Allplan 2015 Architecture Tutorial

Architecture Tutorial

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Architecture Tutorial Welcome

Welcome

Welcome to Allplan 2015, the high-performance CAD program for architects.

In this tutorial workbook you will learn about the most important functions in Allplan 2015's main modules.

You will find that within a short time, you will be in a position to use Allplan 2015 effectively in your daily work.

This chapter covers the following:

- Content of this tutorial
- Documentation for Allplan 2015
- Additional help on Allplan 2015
- Where to turn for training, coaching and project support

2 Introduction Allplan 2015

Introduction

The Architecture Tutorial expands on the Basics Tutorial. Based on six examples, the Basic Tutorial explains the principles of drafting and designing in 2D. In addition, you learn how to get started in 3D modeling.

The aim of the Architecture Tutorial is to guide you with easy-to-follow steps from the planning of a residential building, through construction in 3D to analyses of the building data. The Architecture Tutorial consists of 17 exercises, which are divided into nine units.

This tutorial will provide you with a sound introduction to Allplan 2015. As it only touches on the possibilities of some of the tools, please consult – especially later when you work with Allplan 2015 – the F1 help as an important source of information.

You can download two project templates from Allplan Connect:

- A project template with the structures and settings (but not the design!) used in this tutorial.
- A project template with the finished project including all the data so that you can compare the model you created yourself with the model provided.

To find out how to install the project templates, see "Exercise 1: Installing the Project Template and Starting Allplan (on page 8)". To find out how to download the project templates from Allplan Connect, see the section "Project templates on the Internet (on page 476)" in the appendix.

This tutorial assumes that you have a working knowledge of Microsoft® Windows® programs. Basic CAD-knowledge is helpful; however, this tutorial will provide both the experienced CAD user as well as newcomers to CAD with a solid foundation in the methods employed by Allplan 2015.

We would like to express our gratitude to the AIC architectural practice in Schöneich for providing us with one of their projects for this tutorial.

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Sources of information

The Allplan documentation consists of the following:

- 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 function by pressing the F1 key, or activate Help on the Default toolbar 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 as well as 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 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 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/modules in Allplan in detail. The areas covered include data exchange, system administration, geodesy modules, presentation modules, 3D modeling etc. As a Service-plus member you can download these guides as PDF files in the Learn Documents area of Allplan Connect (http://connect.allplan.com).

4 Sources of information Allplan 2015

Additional help

Tips on efficient usage

The ? menu includes Tips for efficient usage. This topic provides 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 e-mail to:

Dokumentation@nemetschek.de

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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. Nemetschek's 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 wish 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 encompass not only Allplan issues but include analysis and optimization of processes and project organization.

For more detailed information on the current training program, please consult our online seminar guide, which can be found on our homepage (http://www.nemetschek-training.de).

You can also contact us for full details

Phone: 0180 1 750000 Fax: 0180 1 750001

Feedback on the documentation

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 on the manuals and help.

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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Email: Dokumentation@nemetschek.de

Unit 1: Basics

You will start this unit by installing the Allplan 2015 Architecture Tutorial project template. Then you will start Allplan, create a new project and make a few basic settings.

The Allplan 2015 Architecture Tutorial project template, which you can download from Allplan Connect, comes with a building structure consisting of structural levels and assigned drawing files. It includes predefined views and sections, reports and four print sets. Using these print sets, you can control which layers are visible.

By creating the project based on the project template, you can start designing the building at once.

If you want to create the project along with the building structure and print sets yourself, you can find a detailed description of the necessary steps in the appendix (on page 429) to this tutorial. The appendix also includes information on various interesting topics, such as layers, ProjectPilot, palette configuration, building structure and many more.

If you do not want to work through the entire tutorial step by step, you can download the Allplan 2015 Architecture Tutorial (with model) project template from Allplan Connect. This project template includes the data of the finished project with all the drawing files, views and sections as well as various reports.

Look in the appendix for information on how to down-load project templates. Refer to the section "Project templates on the Internet (on page 476)".

At the end of this unit, you will find a short troubleshooting section you may find helpful.

Exercise 1: Installing the Project Template and Starting Allplan

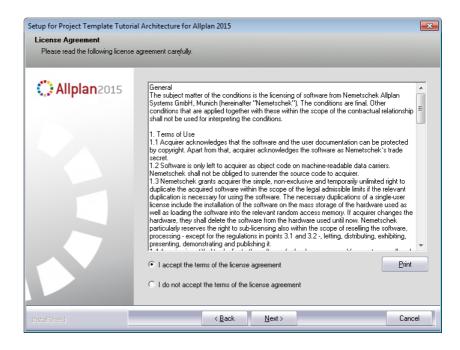
Installing the project template

After having installed and configured Allplan 2015, you can install the Architecture Tutorial project template (with or without the model).

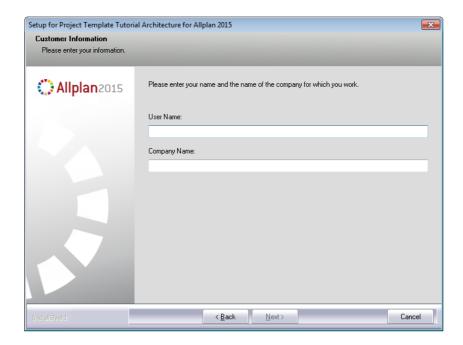
To install the project template

- ➡ Allplan 2015 must be installed, registered and correctly configured. After having installed Allplan, you need to start it at least once and check whether it works properly.
- ➤ You downloaded the Allplan 2015 Architecture Tutorial project template from Allplan Connect to a folder of your choice. After this, you extracted it.
- 1 Close all running applications.
- 2 Double-click the extracted application and click Run in the dialog box.
- 3 Click Next > to acknowledge the Welcome screen.

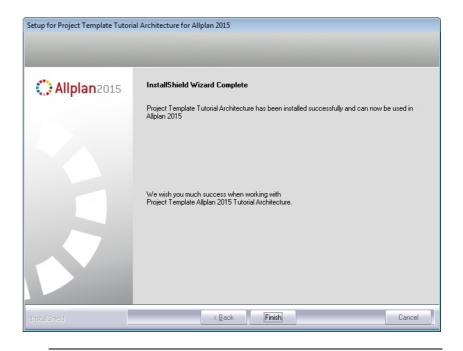
4 Read the license agreement carefully and accept it. Click Next >.



5 Enter your name and that of your company. Click Next > to confirm.



6 Finally, click Finish.



Starting Allplan and creating the project

You installed Allplan 2015 and the project template on your computer.

Start Allplan 2015 and create the project.

To start Allplan and use the project template

1 Open the Windows start menu and point to All programs, Nemetschek, Allplan 2015 and click Allplan 2015.

Or

Double-click Allplan 2015 on the desktop.

2 After having started Allplan 2015, you can create a project straight from the Welcome Screen. Click the corresponding tool.



If you have switched off the welcome screen, click New Project, Open Project on the Default toolbar. The New Project, Open Project dialog box opens. Click New Project.

3 Enter Architecture Tutorial for the project name, select the Allplan 2015 Architecture Tutorial project template and click Finish.

The project opens.

Basic settings

Settings in the Tools palette

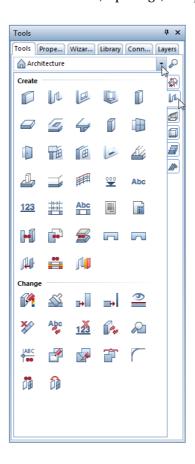
For the first exercises, you will use the tools in the Basic: Walls, Openings, Components module. Select this module in the Tools palette.

To adjust the settings in the Tools palette for the exercises that follow

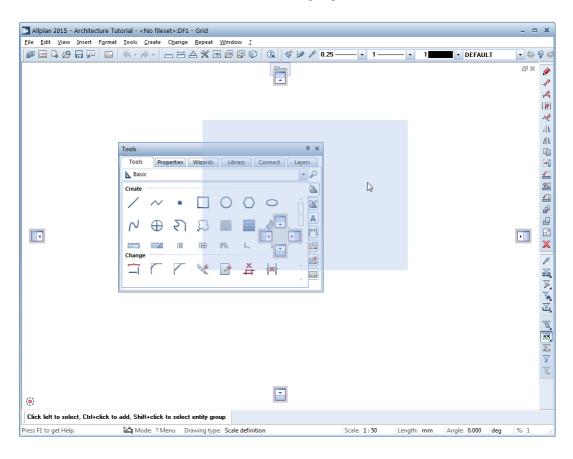
- 1 Select the Tools tab in the palette.
- 2 Select the Architecture family in the list box.
- 3 Select the Basic: Walls, Openings, Components module on the right side of the palette.

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The program shows the tools in the Create and Change areas of the Basic: Walls, Openings, Components module.

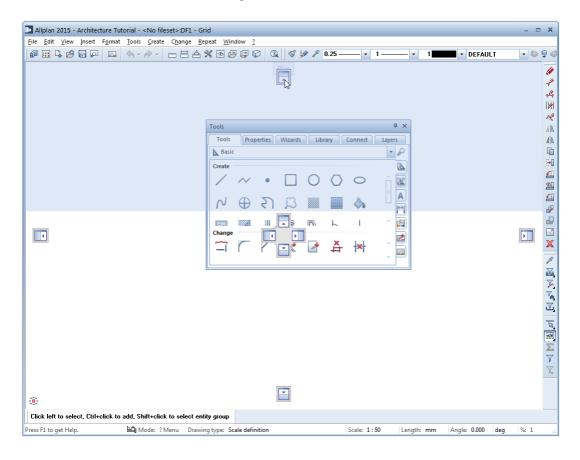


4 You can arrange the palettes in different places on screen. To reposition the palette window, click its top border with the left mouse button and keep it pressed down:



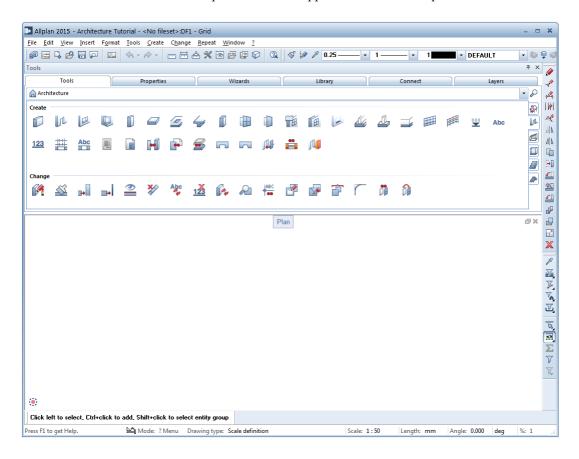
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5 Drag the window to one of the positions displayed. An example:



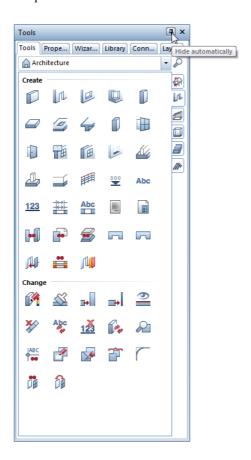
6 Release the left mouse button.

The palette window appears at the selected position.



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Note: You can use Hide automatically to show $(\mbox{$\mathbb B$})$ and hide $(\mbox{$\mathbb B$})$ the palettes.



7 Position the palette window as you need.

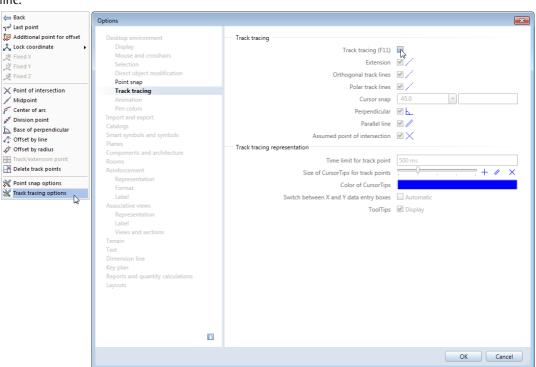
Track tracing

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 In the Tools palette, click / Line (Draft module Create area).
- 2 Click in the workspace with the right mouse button and select **X** Track tracing options on the shortcut menu.
- 3 Switch Track tracing off.

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.



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

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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 (several times if necessary).
 Click IIndo.
- ... 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 **X** Zoom All (viewport toolbar).
 - Click 🚇 Plan.
- ... the workspace is suddenly divided into a series of different viewports?

On the Window menu, click 1 Viewport.

ments in question are selected.

Tip: Check whether the relevant layer is set so that it is visible.

... specific kinds of elements such as text or hatching do not appear in the workspace?
 Click Show/Hide (Default toolbar) and check that the ele-

Unit 2: Building Design

In order to work through the exercises in this unit, you need the General: Roofs, Planes, Sections, Special: Walls, Openings, Components and Basic: Walls, Openings, Components modules. Check the palettes to see whether you have licensed these modules.

In this unit, you will draw a residential building in 3D. Allplan will generate the three-dimensional building model as you work.

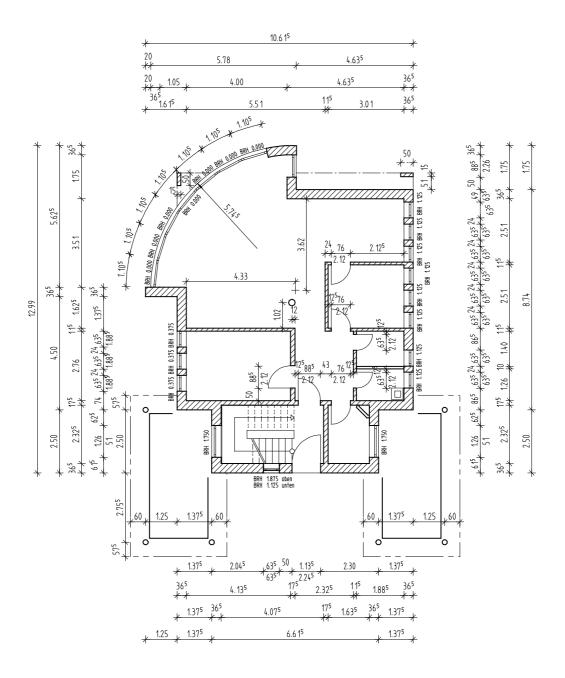
You will create the ground floor, the upper floor and the basement one after the other.

This unit teaches you how to handle the most important tools (wall, column, door, window and slab) in the architecture modules. You will also find out how to apply SmartParts and smart symbols and learn how to dimension the floor plan.

You should work your way through the exercises step by step.

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Exercise 2: Ground Floor



Settings

When you work with the architectural modules, there are additional settings that you need to bear in mind – the pen used for component hatching, for example.

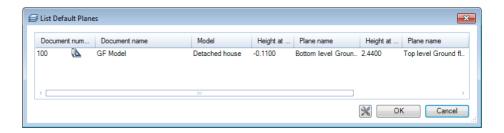
You can find these settings in the Options on the Components and architecture page in the Architectural settings across modules area.

To define basic settings

- **⇒** The Architectural Tutorial project is open.
- **○ X** Options (Default toolbar), Desktop environment page, General area: Unit of length is set to m.
- **⇒** The Tools palette shows the General: Roofs, Planes, Sections module in the Architecture family.
- 1 Select Deen on a Project-Specific Basis.
 - The Building structure tab is open.
- 2 Make drawing file 100 Ground floor, model current and close all the others.
- 3 Check the height of the drawing file. Click List Default Planes.

