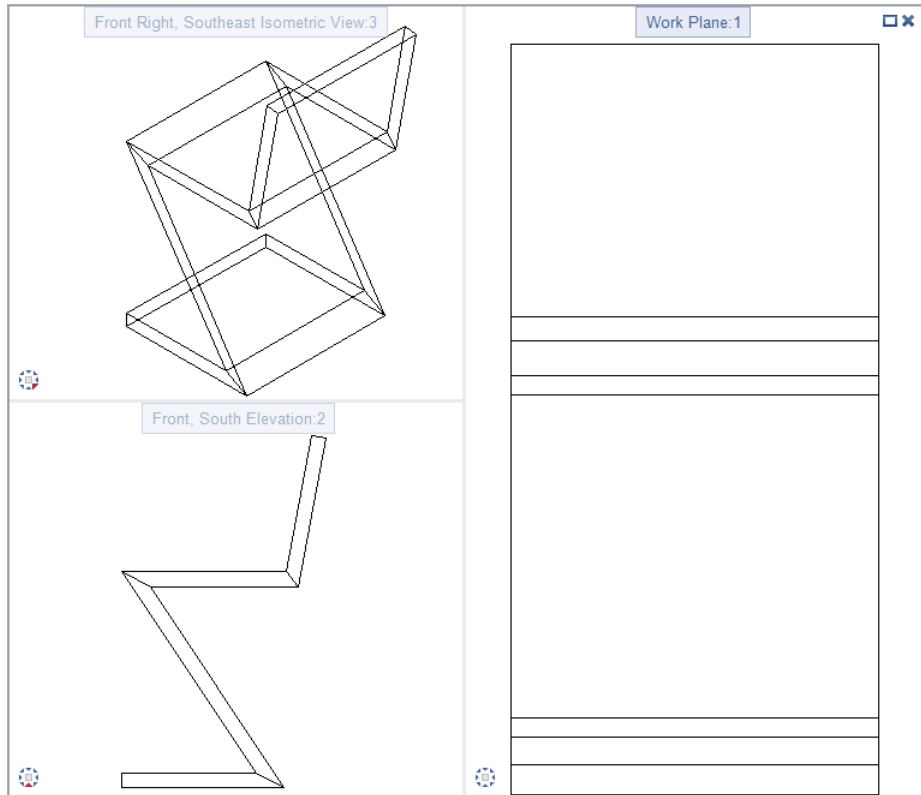
Define the work plane by entering four points.

- 8 To define the x-axis, click the two end points of the bottom edge of the chair (see below). As the positive x-axis is to be to the right, click the point on the left first.
- 9 To define the y-axis, click the two end points of the rear left edge of the chair (see below). As the positive y-axis is to be upwards, click the bottom point first.




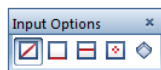
The z-axis, which is generated automatically in the origin, is perpendicular to the x-y plane.

Your screen should now look like this:



Now all the entries you make apply to the axes of the defined work plane: You can enter the values defining the box as if you were working in a 2D floor plan.

- 10 To draw the box, click  **Box** (3D Objects task area).
- 11 Check that **Based on diagonal line** is active in the input options. If it isn't, activate it now.





Always work in the viewport on the right!


- 12 Make sure that  **Delta point** is active in the dialog line.

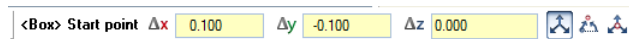
- 13 Point to the point at top left to define the reference point for the corner of the box. You can see this point in the other two view-ports too.



- 14  **Delta point** is active.
Now enter the offset of the corner in the dialog line:


 dx = 0.1

 dy = -0.1

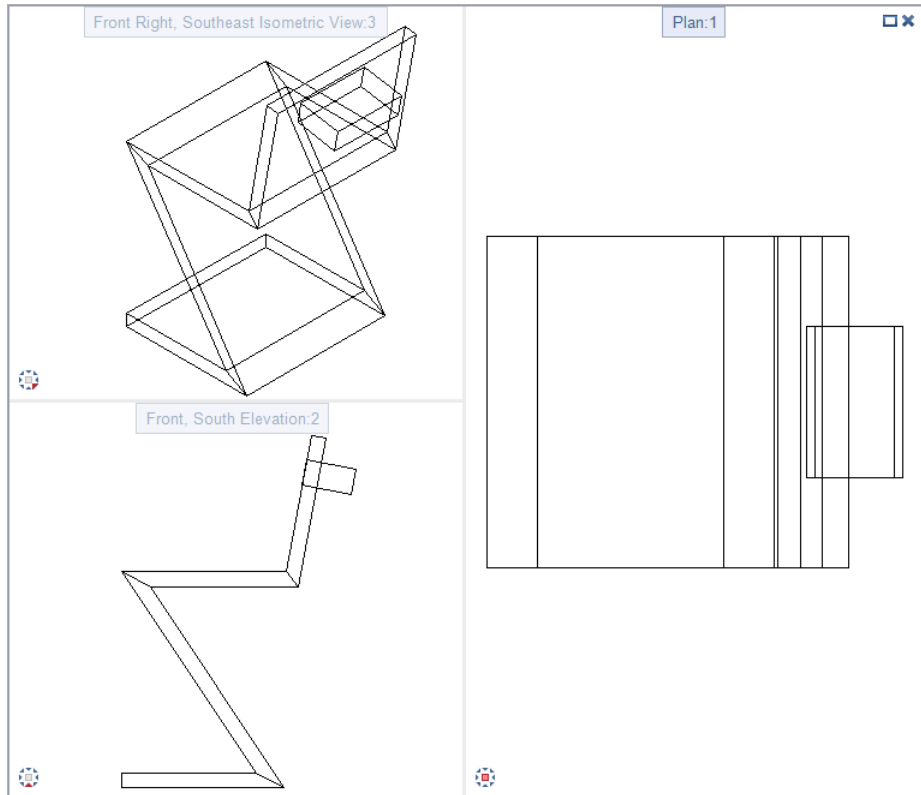


Press ENTER to confirm.

This defines the corner of the box.

- 15 Enter dx = **0.17** for the length of the opening and dy = **0.05** for its width. Then press ENTER to confirm.
- 16 To define the height of the box in the z-direction, enter a value that is larger than the thickness of the back of the chair. Enter -**0.10** for the height. You have drawn the box.
- 17 Click  **Plan** to return to the normal work plane.

Now your screen should look like this:




18 Press ESC to quit the  **Box** tool.

Creating a cutaway

To finish, you will remove the volume of the box you have just created from the 3D element. The box will be deleted in the process.

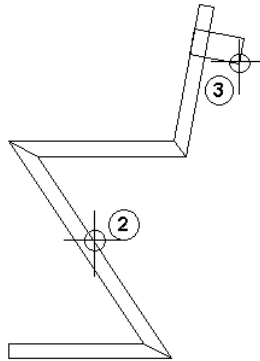
To add a cutaway

➔ **Actionbar: Draft** role - **Modeling** task.

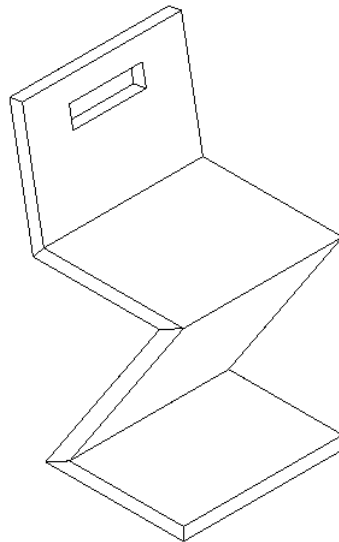
- 1 To create the cutaway in the back of the chair and to delete the box, go to the **Boolean Operators** task area and click  **Subtract and Remove Solid**.

Tip: Expand the **Boolean Operators** task area. Do you still know how to do this? Double-click the left mouse button within the name line of the task area.

- 2 *Click 1st solid*
Click the chair; this is the solid in which you want to create the cutaway.
- 3 *Select solids, right-click to confirm*
Click the box; this is the (only) solid you want to subtract from the first solid. Right-click to confirm.



This creates the cutaway; the resulting chair should look like this (view type is set to **Hidden** at bottom right in the border of the viewport):



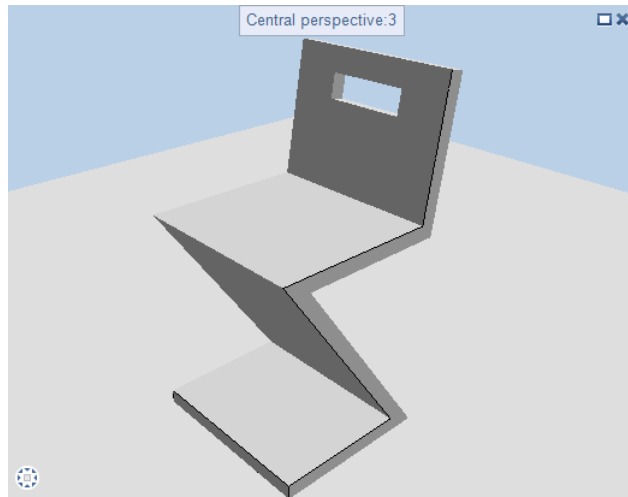
A note on design check, color and texture

To check the design

- 1 Press the F4 key.