The List Default Planes dialog box opens. Check the height settings of drawing file 100:

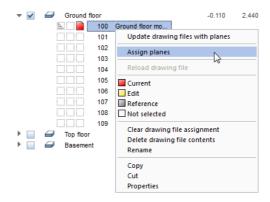
- Height at bottom: -0.1100 Plane name: Bottom level of building
- Height at top: 2.4400
 Plane name: Top level of building



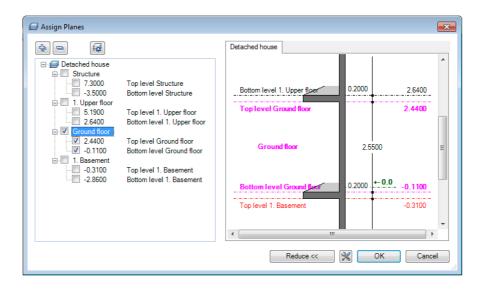
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4 Close the List Default Planes dialog box.

Note: If the height settings of the drawing file are not correct, click Open on a Project-Specific Basis and select the Building structure tab. Open the shortcut menu of drawing file 100 and click Assign planes.



Make height settings for the ground floor in the Assign planes dialog box.

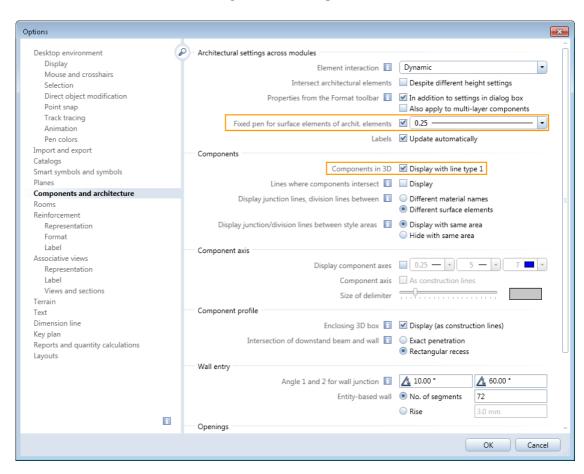


Click OK to close the Assign planes dialog box.

Click **OK** to confirm the **Behavior of drawing files** dialog box without activating an option as the drawing file is still empty.

Close the Open on a project-specific basis: drawing files from fileset/building structure dialog box.

- 5 Click **3** Options and select the Components and architecture page.
- 6 In the Architectural settings across modules area, select the Fixed pen for surface elements of archit. elements option and select the hatching pen: 1 0.25.
- 7 In addition, select the Display components with line type 1 in 3D option in the Components area.



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- 8 Click **OK** to close the options.
- 9 Check the Reference Scale (on the View menu or in the status bar). It should be set at 1:100.

Walls

Note: The following sections cover the essentials for drawing walls. If you want to skip these sections and just start drawing, continue as described in "Straight exterior walls (on page 31)"

General information

The Wall tool can be used to draw different types of walls:

- Straight Walls
 The approach is the same as with lines in the Draft module.
- Rectangular Walls

 This lets you create four straight walls in a single operation the approach is the same as with rectangles in the Draft module.
- Curved Walls
 A polyline is used to approximate the circle: this results in short, straight wall sections that can be addressed as a single entity.
- Circular Walls
 Use this to draw walls as you would a circle in the Draft module.
 You can enter full circles and arcs. A polyline is used to approximate the circle.
- - Inscribed means that the start and end walls have half the length of a segment. The division is at a tangent to the circle that you entered when defining the geometric outline.

Circumscribed means that the start and end segments have the length of a normal section. The division is on a secant with the circle that you entered when you defined the geometric outline.

Entity-Based Walls

This draws walls based on 2D entities (e.g., lines, polylines, splines) or composite elements. The wall is drawn along the donor element. The donor element itself is not affected by the operation.

• Spline-Based Walls

Use this to draw walls as you would a spline in the Draft module.

Clicking Properties displays a dialog box in which you can define the walls more precisely. Enter values for the height of the wall, its thickness and elevation. You can also define additional properties such as the building trade, material, priority rating, element interaction, format properties (pen, line, color) and surface properties (hatching style, pattern or fill).

Previews keep you informed about the wall structure, showing how the wall looks in the standard views and in the Wireframe, Hidden and Animation view types.

Note: To save time, define the materials and other attributes when you enter the walls. Allplan uses the information you define here for subsequent analyses and reports based on the building model. Of course, you can also assign materials and attributes at a later time. Materials can be transferred directly from applications used for tendering, awarding and invoicing such as Nemetschek's Allplan BCM.

Walls are generally drawn like the base 2D entities. For example, you draw a straight wall just as you would a straight line – all the construction aids available when you draw a line are also available when drawing a wall.

The only other thing you need to do is define the wall's offset direction and enter Properties for it in the dialog box. The standard approach is to define the height of the wall using reference planes: Define the height of the default reference planes once. All the walls associated with these planes are automatically correct.

Other wall types

The wall types listed above are complemented by walls with a freeform outline or cross-section (profile walls). Moreover, various au28 Walls Allplan 2015

tomation tools are available that you can use to generate single- or multi-tier walls on the basis of lines (sketches, for example), parallel lines (e.g., 2D outlines) or based on rooms that you have already defined, as well as 2D floor plans obtained from scans of drawings. This way, you can quickly convert a 2D design to a complex 3D building model.

Component axis

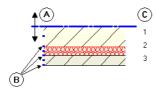
Components are entered along their component axis. The wall's direction of extension depends on the position of the component axis, the direction in which the wall is entered and the position of the first construction layer in the wall.

Click Rotate about axis (Wall Context toolbar) to change the wall's direction of extension.

You can position the component axis as follows:

- Centered in or on the sides of the entire component (wall as a whole)
- Centered in or on the sides of the each construction layer
- At a freely definable distance to a component edge (wall edge)

Small boxes in the preview indicate the positions you can select.



- A Component axis
- B Possible positions on the sides of/centered in the layer or entire wall
- C Number of layers

You can place the component axis in several ways:

Intuitive

Use the mouse to move the axis: the cursor becomes a double arrow, and the component axis will snap to the positions marked by small black boxes. The values displayed on the left of the preview show the distance to the edges.

The following positions are predefined: Left edge of component or layer Right edge of component or layer Center of component or layer

Custom position based on numerical value
 Click one of the data entry boxes on the left of the preview area
 and enter any value defining the offset of the axis to the wall
 edge. The program automatically calculates the value for the
 other side.

Offset direction of components, single-layer walls

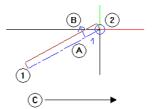
Components are entered along the component axis. Depending on the axis' position within the component, you can use the offset direction to specify on which side of the component axis (relative to the direction in which the component is entered) the component is drawn. With Reverse offset direction, you have the option to "tilt" the wall or to reverse the setup of the construction layers.

Tip: Using the offset direction, you can quickly toggle between inner and outer dimensions when entering walls.

The direction is indicated by an arrow and the position of the first construction layer. You can activate and deactivate these symbols using the Symbols when entering walls option in the Point snap options, Point snap representation area.

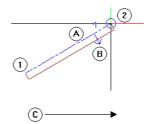
Depending on the position of the component axis, the following options are available:

• Single-layer wall, lateral component axis:



- 1 Start point of component
- 2 End point of component
- A Component axis
- B Offset direction
- C Direction in which component is entered

After clicking Reverse offset direction:



- 1 Start point of component
- 2 End point of component
- A Component axis
- B Offset direction
- C Direction in which component is entered
- Single-layer wall, centered component axis:
 Clicking Reverse offset direction does not make any difference.

Designing Walls

A 3D wall is always defined by four factors:

- Starting point
- Endpoint
- Offset direction defined by the position of the component axis (= line between the starting and end point) in the wall
- Height or association with the default planes

To ensure that the wall is displayed true-to-scale, you can define its thickness and select a hatching or a fill color for it.

It is also possible to set additional parameters such as a material and building trade.

Straight exterior walls

The exterior walls on the ground floor will be made of brick and will be 36.5 cm thick. Start by defining the component parameters.

You must also define which attributes can be entered for walls and which catalog should be used for the materials. In this tutorial, you will use populated pull-down menus for materials to which you can progressively add entries.

To set properties

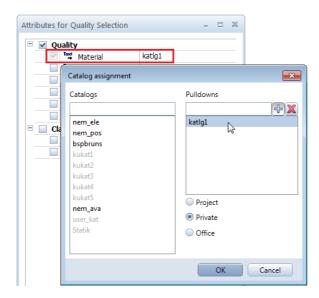
- **○** In the Tools palette, open the Basic: Walls, Openings, Components module (Architecture family).
- 1 Click Wall in the Create area of the Tools palette.
- 2 Click Properties.

Tip: You can modify the component properties of walls (and other architectural elements of the same type) at any time. Use the Modify Archit. Component Properties tool. You can modify elements in the same way as you create them.

3 On the Parameters, attributes tab, click the button beside Catalog assignment.

Material is automatically selected in the Attributes for quality selection dialog box; further attributes are not required.

Next, click the Material line in the right-hand column and select katlg1 in the Pull-down menus area of the Catalog assignment dialog box.



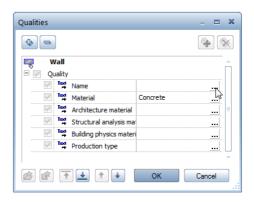
- 4 Enter the following information:
 - In the Number of layers area, select one layer.
 - In the **Positioning axis** area, drag the component axis to an edge of the wall in the graphics.

The position of the **component** axis controls the wall's offset direction. The component axis can be on a side of the wall or anywhere within the wall.

5 Enter the following information on the Parameters, attributes tab:

- In the first row, click the Material/quality column.

If multiple Qualities are active in the Catalog assignment dialog box, the following window appears. If only one Quality is selected, you can enter the material directly.



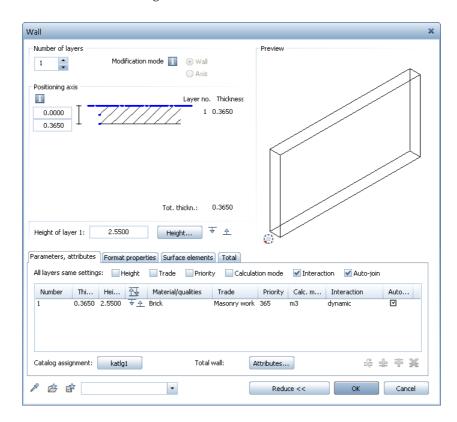
- Click ... in the Material row in the Qualities dialog box.
- Click in the Material list box that appears, enter Brick and click OK to confirm.
 This selects the entry 'brick' and adds it to the list.
- Click OK to confirm the Qualities dialog box.
- Enter the Thickness: 0.365.
- Click in the column below Trade and select Masonry work.
- Click the Priority column and enter 365.

The **priority** rating controls the manner in which components intersect. Components with a lower priority rating have a 'hole' cut in them where they are intersected by other components. This ensures that these areas are not counted twice in subsequent quantity takeoff operations.

Tip: When setting the wall's priority rating: thickness of wall in mm.

- For the Calculation mode select: volume.
- Set Interaction to dynamic.
- Select the Auto-join check box.

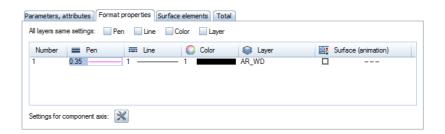
The Wall dialog box should now look like this:



- 6 Enter the following information in the Format properties tab:
 - Select pen (2) 0.35 and line type 1.
 - Select color 1 (black) and the AR_WALL layer.

An animation surface is not necessary at the moment.

The Format properties tab should now look like this:

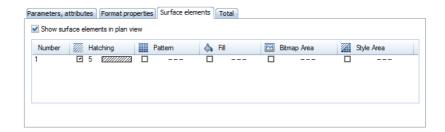


Note: The settings on the Format toolbar have no effect on the format properties of walls.

- 7 Enter the following information in the **Surface elements** tab:
 - Select the Hatching check box.

 Click to the right of the check box in the area where the hatching is displayed and select hatching style 5.

The Surface elements tab should now look like this:



Tip: The parameters you set in this dialog box are valid until you change them.

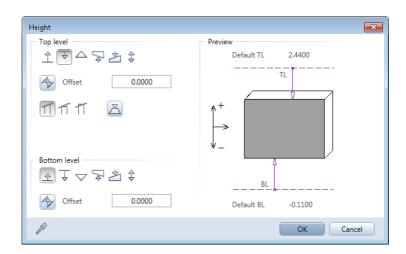
8 Now click the Height... button and set the height. Set the top and bottom levels of the wall so that they are attached to the upper and lower default reference planes respectively.

- Top level: click Relative to upper plane and enter 0 for the Offset.

As a result, the wall is flush with the upper default reference plane. You can ignore the slab for the time being. Using a separate drawing file, you will create it later between the top level of the ground floor and the bottom level of the first upper floor.

- Bottom level: click A Relative to lower plane and enter 0 for the Offset.

Tip: With multi-layer walls, attach each layer to the default planes separately. This way, you can also define a different offset between each layer and the planes!



9 Click **OK** to confirm the Height and Wall dialog boxes.

Tip: For more information on the **Wall** tool, press **F1**. This will display the relevant topic in the Allplan help.

Entering data in property sheets

- To enter a value, click in the data entry field. Type in the data at the keyboard and press ENTER to confirm.
- Existing entries are found during input and proposed in the data entry box. Press ENTER to accept the data proposed.
- To enter and add values in custom list boxes, click first.
- To apply entries, click **OK**.
- To discard entries, click Cancel or press ESC.

Drawing straight walls

When you have set all the parameters, you can now draw the walls. In this exercise, the values are outside dimensions. Therefore, the wall's offset direction is towards the inside.

To draw straight walls

- 1 Choose the wall type by clicking / Straight Component.
- 2 *Set properties, place start point* Click where you want the wall to start.

The wall is attached to the crosshairs.

- 3 Check and define the wall's offset direction:
 - In the Wall dialog box, you have defined a lateral wall axis. The axis of a straight wall is simply the line you enter.
 - The values are outside dimensions (see illustration below). Start drawing a horizontal wall on the left. As the starting point is on the outside, the wall's offset direction is upward (= towards the inside; see arrow in the following figure).
 - Check the preview displayed with the crosshairs. The small arrow should point upwards (= towards the inside).
 - If this is not so, click Reverse offset direction on the Wall Context toolbar to reverse the wall's offset direction.
- 4 Enter the $\triangle X$ dX length in the dialog line: 1.25.

Note: If the system prompts you to enter $\triangle y$, either click the $\triangle x$ data entry box or press the TAB key, which takes you to the next data entry box.

Tip: In the section that follows you use the keyboard to enter walls alternately in the X and Y directions. You can bypass the process of using the TAB key to switch between the boxes by selecting the Switch between X and Y data entry boxes automatically option on the Desktop environment - Track tracing page of the Options.

Tip: While entering elements, you can quickly change the component axis using short-cuts or in the dialog line. Look in Allplan's help for detailed information on changing the component axis using shortcuts.

Tip: If you can't see the whole drawing, click

Zoom All on the viewport toolbar at the bottom.

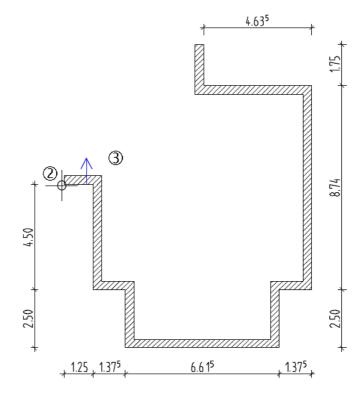
If you want, you can place the toolbar for controlling the on-screen display at the top of the viewport. To do this, open the View menu, point to Toolbars and click Viewport toolbar at the top.

Tip: You can also quit tools by clicking a toolbar with the right mouse button instead of pressing ESC.

Now draw the next walls as you would a polyline, entering values for the length of the walls along the x and y axes:

5 Enter the following values:

dY:	-4.5	dX:	1.375
dY:	-2.5	dX:	6.615
dY:	2.5	dX:	1.375
dY:	8.74	dX:	-4.635
dY:	1.75		



6 Press ESC to finish entering the wall and to quit the tool.

Curved walls

The plan (which is not yet closed) needs to be completed with a curved wall. This can be accomplished using the Curved Wall tool. A polyline is used to approximate the circle: this results in short, straight sections of linear components that can be addressed as a single entity.

In addition to the wall's end points and its offset direction (as with a straight wall), you need to specify the arc's direction of extension and the radius.

To draw a curved wall

- ⇒ Use to get a close-up view of the area where the curved wall is to be drawn.
- Double-click a wall with the right mouse button. This selects the Wall tool and sets the properties to those of the wall you clicked.
- 2 Click Properties

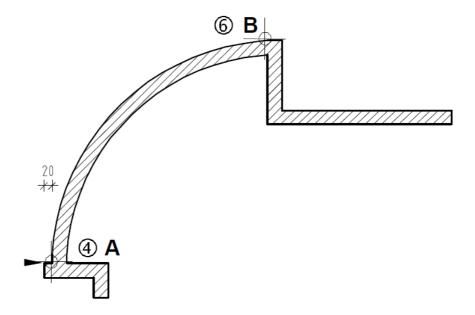
Change the Priority to 300 in the Parameters, attributes tab and click OK to confirm.

When walls have the same priority, the latest one has priority over the older one. To ensure that the ends of the curved wall do not 'cut off' the ends of the existing straight walls at the points where they meet, the curved wall's priority rating has been set to a value lower than that of the straight walls.

- 3 Select the Curved Component wall type. Use the Division parameter on the context toolbar to enter the number of segments to be used by the program to approximate a full circle: 120.
- 4 To place the starting point (A) of the wall, click the wall line (but not on a corner).

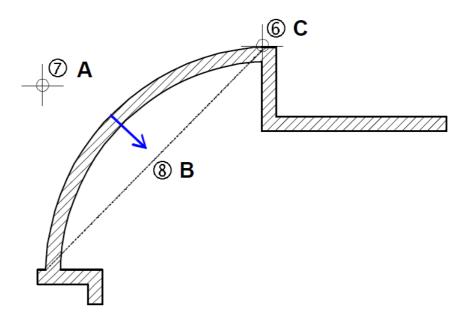
The reference point is displayed.

5 If it is not already there, move the reference point onto the corner of the wall on the left and enter an offset of **0.2**.



6 Now click the other wall's end point (B).
A straight line is displayed - this will serve as the reference line for the wall's and the arc's offset direction.

7 Place a point so that the arc's offset direction is toward the outside.



Tip: When the wall's offset direction and the arc's extension point are on the same side of the secant: the inside of the wall defines the secant.

When they are on opposite sides, the line on the outside of the wall defines the radius.

A = arc's extension point

B = wall's offset direction

C = end point

- 8 The wall's offset direction should be towards the inside. Check the arrow in the preview and if necessary, change the wall's offset direction by clicking Reverse offset direction.
- 9 *Parameter, radius, center of circle*Enter the radius: **5.745**. Then press ENTER to confirm.
- 10 The line representing the outside of the wall is displayed again so that you can check the radius. Press ENTER again.
- 11 Press ESC twice to finish drawing the wall and quit the tool.

Defining the radius, center of circle

- Radius: the system will propose the value that was entered last or a value that is equivalent to at least half the distance between the wall's start and end points.
- Midpoint: as an aid to orientation, a perpendicular bisector is displayed on the secant with the proposed center.

Definition options

- Accept the radius proposed by the system by pressing ENTER.
- Enter a value at the keyboard and press ENTER.
- Point and click: a center vertical point or another defined point is clicked.

The center then becomes the point at the base of the perpendicular between the point clicked and the perpendicular bisector. The value of the radius is displayed in the dialog line; press ENTER to confirm it.

Note: Look in the Allplan help for a list of possible combinations of the wall's and arc's offset direction.

Assigning layers

Now it makes sense to mark the center of the curved wall with a symbol and to dimension it, as we will need this point again.

You will assign a special layer to the center. This way, you can show and hide it later.

In the case of point symbols and other design entities like lines, rectangles, circles etc., layers are not assigned in the Properties dialog box (as opposed to walls).

In general, the appropriate layer for the selected tool is activated automatically!

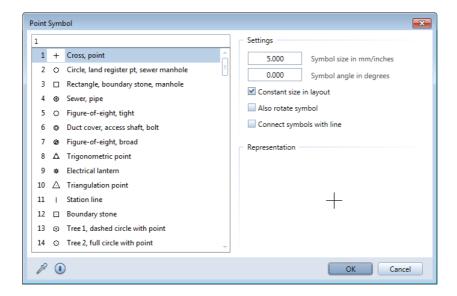
If it isn't, do the following.

- Open a tool
- Select a layer on the Format toolbar
- Draw

After you have opened the Point Symbol tool, the first step involves selecting the symbol. The next step is to select a layer. Then you can place the point symbol.

To select the current layer

- 1 Select a tool; in this example, click Point Symbol (Basic family Draft module Create area).
- 2 Select the first symbol (1 Cross, point), set the Symbol size to 5 mm and select the Constant size in layout option. Click OK to confirm.



Tip: To get an overview of the layers you have already used, switch to the Layers palette, open the shortcut menu and click List layers used in open documents. (You can also select the Select, Set Layers tool on the Format menu, switch to the Select Layer/Visibility tab and select the List layers used in open documents option.)

- 3 Click in the Select, Set Layers list box (Format toolbar).
- 4 If the layer DE_GEN01 is available in the quick selection list, click it.
- 5 If it isn't, click Select... and double-click the DE_GEN01 layer in the Single layer selection dialog box.



6 Place the symbol on the center of the curved wall.

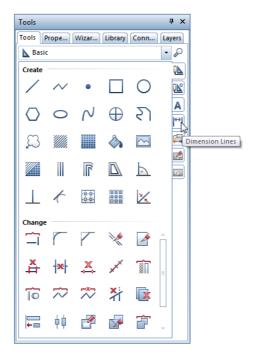
Dimensioning the center of the curved wall

The dimension lines will also get a special layer so that they can be hidden later.

In the case of dimension lines, layers and other format properties like pen, line and color are assigned in the Properties dialog box (as with walls or upstands).

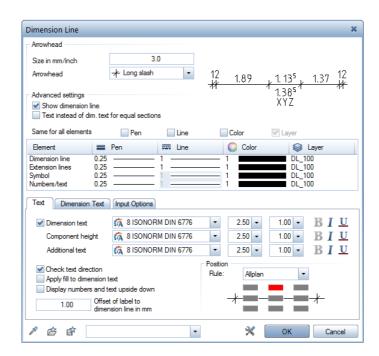
To create horizontal and vertical dimension lines

1 In the Tools palette, activate the Dimension Lines module (Basic family).

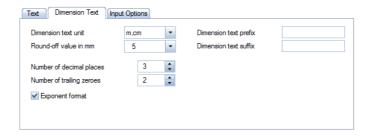


- 2 Click Dimension Line in the Tools palette, Create area.
- 3 Click Properties and make the following settings:
 - Select the layer DL_100.
 - Select the Nemetschek font
 8 ISONORM DIN 6776 (Text tab).

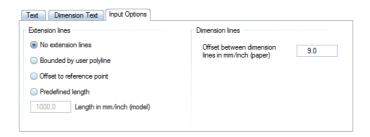
• In the Position area, select the Allplan rule and place the dimension text centered above the dimension line.



• Set the dimension text unit to m, cm (Dimension Text tab).



Select the No extension lines option (Input Options tab).



- Enter the other settings as shown.
- 4 Click **OK** to confirm the settings and dimension the center of the curved wall using Horizontal and Vertical dimension lines (Create area). (See illustration at the end of the next section.)

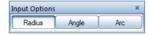
To dimension the radius

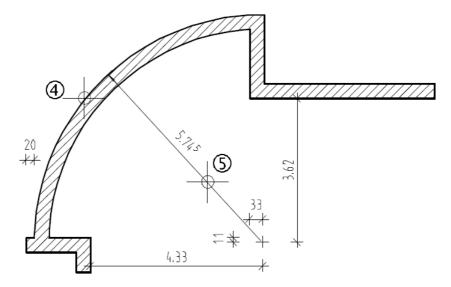
- 1 Click Curve Dimensioning (Tools palette, Create area) to dimension the curved wall.
- 2 Select the layer DL_100 (Format toolbar).
- 3 Set the unit of the dimension text in Properties to m. cm.

The Dim. text width is 2 mm.

Set the other parameters as for the horizontal and vertical dimension lines.

4 Click the line representing the outside of the curved wall and select Radius in the Input options.





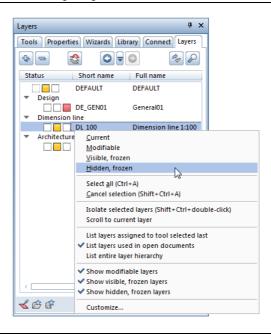
5 Click a point through which the dimension line is to pass and press ESC twice to quit the tool (or click the right mouse button when the cursor is positioned over a toolbar).

Turning layers on and off

Now you can hide the dimension line layer as the dimensions are not required at the moment.

To hide layers

- 1 Open the Layers palette.
- 2 Open the shortcut menu of the Layers palette and click List layers used in open documents.
- 3 Using the right mouse button, click the DL_100 Dimension line 1:100 layer and select Hidden, frozen.



Layers can be set to visible in the same way.

The current layer (displayed on the Format toolbar) cannot be hidden

In this case, select a different layer first e.g. the DEFAULT layer.

You can also show and hide layers using the Select, Set Layers tool on the Format menu. The shortcut menu of the Select Layer/Visibility tab provides the options you require.

Tip: When no tool is active, you can also open the Layer dialog box by double-clicking with the right mouse button in the workspace.

What to do when elements are no longer visible?

- Use the Layers palette or the dialog box of the Select, Set Layers tool (Format menu) to set all the layers to visible.
- If the elements are still not visible, the selected privilege set may not have the necessary privileges. Select the Select Layer Privilege Set tool at the bottom of the Layers palette and select an appropriate privilege set or ask your administrator for help. You can also select a privilege set in the Layer dialog box Select Layer/Visibility tab Privilege set list box.

Which layer is the element on?

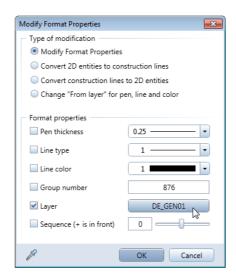
When you point to an element (without clicking it), a box with information on the element appears. According to the settings in the options on the Selection page, the Element name and Layer are displayed by default.

- You can find out which layers individual elements are on by turning each individual layer on using the Layers palette or the
 Select, Set Layers tool on the Format toolbar.
- You can find out which layer a single element is on by clicking the element with the right mouse button and selecting Format Properties.

All the properties including the layer are displayed and can be changed directly.

You can also change the layer of the current element. The layers of linked components (e.g. window openings in walls), however, do not change. It is usually better to use Modify Format Properties.

• You can change the layer assignments of one or several elements using the Modify Format Properties (Edit toolbar). This tool also modifies the layers of linked elements.



Interior walls

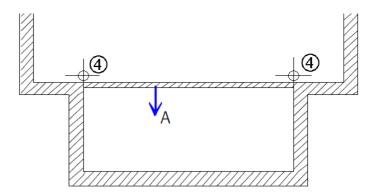
For the interior walls, you will adopt all the properties of an exterior wall. You will then change the thickness, calculation mode and priority rating.

To create interior walls

- **⇒** The Basic: Walls, Openings, Components module is open.
- 1 Double-click an exterior wall with the right mouse button.
 This activates the Wall tool and gets the element's properties at the same time. This way, you do not need to define the association with the planes (for the height) from scratch each time.
- 2 Choose the wall type by clicking / Straight Component.
- 3 Change the following Properties in the Parameters, attributes tab:
 - Thickness (m): 0.175
 - Priority: 175
 - Calculation mode: m²

Then click **OK** to confirm.

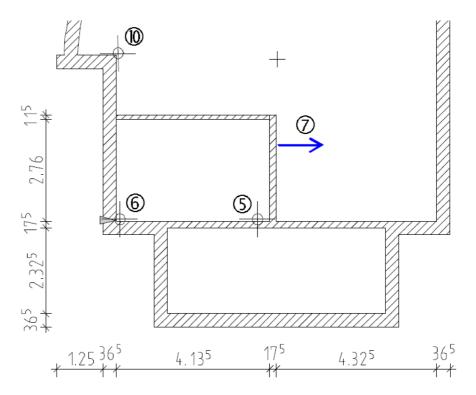
4 Set properties, place start point
Draw the first interior wall by clicking the inside corners. Check
the wall's offset direction in the preview and, if necessary, change
it by clicking Reverse offset direction.



(A) Wall's offset direction

Note: If new walls are fitted in between two existing walls or if the new walls end at wall points you have already defined, you do not have to press ESC to finish entering the walls.

- 5 To place the starting point of the next wall, click the top line of the new wall. The reference point is displayed.
- 6 Move the reference point onto the corner and enter the distance between the reference point and the start of the wall: 4.135.



7 Set properties, to point

Enter the length of the wall as follows:

dX: 0

TAB

dY: 2.76.

Offset direction to the right (see arrow in previous figure).

8 Modify the Properties (Parameters, Attributes tab):

- Thickness (m): 0.115

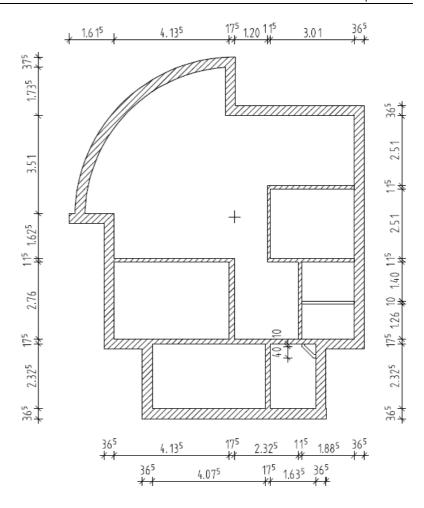
- Priority: 115

Then click OK to confirm.