A viewport of the **Animation** view type opens, showing the chair.



 **Navigation Mode** is active.



See also: You can find more information on how to use the mouse in animation in the help for Allplan. See "Sphere mode, camera mode".

- 2 Press and hold down one of the mouse buttons, then drag: You move around the virtual model in **sphere mode**, which is set by default.
Pressing the CTRL key at the same time switches to **camera mode**.
- 3 Experiment with the navigation modes and start trying things out on your own.

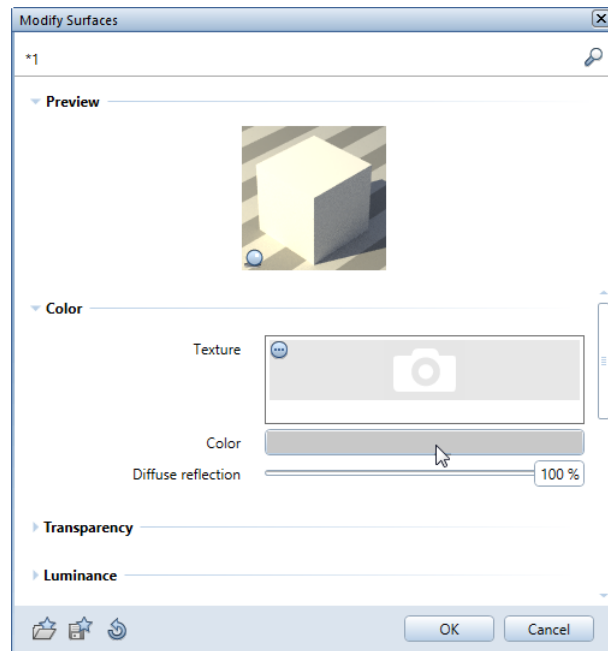
- 4 The chair's color is boring? What about red?

 **Navigation Mode** is still active in the animation window. Right-click the chair; the shortcut menu opens. Click  **Set Surface**.

The **Modify Surfaces** palette opens.

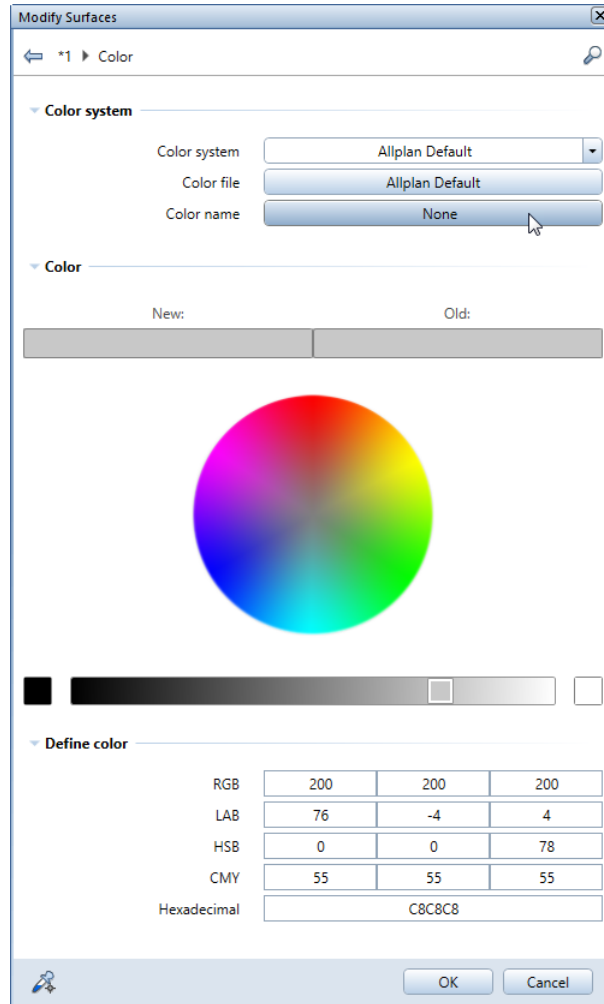
You can check and change the surface properties of the chair.

- 5 Click the button in the **Color** area.

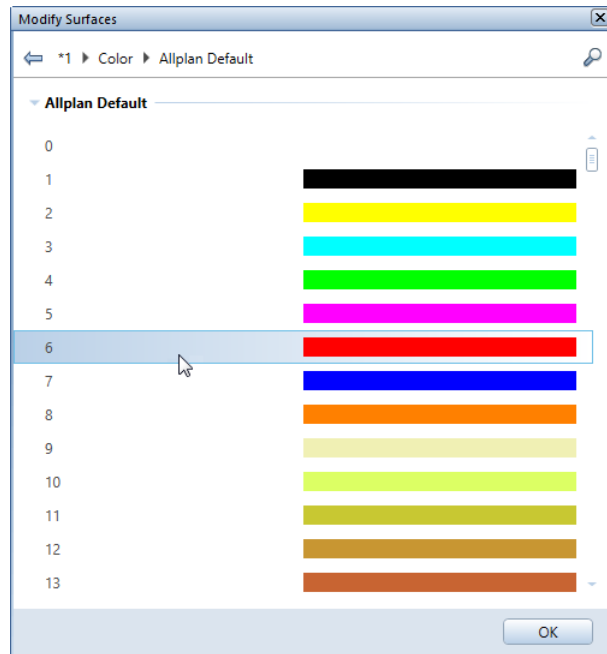


The palette shows the current color of the chair.

6 In the **Color system** area, click the button beside **Color name**.



7 Select a color by clicking it.



The palette shows the old color and the new color.

Tip: You can also select a color in the color circle, use the slide bar or enter values in the **Define color** area.

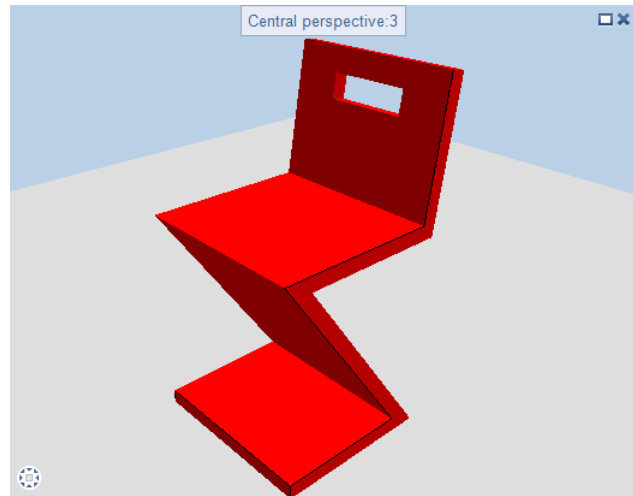



- 8 Click **OK** to confirm the palette.

You can now customize the surface to your needs by defining more properties.

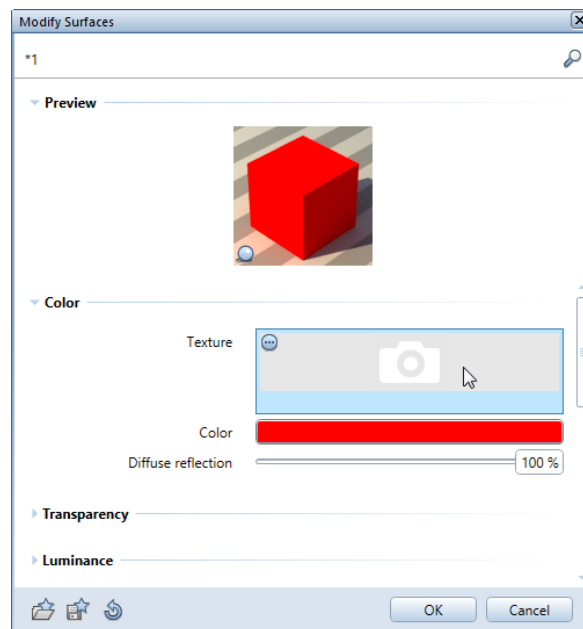
- 9 Finally, click **OK** to confirm the palette.

The chair appears in the selected color.