- 9 Click Enter at right angles in the dialog line.
 If the program expects you to make an entry for the y direction, just enter 0 for dY in the dialog line.
- 10 Click the corner of the wall (see illustration above) to define the wall's end point.
- 11 Draw the other interior walls (see figure).

 Careful with the 10 cm thick wall!

 For this wall, change the material (Plasterboard), the building trade (Dry construction work) and the calculation mode (Length). You should also disable hatching.



Tip: Instead of pressing ESC to quit tools, you can also click the right mouse button when the cursor is positioned over a toolbar.

12 Press ESC to quit the tool.

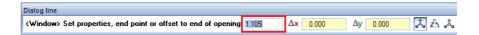
Reference point for entering architectural elements

When you insert an opening in a wall, for example, or join an interior wall with an exterior wall, you need to click a wall. The point you click should be near to where the new element is to begin.

Note: If you want to proceed in this way, make sure that intercept on/off is switched off in the dialog line.



The distance to the nearest reference point (e.g., start of wall, wall corner, side of an opening) is presented in the dialog line.



The reference point is displayed as an arrow in the construction line color. The point you clicked (where the new element is to begin) is marked by a square in the construction line color. The tip of the arrow points to the point you clicked.

Tip: For precision drafting you do not need to click exactly where the new element is to begin. Just enter the precise value in the dialog line.

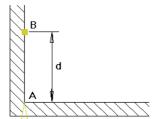


Fig.: entering architectural elements using reference points

- A Reference point; arrow points toward the new element's origin
- B Start (origin) of new element; set by clicking on the wall
- d Distance to reference point displayed in the dialog line

You can use the distance to the reference point as follows:

- Accept the value in the dialog line by pressing ENTER.
- Enter a new value in the dialog line and press ENTER to confirm.
- To change the position of the reference point because the distance to another corner on the wall is a known value just click the other point. The new distance is displayed in the dialog line.

Note: Allplan always defaults to the nearest reference point.

A note on walls with multiple construction layers

Note: The following sections cover the essentials for drawing walls with multiple construction layers.

If you want to skip these sections and continue drawing, proceed as described in "A note on views and viewports (on page 67)" or "Axis grid (on page 77)".

Walls with multiple construction layers are defined in the same manner as simple walls with a single construction layer. However, the following differences apply:

- you can define up to 20 construction layers.
- You need to enter the material, thickness, building trade, format
 properties and surface elements (hatching, pattern and fill) separately for each of the construction layers in the wall. To do this,
 the Parameters, attributes, Format properties and Surface elements tabs include one line per construction layer.
- The height and priority are also entered layer by layer (depending on which check boxes are active in the All layers same settings area on each tab).
- You can set different layers for each construction layer (Format properties tab).

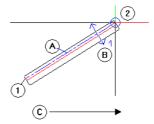
- The component axis can be positioned freely; for example, centered in each construction layer (Preview area).
- Pay attention to the manner in which walls/construction layers intersect, which is controlled by the priority rating.
- You can assign a different priority rating to each construction layer.
- Attributes (e.g. position, type) can also be entered for the entire wall.

Offset direction of components, walls with multiple construction layers

You have already encountered the offset direction of components; this topic was already covered in the section entitled "Offset direction of components, walls with a single construction layer". In the case of multi-tier walls, the position of the component axis is particularly important when the axis is not set to a side of the component edge but centered in the component or off-center. Pay special attention to the position of the first construction layer you can see in the preview.

Depending on the position of the component axis and the number of the construction layers, the following options are possible:

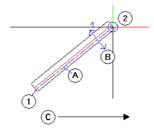
• Multi-layer wall; lateral component axis within the component (between layer 2 and layer 3):



Start point of component

- 2 End point of component
- A Component axis
- B Extension to both sides of the component axis
 - not centered, first layer on the right
- C Direction in which component is entered

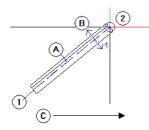
After clicking Rotate about axis:



Start point of component

- 2 End point of component
- A Component axis
- B Extension to both sides of the component axis not centered, first layer on the left
- C Direction in which component is entered

• Multi-tier wall, component axis centered in the component:



Start point of component

2 End point of component

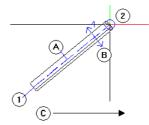
A Component axis

B Extension to both sides of the component axis

first layer on the right

C Direction in which component is entered

After clicking Rotate about axis:



Start point of component

2 End point of component

A Component axis

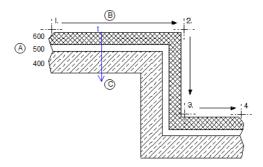
B Extension to both sides of the component axis

first layer on the left

C Direction in which component is entered

Priority Rating with Multi-Tier Exterior Walls

If the first construction layer in a multi-tier wall represents the exterior side, it should be given the highest priority rating – this will ensure that the manner in which the various tiers intersect at corners is calculated correctly.



Legend:

1 - 4 Direction in which straight wall is entered

A Exterior wall's priority ratings:

Layer 1 = 600

Layer 2 = 500Layer 3 = 400

B Exterior side

C Offset direction to the side (in this case to the right)

Figure: Priority Rating with Multi-Tier Exterior Walls

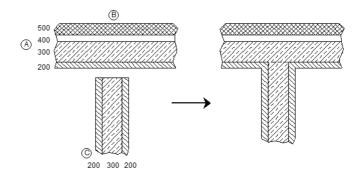
Priority rating at T-connections

To obtain correct results with T-connections, assign the same priority rating to the construction layers that are to intersect.

This applies both to connections obtained as you draw and connections that arise as a result of the

Join Linear Components and

Join Linear Component with Line tools.



Legend:

A Exterior wall's priority ratings:

Layer 1 = 500Layer 2 = 400

Layer 3 = 300

Layer 4 = 200

B Exterior side

C Priority ratings of interior wall:

Layer 1 = 200

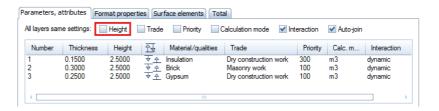
Layer 2 = 300

Layer 3 = 200

Figure: priority rating at T-connections

Multi-tier walls with different height settings

The height of multi-tier walls is defined in the same way as single-tier walls. If individual construction layers are to be lower (because of a floor slab, for example), check that the Height option in the All layers same settings area (Parameters, Attributes tab) is disabled. You can then assign a different height to each of the construction layers in the wall.



Associate the height of the individual construction layers with the upper or lower default reference plane and, for the layers that are lower, enter the thickness of the slab as a negative value in the Offset box.



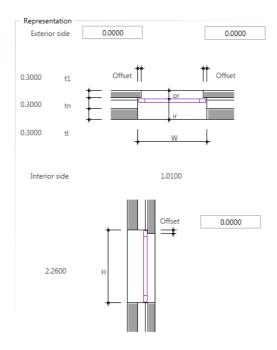
Windows and Door Openings in Walls with Multiple Construction Layers

To insert window and door openings in multi-tier walls, proceed as you would with single-tier walls. In the Properties dialog box, you also need to switch to the Reveal tab.



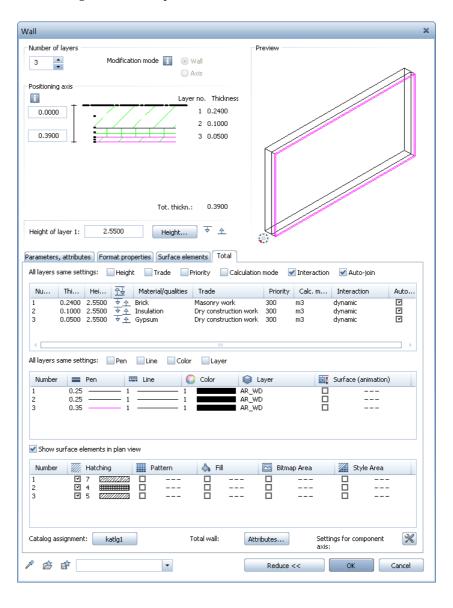
Here – depending on the number of construction layers defined (at least two layers) – you can choose from different styles and enter values for the Offset.

Tip: You can use the Opening Designer to design door and window openings by entering parameters for facing blocks, rabbet shapes, roller blind housings, lintel and header elements, etc. These openings can be saved and retrieved when needed.



Example: a wall with multiple construction layers, each of a different height

Settings for the wall parameters:

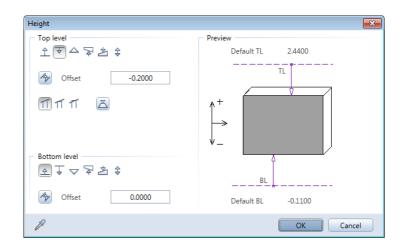


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Height setup for layer 1:

• Top level: Relative to upper plane, offset: -0.2

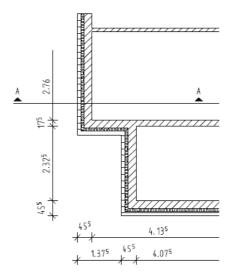
• Bottom level: A Relative to lower plane, offset: 0



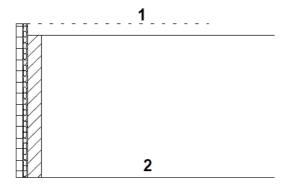
Height setup for layers 2 and 3:

• Top level: Relative to upper plane, offset: 0

• Bottom level: A Relative to lower plane, offset: 0



Plan



Section: 1 = Upper default plane; 2 = Lower default plane

If necessary, undo the changes above for the exercises that follow.

A note on views and viewports

Note: The following sections cover the essentials for working with views and viewports.

If you want to skip these sections and continue drawing, proceed as described in "Axis grid (on page 77)".

When working with walls and other components, you can get an impression of how the building looks in 3D space at the click of a mouse button. Each viewport has its own set of viewing tools in the lower viewport border.



Tools on the viewport toolbar

Using the tools on the viewport toolbar, you can not only navigate freely on 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 a another tool (e.g. Line) is active.

You cannot see the viewport toolbar until you move the cursor to the bottom of the viewport, guaranteeing as large a workspace as possible. If you are working with multiple viewports, each viewport has its own viewport toolbar.

Icon	Function	Use
(Standard Views flyout	Using the Standard views flyout, you can choose between plan view and any of the standard views.
		Tip: You can also set the standard views by pressing and holding down the CTRL KEY and pressing a NUMBER KEY on the number pad. This is only possible when NUMLOCK is active.
		Note: 2D elements are only displayed in 3D views when the
		2D elements in 3D views option is selected in 🖭 Show/Hide.
Ȣ ××	Zoom All	Refresh sets the display scale so that all the elements in the visible files can be seen. But if you have loaded a view using Save, Load View, only this view is displayed.
		Press ESC to cancel the process.
		Tip: You can also double-click the middle mouse button.
€,	Zoom Section	Zoom Section zooms 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.
		Note: If several viewports are open, the zoomed section is displayed in the viewport in which you clicked the button. The section itself, however, can be defined in any of the viewports. Requirements: you have not selected a perspective view and the same view is displayed in both viewports.
		Tip: You can also use the right mouse button to define the section without activating the Soom Section tool.
Ø,	Navigation Mode	Switches navigation mode on and off. In design mode: sets a perspective view. When dragging, the cursor behaves in the same way as in animation windows (sphere mode, camera mode). In navigation mode: when switched off, you can draw in animation windows as you would in isometric windows.
4	Previous View	Previous View displays the previous view.
10000 B		
C	Next View	Next View displays the next view.



Save, Load View

Save, Load View saves the view currently set or loads a view you have saved. This way, you can set views that you require time and again.

Note: As long as the icon is active (pressed in), clicking Refresh does not refresh the entire drawing but just the saved view. To deactivate the icon, click it again.

3D View

You can use the 3D View tool to display 3D models in three-dimensional space in a perspective view by entering an eye point (observer) and target point. You can also use this tool to create a view based on the building structure.

The view displayed on screen can be saved as a wireframe model or as a hidden line image in a separate document. The drawing file to which you save then contains the view as a simple 2D drawing that you can then edit (in plan view) using the tools in the Draft and Text modules.

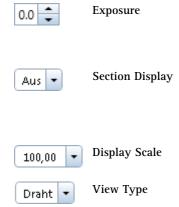
Note: You can also select a default view by opening the View menu and clicking View. You can also click an icon in the on the viewport toolbar.

Element Selection

Lets you select the design entities you want to display in the current viewport. The program temporarily hides all the other design entities.

-)= Always on Top

Always on Top places the viewport so that it is always on top (i.e., in front of) the other ones. This tool is only available when the Connected option is not selected and the viewport is not maximized.



Exposure controls the brightness in a viewport with the Animation view type. You can enter a value between -25 and 25. This setting only applies to the current viewport. When rendering, the program does not take this setting into account.

Activate Section displays an architectural section that you have defined with Clipping Path. You can identify the section by selecting it on the dropdown menu or by clicking it in the workspace. switches the section display off.

Sets the display scale. You can select from a list of default values or enter any value in the data entry box. Then press ENTER to confirm.

Displays the contents of the current viewport in one of the following ways:

Wireframe Hidden Animation Sketch RTRender

You can use New view type... to define and save your own view types.

Click to modify the view types. The settings you make apply to all the viewports with this view type.

Note: Using Hidden Line Image, Wireframe, you can save a 2D hidden line image to a separate file.

The layout editor provides additional view types you can use to switch between design view and print view. The latter shows the layout as it will be printed.

Design view

The Design view displays the elements of the layout as you have created them. Any superordinate pen, line or color defined is taken into account. You can use the options provided by the Show/Hide tool to specify the type and scope of the elements displayed. The settings in the Print Layouts tool are ignored.

Print view

The Print view displays the layout as it looks in the printout. Depending on the printer set, the printout is in color or monochrome. The elements you have selected in the Elements to print area and the parameters you have defined on the Print profile tab of the Print Layouts tool define the on-screen display. Only a few options are available in Show/Hide.

Note: So that you can work quickly and easily, the print view also displays elements that are outside the page, the margins of the page and, if selected, the printable area of the output device although they are not included in the final printout. The same applies to the selection color and the detection color. These colors are used in the print view so that you can see better what you are doing. But the Print Layouts tool uses the colors you have assigned.

Note: You can find more tools for controlling the on-screen display on the View menu:

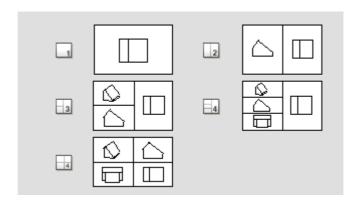
Icon	Function	Use
2	Pan	Pan Pans the section that is visible in the active viewport by a vector you specify. To enter a vector, press and hold down the left mouse and then drag. You can also pan in the active viewport by pressing and holding down the middle mouse button and then dragging. Alternatively, use the cursor keys.
G.S.	Refresh	Regen regenerates the section that is visible on screen. Press ESC to cancel the process.
Θ	Reduce View	Reduce View Reduces the section displayed on screen in incremental steps. (The display scale doubles.)
•	Reduce View	Enlarge View Enlarges the section displayed on screen in incremental steps. (The display scale halves.)

Tip: The tutorial uses the Connected option (default setting, Window menu). When you change the size of a viewport, all the other viewports adjust interactively. New viewports are integrated in the existing arrangement.

With Allplan you can display a number of different views on screen simultaneously and work in all of them. You can set a different view in each viewport. For example, you can display a section, the entire design or an isometric view.