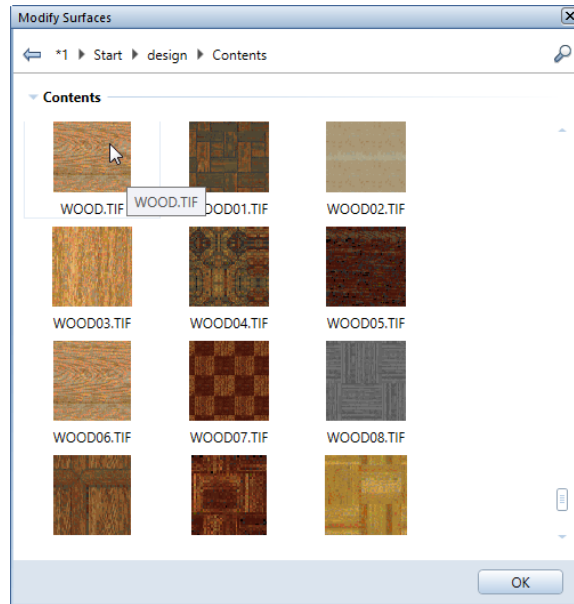


- 10 Or what about the wood grain? Would you like to see it? Right-click the chair in the animation window and select  **Set Surface** on the shortcut menu.


In the **Modify Surfaces** palette, go to the **Color** area and click the button beside **Texture**.

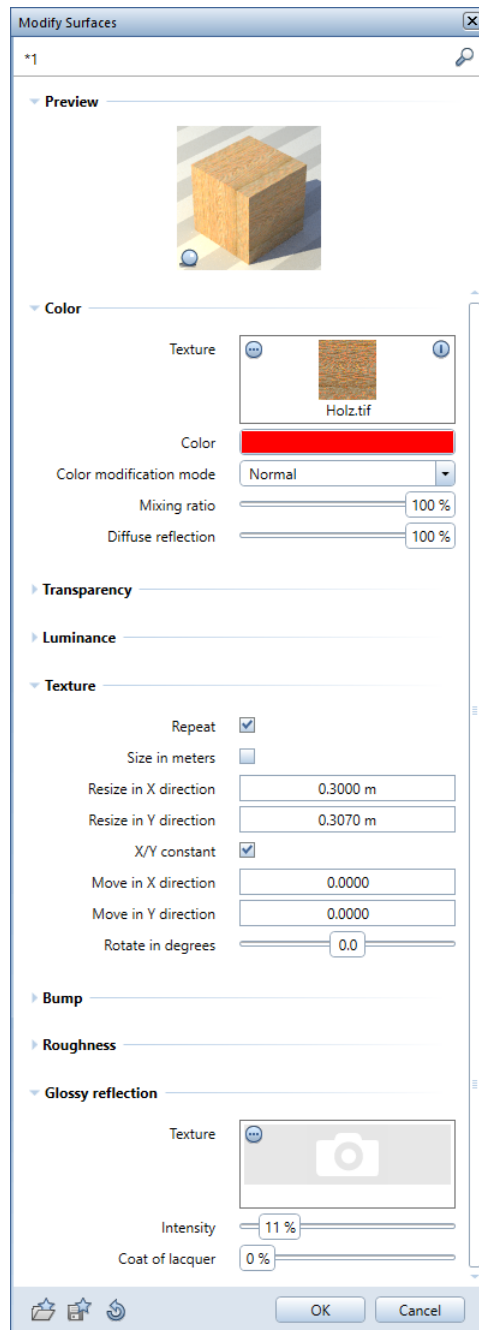


- 11 Open the contents in the design folder in the office standard. In order to do this, click the **Office** folder followed by the **Contents** folder.
- 12 Select a texture and click **OK** to confirm.

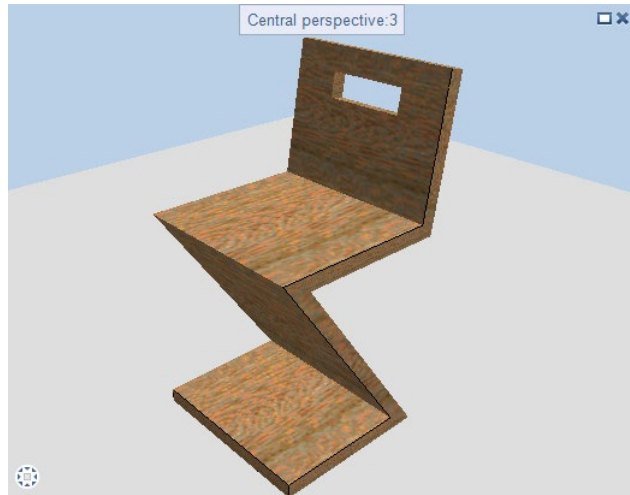


- 13 Continue to modify the surface. Define settings that are like those shown below. When you have finished, click **OK** to confirm.

Tip: You can find the  **Save as a favorite** tool at the bottom of the **Modify surfaces** palette. Using this tool, you can save the surface with a new name (for example, `wood_chair.surf`).



The result might look like this:



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