You can select from one of the standard viewport arrangements provided and then modify it to suit your needs.

Select the viewport arrangement you want to use on the Window menu.



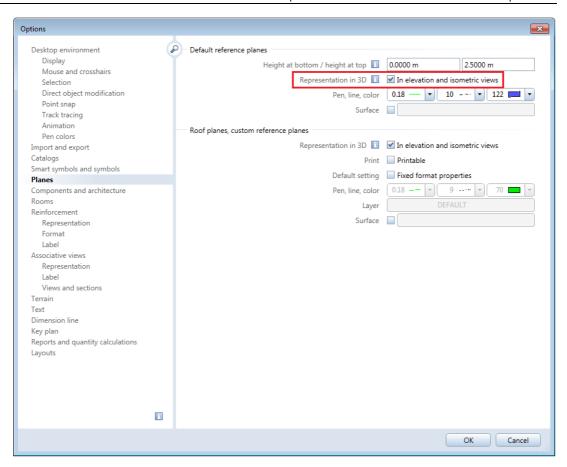
How to set viewports: detailed view and full view

The following exercise will help you understand how the viewports work.

Viewports: detailed view and full view

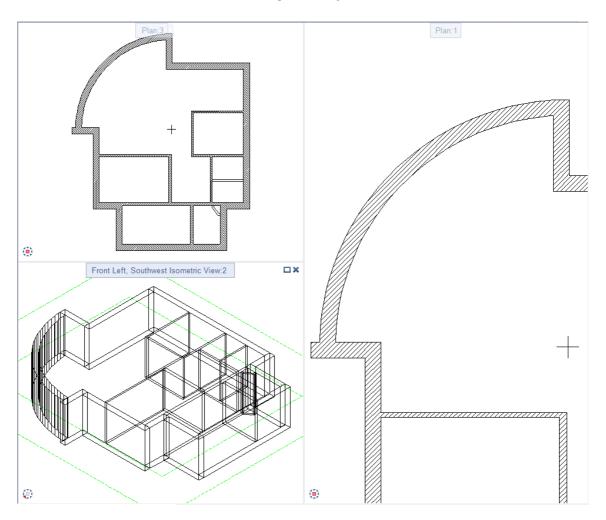
- 1 Open the Window menu and click 3 Viewports.
- 2 Click Plan in the viewport at top left.
- 3 Click Front Left, Southwest Isometric View in the viewport at bottom left.
- 4 Here you can display the default planes of the ground floor .

 Click Options and select the Planes page, Default reference planes area.
 - Select the 3D representation in elevation and isometric views option and close the dialog box.



- When this option is selected, default planes are displayed as a square of 2mx2m at the origin in all views on screen.
 To adapt the size of the default planes to your design, click
 Restore 3D View (Change area, Basic: Walls, Openings, Components module).
- 6 In the Input Options, click Def Pl (default planes).

The default planes displayed adapt to the size of your design. The default planes extend one meter beyond the external boundaries of the design so that you can see better.



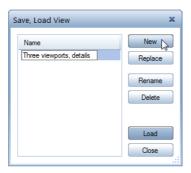
7 Click Soom Section in the viewport at top right and define a section by clicking two diagonally opposite points with the left mouse button.

These three viewports enable you to work on details while still displaying the entire drawing in another viewport.

If you want, you can also save this viewport arrangement and retrieve it later without having to make additional settings.

To save the arrangement of viewports

- 1 On the Window menu, point to Save, Load Arrangement and click Save, Load....
- 2 Click New and enter a name for the arrangement.



This saves the arrangement of viewports. You can use Load to retrieve it when needed.

Axis grid

You will now create an axis grid. This will help in the process of positioning the columns in the exercise that follows.

To create an axis grid

■ Make drawing file 1 Grid current and set 100 Ground floor, model to reference mode.

Note: Only drawing files of active structural levels can be selected together. Make sure that the Detached house and Ground floor levels are checked.

- ⇒ In the Tools palette, activate the Advanced Draft module (Basic family).
- 1 Click Axis Grid (Create area).
- 2 Set the following parameters on the X Direction tab:
 - Pen 0.13
- 7
- Line 11
- Number of regions 5
- Overlap 0.3
- In the Automation area, select the Same pen, line, color in all regions check box.

Tip: You can configure the program to display all the elements in reference drawing files using a single color, which you can select in the Options. Open the Desktop environment - Display page and select the Use same color for elements in reference drawing files option in the Drawing file and NDW window area.

78 Axis grid Allplan 2015

Axis Grid				×		
X Direction Y Direction						
Label						
Text parameters	Parameters		Region	1		
Text angle	0.0000		Pen	0.13		
Text offset	0.1000		Line	11		
Label's format	1 2					
Initial label			Color	1		
Border		_	Number of axes	2		
	Border styles		Offset	1.0000		
Top ▼	Position of label		General parameters			
Start of label			Number of regions	5		
Left			Overlap	0.3000		
Automation						
Same pen, line, color			Match Y label			
in all regions		Generate regions based on offsets				
》 合 🕯				OK Cancel		

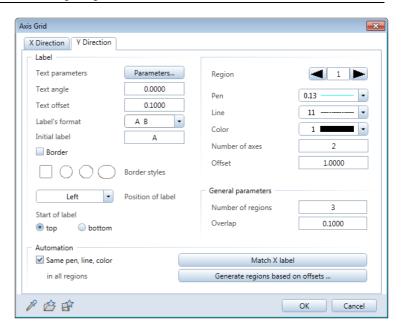
This creates five regions. You will now specify different distances between the grid lines in each region.

With the "Overlap 0.3" setting, each axis projects by 0.3 m beyond the grid (see the illustration at the end of this exercise).

3 In the Region area, click the arrow pointing towards the right.
This lets you select the regions so that you can define the spacing between lines as follows:

Region	1	2	3	4	5
Number of axes	1	1	1	1	2
Offset	1.25	1.375	6.615	1.375	1.25

4 In the Y Direction tab, select the label format A B, set Pen, Line and Overlap as in the X Direction tab and create 3 regions.



5 In the **Region** area, click the arrow pointing towards the right again. This lets you select the regions so that you can define the spacing between lines:

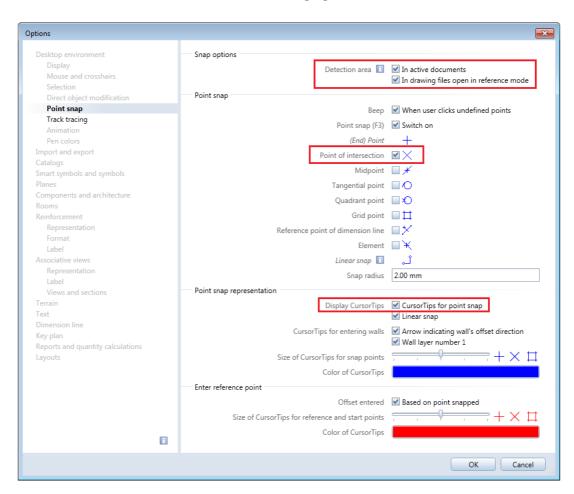
Region	1	2	3
Number of axes	1	1	2
Offset	9.4	2.5	2.755

- 6 Click OK to confirm and in the Select, Set Layer list box on the Format toolbar, select the layer DE_GRID.
- 7 Using the input options you can specify whether you want to display the grid lines as 2D or 3D lines. If necessary, click 2D Line.
- 8 *Click drop-in point*Position the grid somewhere on the left, near the top of the floor plan.
- 9 *Start point, reference line or rotation angle*Press ENTER to confirm the value of **0.00**, which is proposed by the system (or enter the value).
- 10 Click Move (Edit toolbar) and select the grid by clicking it.

80 Axis grid Allplan 2015

To place the grid directly over the floor plan, you can use the following point snap mode settings:

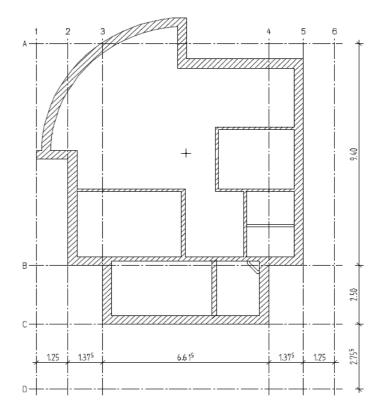
- 11 Click in the workspace with the right mouse button and select **Note:** Point snap options on the shortcut menu.
 - In the Point snap area, select the Point of intersection check box and clear all the other check boxes.
 - In the Point snap representation area, select the Display point snap symbols option and make sure that In active documents and In drawing files open in reference mode are active in the Snap options area.



Tip: Zoom in on a corner of the building using **Section**.

Tip: You can also use lines and parallel lines to create the grid.

12 *Place a point (from point) or enter the dx vector - To point*Click a suitable intersection point on the grid and position it on an appropriate corner of the building.



- 13 Dimension the grid as shown above. Please make sure that you use the DL_100 layer.
- 14 The dimension lines are not required for the next steps. Hide them.

To do this, go to the Layers palette, click the DL_100 Dimension line 1:100 layer with the right mouse button and select Hidden, frozen.

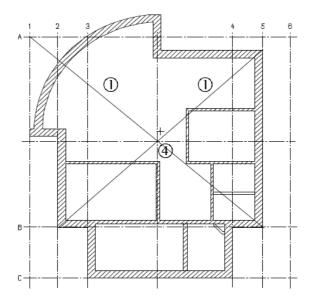
82 Axis grid Allplan 2015

Note: If the grid doesn't turn out as shown here, you can always alter it using Modify Axis Grid (Change area). The procedure is the same as for entering the grid. The only difference is that you do not have to place it.

Now only the grid lines for the round column inside are missing. You can define the position graphically.

To draw additional grid lines

- **⇒** The current layer is DE_GRID.
- 1 Switch Construction Line mode on (Format toolbar) and use the Line tool (Tools palette, Draft module, Create area) to create two diagonals.



- Switch Construction Line mode off again.
 To do this, click Construction Line (Format toolbar) again.
- 3 Click Match (Format toolbar).



- 4 In the Match selection dialog box, click All to select all the options in a single step. Then click a grid line.

 The layer, color, pen thickness and line type settings of the grid are copied to the Format toolbar.
- 5 Now draw a horizontal line and a vertical line through the point where the diagonal lines intersect:
 - Click Parallel Lines (Tools palette, Draft module, Create area), select a grid line (*Through point*) and click the point of intersection. Draw the second line in the same way.
- 6 Press ESC to finish.
 You can delete the temporary diagonal lines.

84 Columns Allplan 2015

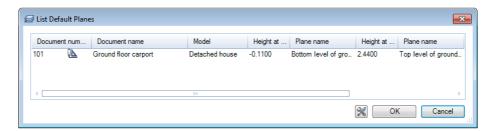
Columns

Tip: You can also use the Column tool to make any other column-shaped element - for example, table legs, lamp posts, railing posts.

Now you can draw the columns: the rectangular columns and interior column on drawing file 100, the carport columns on 101. The approach is the same as for entering walls: start by defining the component parameters, then place the element in the drawing file.

To place columns

- Set drawing files 1 Grid and 100 Ground floor model to reference mode and make drawing file 101 Ground floor carport current.
- Select List Default Planes (Tools palette, Create area in the General: Roofs, Planes, Sections module) to check the height and plane settings in drawing file 101 Ground level carport: Height at bottom: -0.11; Height at top: 2.44 (like drawing file 100 Ground floor model).



- 1 Click Column (Tools palette, Create area in the Basic: Walls, Openings, Components module).

 Check that the layer AR_COL is selected. If it isn't, activate it in the Layers palette or on the Format menu or toolbar.
- 2 Click Match (Format toolbar), disable the Layer option in the Match selection dialog box and click OK to confirm the dialog box.

Now click a wall line. This copies the line's settings (pen (2) 0.35 and line type 1).

3 Click Properties and set the following parameters:

• Outline area: Pround

• Parameters area: radius = 0.100

In the Attributes area: Trade: Carpentry work

Priority: 100

Calculation mode: m³

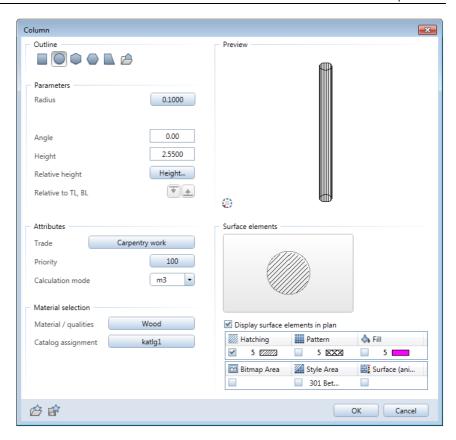
Material selection area:
 Material / qualities: Wood

4 Check the Height of the column (it should be the same as for the walls):

- Top level: Top level: Relative to upper plane at an offset of 0

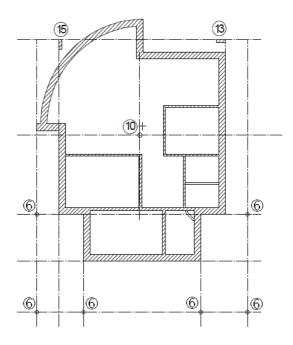
- Bottom level: A Relative to lower plane at an offset of 0 and click OK to confirm the dialog boxes.

86 Columns Allplan 2015



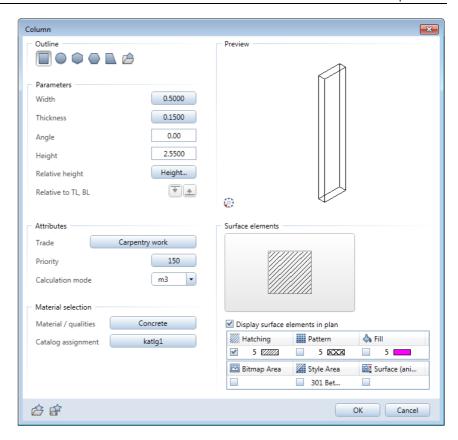
- 5 Set the column's anchor point on the **Column** toolbar to **Continuous** centered. The point snap options you set for previous exercises are still valid.
- 6 Place six columns for the carports on the points where the grid lines intersect and press ESC to quit the tool.
- 7 Select Open on a Project-Specific Basis, make drawing file 100 Ground floor model current and set drawing files 1 Grid and 101 Ground floor carport to reference mode.
- 8 Click Column (Create area in the Basic: Walls, Openings, Components module).

- 9 Click Properties and change the radius: 0.125.
- 10 Place another column on the point of intersection near the middle of the building.



- 11 Click Properties and define the height:
 - Outline area: rectangular
 - Parameters area:Width = 0.500Thickness = 0.150
 - In the Attributes area: Trade: Concreting work Priority: 150
 - Material selection area: Material / qualities: B25

88 Columns Allplan 2015



- 12 Set the column's anchor point to 🖾 top right.
- 13 Place the column on the point where the grid lines intersect at top right.

You can also rotate the column profile.

- 14 Change the angle in Properties: 90.
- 15 Place the column on the point of intersection at top left.

- 16 Now you need to change the point snap options for the steps that follow. Click in the workspace with the right mouse button and select **Point snap options** on the shortcut menu.
 - In addition to the Point of intersection option, select the Element and Midpoint check boxes in the Point snap area.
 - All the other settings remain unchanged.
- 17 Press ESC to quit the Column tool.
- 18 Click Open on a Project-Specific Basis and close drawing files 1 Grid and 101 Ground floor carport again.

Only drawing file 100 Ground floor model is open.

Now the round, exterior carport columns are no longer visible as you have closed the relevant drawing file.

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Openings

The procedure for creating **Openings** – be it a door, window, niche or recess – is always the same. The differences lie in the property settings you can make.

Like in the 'real' world, there is an inherent association between walls and openings in Allplan. When you move a wall, for example, its openings will move too.

Openings also provide the space for SmartParts or smart symbols. A SmartPart is a parametric Allplan CAD object that acts according to its own inherent logic, which is independent of the CAD system. Parametric information is controlled by a script, which is attached directly to the object. SmartParts can be inserted in existing openings for windows and doors in linear walls. They adapt to any outline.

As the name implies, a smart symbol is an 'intelligent' symbol that adapts to its opening dynamically.

Using Allplan, you can also create window reveals and door reveals and include them in quantity takeoff operations.

Doors

In our project, all the doors on the ground floor are single doors. The entrance door is 2.135 m high, the interior doors 2.01 m high. You will begin by drawing the door swing. The procedure for creating door openings also applies to all other kinds of openings.

Entering openings

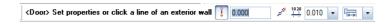
- Click the first point of the opening.
- Enter properties and set the height.
- Enter the width of the opening.

You only have to make the settings for the opening once if you want to create a series of identical openings. The properties and the height information are stored by the system until you redefine them.

To draw doors

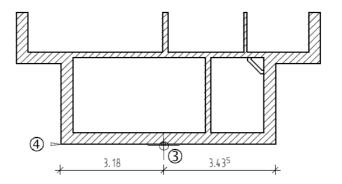
- 1 Click Door (Tools palette, Create area in the Basic: Walls, Openings, Components module).
- 2 Open the Layers palette and select the layer AR_WALL.
- 3 Click a point of the exterior wall at the bottom to place the first side of the door.

Note: Make sure that you enter a value of 0.000 for the off-set to reference point in the dialog line; otherwise, you cannot use this entry option. Alternatively, you can also enter the desired offset and click the corner of the wall.



The reference point is represented by an arrow and the offset is displayed in the dialog line.

4 If the reference point is not displayed on the corner as shown below, click the corner to move it there.



Tip: To enter the offset of openings based on the reference point, switch off the Enter offset directly option by clicking the icon.

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- 5 Enter the offset: **3.18** (left reference point) or **3.435** (right reference point).
- 6 Click Properties.
- 7 Select the rectangle for the door type.
- 8 Click the **Door swing** icon and select the symbol representing the single-leaf door swing.

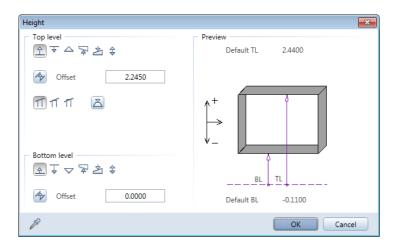


Tip: Modifying door swings is that easy: Select the Door tool and click in the door opening. Select a different Door swing in the dialog box that appears. The old one is automatically deleted.

Make sure that you have selected the correct layer.

9 Click Height.

This is where you set the height of the top and bottom levels of the door opening. Note: The top level of the door opening is also attached to the lower default reference plane. This ensures that the height of the door will not change, even if the height of the story is modified.



- 10 In the Top level area, click Relative to lower plane and enter the following unfinished dimension:

 Door height + floor covering: 2.135 m + 0.11 m = 2.245 m.
- 11 In the Bottom level area, click A Relative to lower plane (offset: 0.00) and click OK to confirm.
- 12 if necessary, clear the Create reveal element check box and click in the Library element 1 to n area.

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Door × Reveal Opening Shape Opening dir. Representation Parameters 1.0100 Width of opening 0.0000 Height of sill Opening 2.2450 height Opening height width Relative height Height... Sill: format properties 1 4 Relative to TL, BL Color Layer IIII Line Pen Pen ✓ AR_WALL French door Library element 1 to n Sill representation Γ Create reveal element None Outside Retrieve reveal Inside 合 On both sides 合命 Cancel

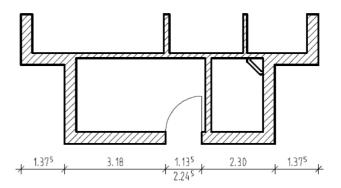
The Door dialog box should now look like this:

Tip: The width of the opening displayed in the dialog box is a proposed value; you can change it at any time. So you can quickly create a number of doors of the same type and height but of varying width.

Tip: To create several doors of the same width, you can disable the prompt for opening width in the dialog line.

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

14 Enter the *offset to end point* (the width of the opening) in the dialog line: 1.135.



15 Specify the direction of the door swing.
The preview is attached to the crosshairs.

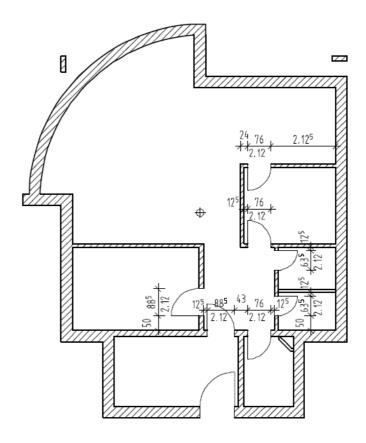
Next, place the interior doors. These are to have a different height!

- 16 If the Door tool is no longer open, click it again, place the door opening in an interior wall, open the Properties and click Height.
- 17 Click Relative to lower plane for the Top level, enter 2.12 and click OK to confirm both dialog boxes.

Tip: To quickly check the design visually in 3D space, you can select a standard isometric view and create an accelerated hidden line representation by setting the view type to Hidden line image.

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18 You can now insert all the interior doors.
Make sure that the offsets and the width of the openings are correct.



19 Press ESC to quit the tool or click a toolbar with the right mouse button.

Windows

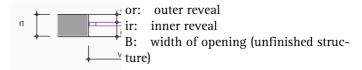
Tip: You can modify the reveal later using
Define, Modify Reveal
(Tools palette, Change area in the Special: Walls, Openings, Components module).

The next step is to insert openings for windows. Some of the openings will be wider and higher than the others and the height of the sill in each opening is also different.

After having created the window openings, you will assign Smart-Parts to some of the openings and smart symbols to the other ones. The position of a smart window symbol or SmartPart within the window opening is based on the position of the window reveal.

The use of precise measurements is not only important for ensuring that the elements are displayed correctly on screen - it is also critical if the reports and analyses you generate later are to be accurate. The system's built-in checker makes sure that the sum of the reveal measurements is equivalent to the total thickness of the wall.

Reveal



SmartParts

SmartParts are parametric Allplan CAD objects that act according to their own inherent logic, which is independent of the CAD system. Parametric information is controlled by a script, which is attached directly to the object.

You can insert SmartParts for windows, window sills, doors and shading elements in existing openings in linear walls. They adapt to these outlines.

In order to edit SmartParts, you can use handles (graphic modification) or a dialog box (alphanumeric modification). To modify SmartParts graphically, you can use the Modify SmartPart using Handles tool, which you can find on the shortcut menu of a SmartPart.

It is also possible to use the handles and dialog box in combination.

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Double-clicking the SmartPart with the left mouse button opens the properties palette of the SmartPart and displays the handles. Any changes you make to the SmartPart are displayed in real time. You can save the modified SmartPart as an smv file using the Save as a favorite tool. You can also save the modified SmartPart in a folder of the Library palette.

In the following exercise you will model your own window Smart-Part. To make things easier, you can find the required settings in a favorite file in the project folder.

Smart symbol

any drawing file at any time.

A smart symbol is an intelligent design object which automatically adapts to the size of the opening in which it is inserted. The way these symbols appear on the screen is scale-dependent. At a scale of 1:100, for instance, the element is displayed as a mere outline whereas at a scale of 1:10, the element is displayed in greater detail. Smart symbols are saved like symbols and can be placed in

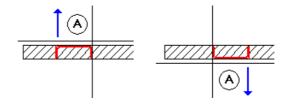
In the following exercise you will use a smart symbol in the default folder of Nemetschek's library. For this, however, you need the basic symbols. Check whether you have installed them together with Allplan.

Using the Smart Window and Door Symbols tool (smart symbol designer), you can create your own smart door and window symbols. For more information see Unit 5: Smart Symbols and SmartParts (on page 267).

Direction in which openings are entered (windows and doors)

If you define different values for the inner and outer depth of the reveal or if you want to insert window or door openings in multi-tier walls, it is important that you pay attention to the direction in which you enter the opening:

- The point on the wall you click always defines the exterior side of the opening.
- The preview of the opening, which is displayed attached to the crosshairs, is closed on the outside and open on the inside.
- If you need, you can use Anchor Point to change how the opening is attached to the cursor in the preview before you insert the opening in the wall: this makes it easier to use existing corners or wall junctions when you enter openings based on reference points.



A wall line clicked = exterior side of opening

Creating windows

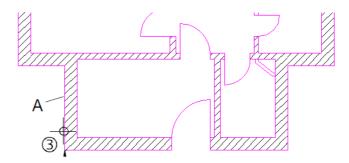
To create windows

- 1 Click Scale (status bar) and set the reference scale to 1:50.
- 2 Click Window (Tools palette, Create area, Basic: Walls, Openings, Components module) and, if necessary, activate the layer AR_WALL.
- 3 *Set properties or click a line of an exterior wall*Place a point for the first side of the opening on the exterior wall and correct the offset to the corner: **0.615**.

Tip: If necessary, change the anchor point on the context toolbar and the position of the reference point.

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It is important that you click the outer line of the wall (A) as the smart window symbol will use this later for orientation.

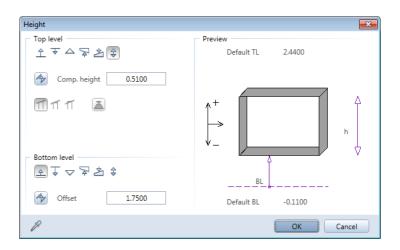


- 4 Click Properties.
- 5 Choose the rectangular window and select the Create reveal element check box.
- 6 In the Representation of sill area, select the On both sides option; in the Sill: format properties area, select pen 2 (0.35) and line 1.

Set the height of the top and bottom levels of the window opening.

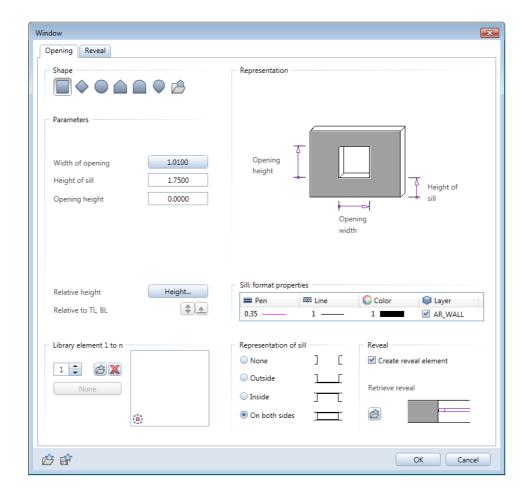
7 Click Height....

- 8 Enter the following values:
 - In the Top level area, click Fixed component height and enter 0.51 (same as height of opening).
 - In the Bottom level area, click ★ Relative to lower plane and enter 1.75 for the offset.



9 Click **OK** to confirm.

The Window dialog box should now look like this:



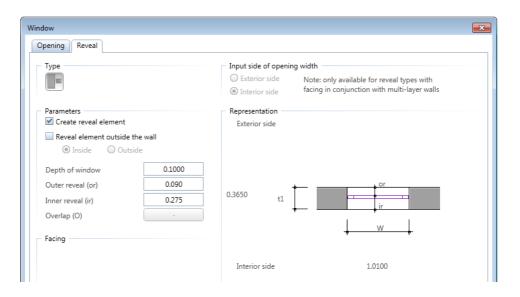
Tip: The value for the Height of sill is displayed in the Window dialog box. This is the relative height of the sill based on the distance between the sill and the reference plane or a reference element.

10 Switch to the Reveal tab.

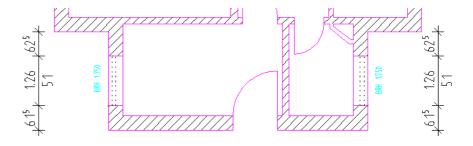
11 Set the reveal as follows:

- Depth of window: 0.10

- Outer reveal: 0.09

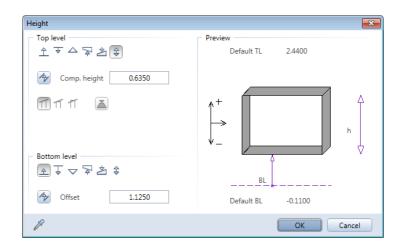


- 12 Click OK to confirm.
- 13 Enter the width of the opening in the dialog line: 1.26.
- 14 Press ENTER to confirm.
- 15 Draw a window using exactly the same settings in the opposite wall.



16 Set the next point for a window opening in the exterior wall on the right and, in Properties, click Height and change the height parameters for the top level and bottom level (height of sill):

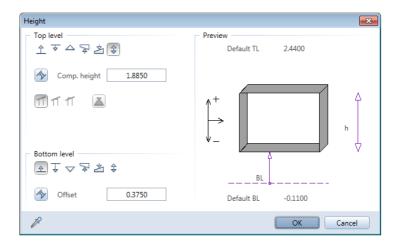
- Top level area:
 - Fixed component height = 0.6350
- Bottom level area:
 - Relative to lower plane = 1.1250



Keep the same settings for the other windows in the exterior wall on the right.

17 Draw more window openings in the exterior wall on the left. Change the height parameters for the Top level and the Bottom level again:

- Top level area:
 - Fixed component height = 1.8850
- Bottom level area:
 - Relative to lower plane = 0.3750

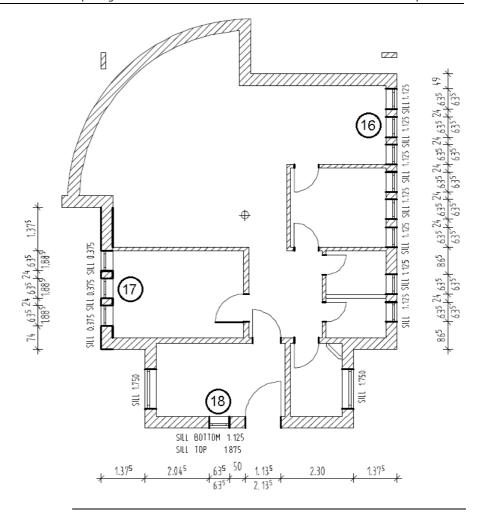


18 Draw two window openings above each other in the front entrance.

To do this, create two openings in the same place but with different settings for BL relative to lower plane: First opening: 1.125; second opening: 1.875.

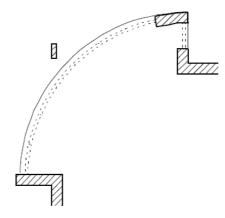
The component height in each case is 0.635.

(See illustration)



Inserting window openings in the curved wall

Next you will insert windows in the curved wall and in the adjacent straight wall.



Due to the curve, you can only define the **depth of window** and the **outer reveal**; the **inner reveal** is calculated by the program.

Openings in curved walls may be created so that the reveal edges are radial or parallel (Options, Components and architecture page, Openings area). For this building, you will use the Radial setting, which is the default.

Tip: If the arrow indicating the nearest reference point is not displayed, you have most likely snapped the start point of one of the segments in the curved wall. In this case, press ESC, zoom in even closer and try again.

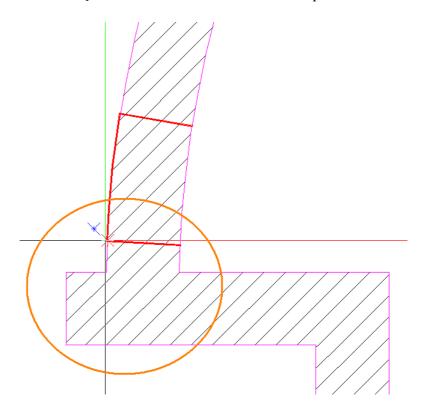
To make things easier, open the Point snap options and select the Display point snap symbols option in the Point snap representation area.

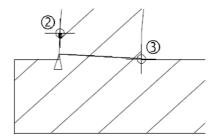
Make sure that the Element symbol is displayed (not (End)Point!)

For the purposes of the exercise, you will start by creating the window openings without smart symbols – these can be inserted later, in the exercise following this one.

To insert window openings in the curved wall

- **⊃** The Window tool is still active. If it isn't, activate it now.
- 1 Use Soom Section to get a close-up view of the bottom left of the curved wall.
- 2 Click the line representing the outside of the curved wall.
 - Make sure that you do not snap a point (see Tip)!
 - Pay attention to the direction in which you enter the opening: the closed side of the preview has to point towards the outside. If required, use a to select another anchor point.





3 Click the inside corner of the curved wall.

In the view showing the corner in detail, you should notice how the reference point has moved.

A perpendicular has been dropped from the corner to the line representing the outside of the wall.

- 4 Enter the offset: **0**
- 5 Click Properties.
 Click in the Library element 1 to n area and set the Representation of sill to Outside.

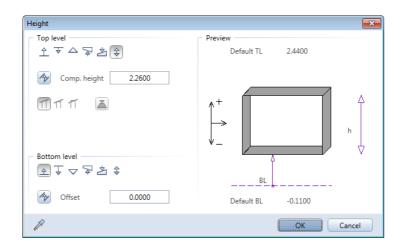




Tip: Make sure that the

Offset to reference point icon is pressed in in the dialog line; otherwise, you cannot confirm the value 0.000 by pressing ENTER.

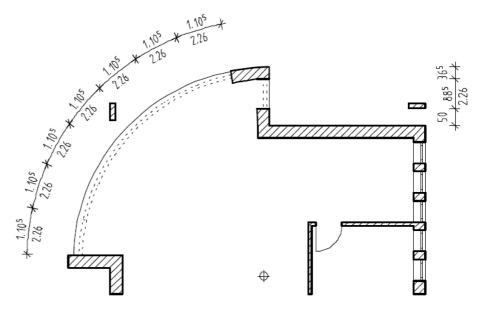
- 6 Click Height and enter the following values:
 - Top level: Fixed component height: 2.26
 - Bottom level: A Relative to lower plane: 0



- 7 Click **OK** to confirm the dialog boxes.
- 8 *Set properties, end point or offset to end of opening* Enter the opening width: 1.105
- 9 Set properties or click a line of an exterior wall
 Point exactly to the end point of the first opening and confirm
 the Offset to reference point = 0.000 displayed in the dialog
 line by pressing ENTER.
- 10 Place new reference point or enter offset to the current one Open the shortcut menu (right mouse button) and click Last point. Then press ENTER to confirm the offset of **0.000** displayed in the dialog line.
- 11 *Set properties, end point or offset to end of opening* Confirm the opening width (1.105) displayed in the dialog line.

Tip: This opening requires a high degree of precision when clicking points. Zoom in as close as you can and click the points exactly to avoid the risk of snapping to a point in a segment of the circle.

- 12 Repeat these steps (steps 10 to 12) to create five more openings so that a large opening (made up of 7 openings) is generated.
- 13 Insert another opening in the short wall that meets the top of the curved wall. Please check that the Sill is still set to Outside.
- 14 *Set properties, end point or offset to end of opening* Enter the opening width: **0.885**



15 Press ESC to quit the tool.

Defining the reference point

To change the position of the small arrow representing the nearest significant reference point, you can

- set another point on the wall
 - 0r:
- click a point beyond the wall. The reference point will move to the point on the wall that is perpendicular to the point you clicked.

The reference point arrow indicates the direction in which the distance between it and the small square is measured. This value is always a positive value, regardless of the axis direction. By entering a negative value, it is possible to mirror the direction of measurement.

Inserting SmartParts

The next step is to insert window SmartParts in all window openings (except the floor-to-ceiling openings).

You will use single-casement windows for the detached house in our example. You can model your own SmartParts for openings using the Window SmartPart, Door SmartPart, Shading SmartPart, Domed Roof-Light SmartPart tools. You can then save the finished SmartParts to the SmartParts library. So that you can start inserting SmartParts at once, the Project folder includes a favorite file with the required settings for a window SmartPart.

To insert SmartParts

- **⊃** Drawing file 100 Ground floor model is open.
- The reference scale is still set to 1:50.
 In order to display the window SmartParts and smart window symbols in greater detail, you are temporarily working at a larger scale.
- 1 Click Window SmartPart (Tools palette, Create area in the Basic: Walls, Openings, Components module).

The Properties palette opens and you can see an empty window frame. Now you can design your own window SmartPart step by step. The project folder contains a favorite file with a window SmartPart defined in this manner.

Tip: Detailed information on modeling the Window, single casement SmartPart is provided in the step-by-step guide entitled "Windows and Doors". As a Serviceplus member, you can download this guide in PDF format from Allplan Connect: go to the Training - Documentation area (http://connect.allplan.com).

2 Click Load favorite, open the Project folder and select the Window_single_casement.smv favorite file.

The saved values and settings are read into the Properties palette.

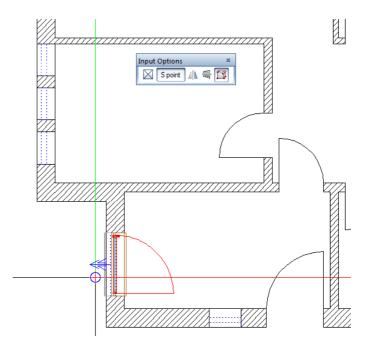
3 If you want, you can open the individual tabs and check the settings. So you can see how the SmartPart is designed.

The SmartPart is attached to the crosshairs at its drop-in point. The drop-in point is the bottom left corner of the SmartPart. As soon as you point to a wall opening, the preview adapts to the outline of this opening.

- 4 Zoom in on the bottom left corner of the building.
- 5 Move the crosshairs with the attached SmartPart into the window opening at bottom left.

The SmartPart automatically adapts to the size of the opening. If you move the crosshairs to the other side of the opening, you can see how the position of the SmartPart changes.

6 As soon as you have found the appropriate position (as shown below), click in the workspace with the left mouse button. You have now placed the first SmartPart.

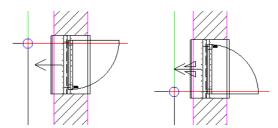


Notes: If you have created the opening with a reveal (as is the case in this example), the SmartPart is always placed in the middle of the reveal. It is irrelevant where you click the opening. If there is no reveal, the program places the SmartPart SmartPart in such a way that it is centered in the wall layer clicked.

The input options provide a number of tools you can use to do this.

You can specify an angle of rotation in the dialog line. The SmartPart is then placed at this angle.

When you place the SmartPart, an arrow appears in the middle of the SmartPart. This arrow indicates the outside of the SmartPart. Depending on the position of the SmartPart within the opening, you can see another symbol. This symbol indicates that the SmartPart is mirrored before it is placed.



Note: You can set the size and color of these symbols using the Size of CursorTips for snap points and Color of CursorTips options you can find in the **Options** (Default toolbar), Point snap page, Point snap representation area.

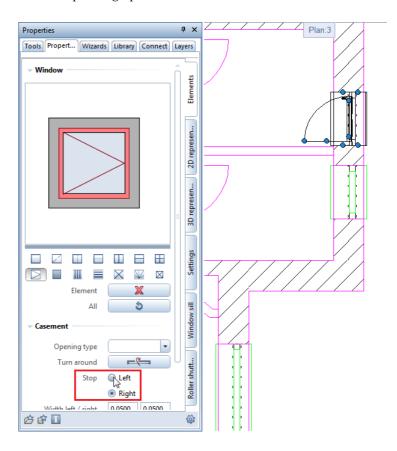
The tabs of the SmartPart provide numerous parameters you can use to modify the SmartPart itself and the manner in which it is displayed. By assigning layers, you can control the visibility of the individual window elements separately in 2D and in 3D. Take the Window, single casement SmartPart as an example: the window elements are on the AR_WIND layer and the opening symbols are on the AR_SWING layer. Do not change this setting.

7 Press ESC to finish.

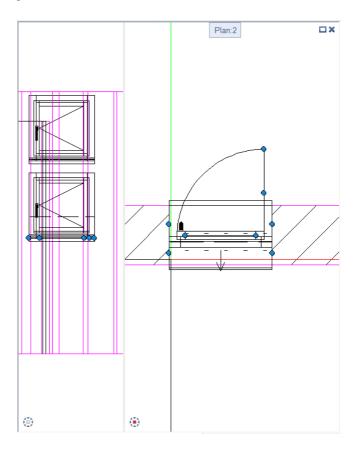
A copy of the SmartPart you just placed is attached to the cross-hairs.

8 Place more SmartParts as shown below. You can ignore the openings in the curved wall and the floor-to-ceiling opening to the right of the curved wall for the time being. You will insert smart symbols in these openings in the next step.

The opening symbols of the windows are displayed in plan when you place the SmartParts. To change the opening direction, select the corresponding option on the Elements tab.

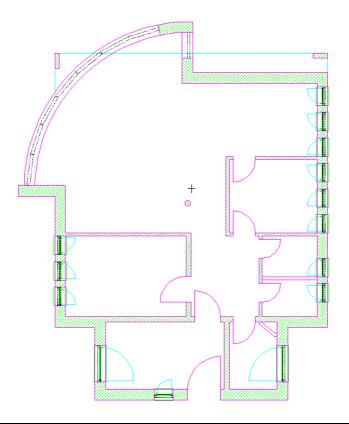


9 When inserting the window SmartParts in the two window openings that are above each other to the left of the entrance door, you need to make sure that the SmartParts really snap into place. The easiest way to check this is to view this section of the floor plan in Front, South Elevation.



10 After you have inserted all SmartParts, press ESC to quit the tool.

Set the AR_SWING layer to visible in the Layers palette. The following should now be displayed on your screen:



You can now save the new SmartPart in the Project or Office folder of the SmartParts library.

Save the SmartPart in the library

- 1 Click the SmartParts folder in the Library palette.
- 2 Open the Project or Office folder. If you have selected the Project folder, open the project where you want to save the SmartPart.
- 3 Click PNew group at the bottom of the palette.
- 4 Enter a name for the group: Windows. Press ENTER to confirm.

The Windows folder is created.

- 5 Open the Windows folder and click Insert SmartPart at the bottom of the palette.
- 6 Enter a name for the SmartPart: Window, single casement. Press ENTER to confirm.
- 7 Click one of the SmartParts you have placed.

The SmartPart is saved in the library; it is automatically given a standardized preview for windows.

Inserting smart symbols

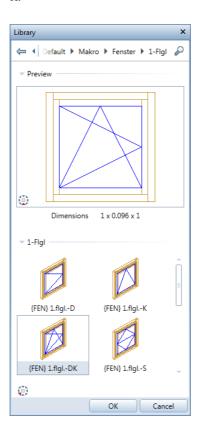
The remaining floor-to-ceiling windows will be given smart symbols.

To insert smart symbols

- **⊃** Drawing file 100 Ground floor model is open. The reference scale is still set to 1:50.
- 1 Click Insert Smart Symbol, SmartPart in Opening (Tools palette, Create area in the Basic: Walls, Openings, Components module).
- 2 Click Library in the input options.
- 3 Open the following folders one after the other in the Library palette:

Smart symbols - Default - Smart symbol - Basic symbols - Windows.

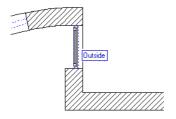
4 Select the smart window symbol Fen 1 flg DK by double-clicking it.



Tip: You can use the viewing settings in the **Preview** of the palette to quickly view the smart symbol from all sides.

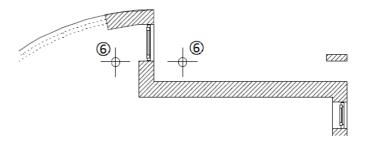
Using the smart symbol designer, you can define and save your own smart symbols, which you can then insert in various openings using the procedure described here.

5 First click the opening in the straight wall. It is best to click between the lines representing the reveal.This inserts the smart symbol in the opening. The exterior side is displayed to help you place it.



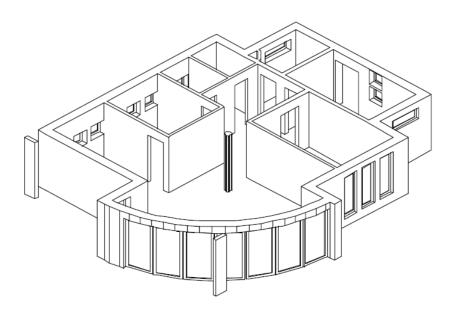
6 Zoom in to get a close-up view of the window and to check the position of the smart symbol. To define the window's direction of opening, click the exterior side of the opening.

7 When you have positioned the smart symbol correctly, click in the workspace with the right mouse button to confirm. The smart symbol is created; it gets the AR_SMSY layer.



- 8 Click the first opening in the curved wall and insert the smart symbol.
- 9 Insert the smart symbol in the other window openings. You will notice gaps between the smart symbols in the curved wall. This is because the smart symbol was defined in such a way that there is an offset between the details displayed and the edge of the reveal. You can see how the edges of the reveal in the curved wall are radial. As an alternative, you can define your own smart symbol.
- 10 Press ESC to quit the tool.
- 11 Set the reference scale back to 1:100.

Design in rear left isometric view:



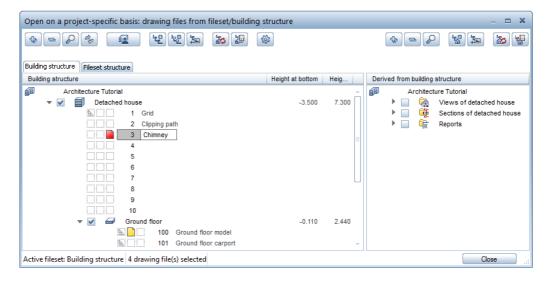
Chimney

We now need to insert a chimney for the heating system in the basement.

The chimney is a component which, in our example, applies to all four floors. Its bottom level is on the unfinished basement floor; its upper level is above the roof. Using the building structure, you can design components applying to all floors in one drawing file. For this purpose, we use a drawing file under the building structure level Detached house.

To place a chimney

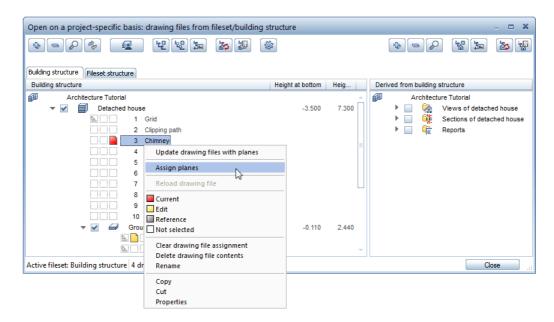
- 1 Click Open on Project-Specific Basis (Default toolbar or File menu).
- 2 Open drawing file 3. Name the file Chimney.



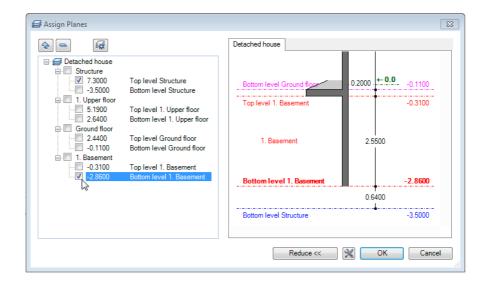
3 The planes of the building structure level Detached house (Default lower plane = -3.50 m and Default upper plane = 7.30 m) are automatically assigned to the drawing file 3 Chimney. Because the bottom level of chimney should be on the unfinished basement floor, you can now assign the height to the drawing file.

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Open the shortcut menu of drawing file 3 Chimney and click Assign planes.

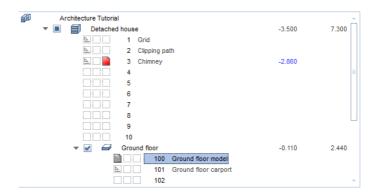


4 In the Assign planes dialog box, select Top level of building (7.30 m) for Default upper plane and Bottom level of basement (-2.86 m) for Default lower plane.



- 5 Click **OK** to close the **Assign planes** dialog box.
- 6 Click **OK** to confirm the **Behavior of drawing files** dialog box without selecting an option.

The selected heights are assigned to drawing file 3 Chimney.



7 Make drawing file 3 Chimney current and set 100 Ground floor model to reference mode. Close the dialog box.

Have a look at the viewport with the front, south elevation. You can see the default planes of drawing file 3 Chimney, which is open in edit mode, and drawing file 100 Ground floor model:

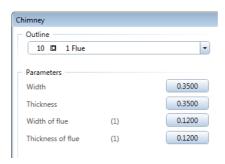


8 Click Chimney (Tools palette, Create area, Basic: Walls, Openings, Components module).

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9 Check the Format toolbar to see if the layer AR_CHIMN is selected. If it isn't, select it now.

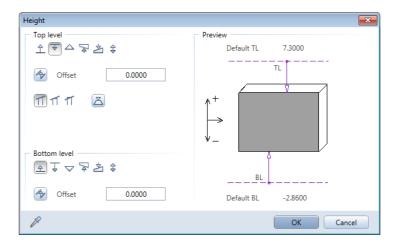
- 10 Click Properties and select the chimney type 10.
- 11 Enter the following dimensions:
 - Parameters area:
 Width = 0.3500
 Thickness = 0.3500
 Width of flue = 0.1200
 Thickness of flue = 0.1200



12 Assign a trade, material and calculation mode as you like and set hatching to off.

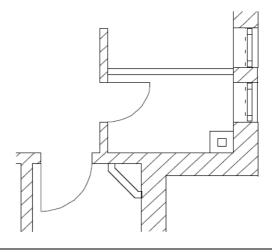
13 Define the height.

At 2.86m, the top level of the chimney is at the height of the unfinished basement floor. Its top level is for the moment attached to the total building height of 7.30 m defined in the building structure.



- 14 Click **OK** to confirm the dialog boxes.

 Set the anchor point to **A** bottom right.
- 15 Place the chimney in the bottom right wall corner and press ESC to quit the tool.



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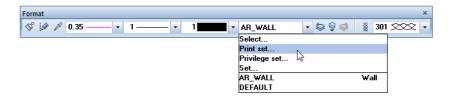
Checking the design

If you want to check the design, switch to the Animation view type. You can find this setting on the viewport toolbar of each viewport.

To check the design in animation mode

- Make drawing file 100 Ground floor model current and open drawing files 3 Chimney and 101 Ground floor carport in edit mode.
- 1 Open the Layers palette and click Select Layer Print Set at the bottom of the palette.
- 2 Select the Model print set in the dialog box and click **OK** to confirm.

Note: You can also select the print set on the Format toolbar by clicking Select, Set Layers and then Print set....



Another option is to select the Select, Set Layers tool (Format menu). Open the Print Set tab, select the print set Model in the list box and click OK to confirm.

- 3 On the Window menu, click 1 Viewport.
- 4 Select Rear Left, Northwest Isometric View on the viewport toolbar.

5 Select the Animation view type on the viewport toolbar.



6 On the viewport toolbar, click A Navigation Mode to switch it on.

You can now use the mouse to navigate through the building.

In **sphere mode**, the observer moves around the object on the surface of an imaginary sphere.



Turns the camera about an object on the surface of an imaginary sphere.

Middle mouse button:

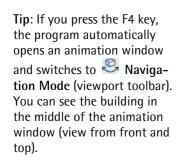
Moves the camera to the left/right and up/down on a linear path.

Right mouse button:

"Zooms"; moves the camera forward and backward.

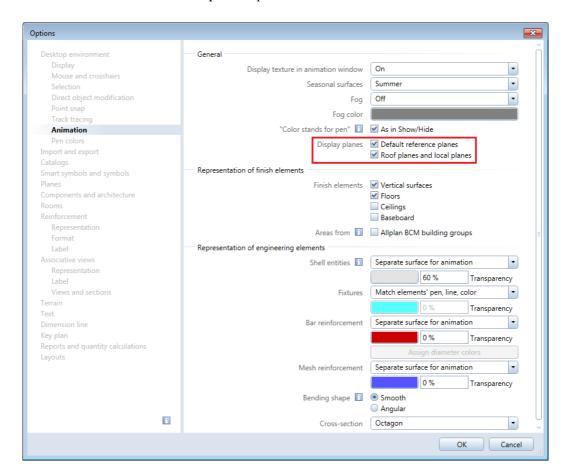
7 In animation, you can see a virtual ground plane. In order to define it more precisely or switch it off, use Surroundings (on the shortcut menu or in the Animation module).

If you want to see the default planes, too, click Options on the Default toolbar.



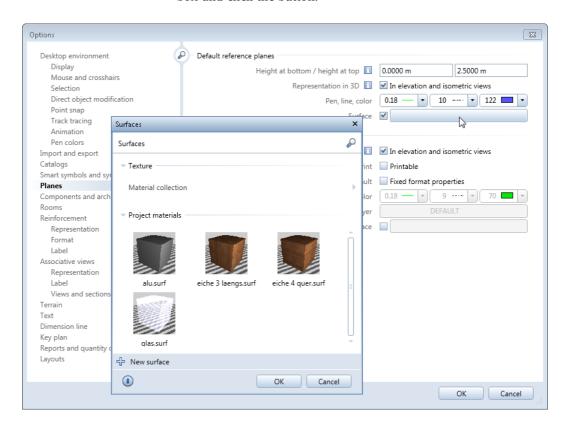
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8 Open the Animation page, go to the General area and select the Display default reference planes and Display roof planes and local planes options.



- 9 Click **OK** to close.
- 10 To make the planes transparent, select the **X** Options again. This time open the Planes page.

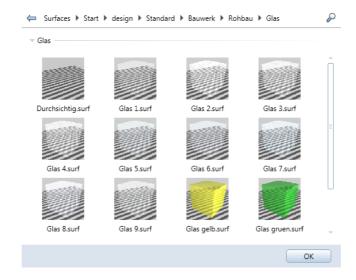
11 In the **Default reference planes** area, select the **Surface** check box and click the button.



12 Select the Glass.surf file.

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If you cannot find the Glass.surf file in the Surfaces used in project area, click Surfaces library. Open the Office- Default - Building - Shell - Glass folders one after the other. Select the Glass.surf file. The program automatically copies this file to the Design folder of the project standard. You can now find it in the Recently used surfaces area.

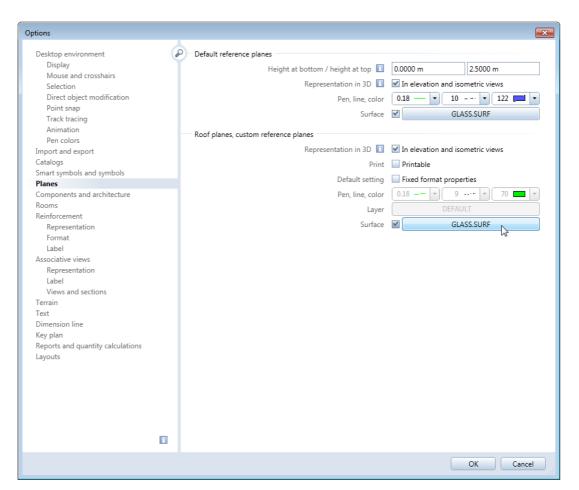


13 Click **OK** to close the **Surfaces** dialog box.

14 Make the same settings in the Roof planes, custom reference planes area.

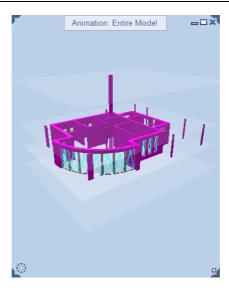
Here, you can now find the Glass.surf file in the Materials used in project area.

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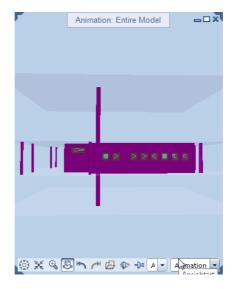


- 15 Close the Options.
- 16 Click Restore 3D View (Tools palette, Change area, Basic: Walls, Openings, Components module).

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Now you can see the default planes in the animation window. It is easy to identify which component is attached to which plane.



17 In order to quit animation, select the Wireframe view type on the viewport toolbar.

Switch to !! plan view.

Completing the design

You will now complete the floor plan with the outline of the slab over the columns, the carports and furniture. To do this, you will use the 2D drafting tools.

It is a good idea to keep 2D information and architectural components in separate places. Consequently, you will use the layer 'DE_GEN01' for 2D designs.

First, draw the outline of the slab over the columns so that the slab extends beyond the walls. You will use a different pen and line type to do this. The outline of the slab is placed on the layer DE_GEN01.

Tip: You can also press CTRL+4 to select layers.

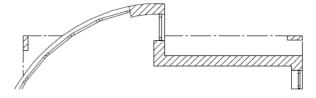
If no tool is activated, just double-click in the empty workspace with the right mouse button.

To draw the outline of the slab

- ⇒ In the Tools palette, select the Basic family. Open the

 Draft module.
- 1 Open the Layers palette and click Select Layer Print Set at the bottom of the palette.
- 2 Select the PR Design print set in the dialog box and click OK to confirm.
- 3 Switch to the Tools palette and click / Line (Create area).
- 4 Make layer DE_GEN01 current (Format toolbar), and select pen (7) 0.13 and line type 11.
- 5 Click Enter at right angles (dialog line) and draw the floor slab using the columns as a guide.

The easiest way to join the lines with the edge of the sill is using Intersect 2 Entities (Change area).



Carports

You will draw the outlines of the slabs for the carports as a 2D design in drawing file 101. They will also be placed on layer DE_GEN01.

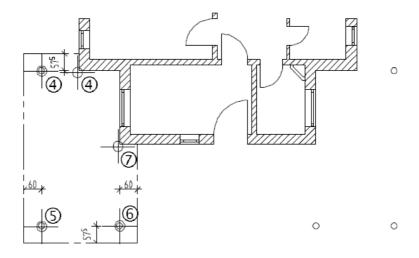
To draw parallel lines

The Draft module is open.

Make drawing file 101 Ground floor carport current and set 100 Ground floor model to reference mode.

Close all the other drawing files.

- 1 Click Offset Polyline (Create area) and if necessary make layer DE_GEN01 current.
- 3 Select pen (8) **0.18** and line type **8** for the outline of the carport (Format toolbar).
- 4 Click the corner of the house and then the center of the column. A preview of the parallel line used to 'enclose the entities' is displayed at the specified offset.
- 5 Change the offset to **0.6** and click the center of the column at bottom left.



Tip: Offset Polyline: You can change the side on which the polyline is created at any time by clicking Left or Right in the input options.

- 6 Change the offset to **0.575** and click the center of the next column.
- 7 Change the offset to **0.6**, click the corner of the house and press ESC to finish drawing the polyline.
- 8 Draw a further parallel polyline for the area with the offset **-0.15**. Select pen (2) **0.35** and line type 1 and the same sequence of points.

You will create the second carport by mirroring and copying the first one. Now it is a good idea to use track tracing.

In this exercise you will also learn to use the filter tools. You can use these to selectively activate elements in an area.

To mirror and copy the carport

1 In the Filter Assistant toolbar, click Filter elements based on element type and select Line. Enclose the carport in a selection rectangle.

The polylines are displayed in the selection color.

- 2 Click Copy and Mirror on the Edit toolbar.
- 3 1st point of mirror axis:
 Switch on track tracing by pressing the F11 key or clicking
 Track line in the dialog line.

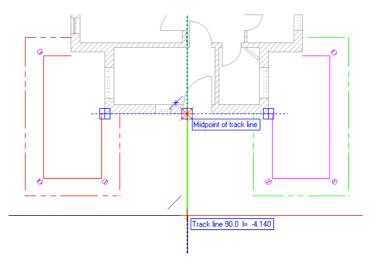
The center of the facade at the front of the building will serve as the first point for the mirror axis.

Tip: Alternative option to define the midpoint: Click in the workspace with the right mouse button to open the shortcut menu. Choose Midpoint and click the left and right corners of the house with the left mouse button.

Point to the left corner of the house. The first track point is displayed.

Point to the right corner of the house. The second track point is displayed.

Position the crosshairs roughly midway between the two track points so that the midpoint of the track line is displayed. Click this point.



The mirror axis needs to be parallel to the y axis.

4 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 facade at the front of the building). Move the crosshairs roughly at a 90-degree angle above or below the first point of the mirror axis. The 90-degree track line appears. Click this line wherever you want.

This creates a vertical mirror axis and the selected elements are mirrored and copied.

The lines of the second carport displayed in the preview are placed correctly.

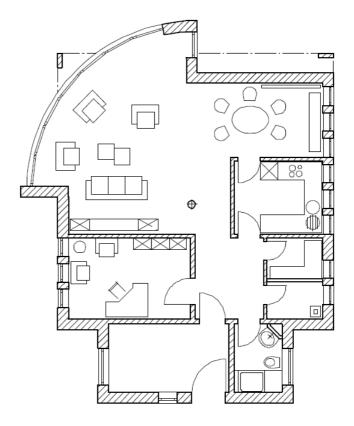
5 Press F11 to switch track tracing off again and press ESC to quit.

Furniture

You can draw the furniture for the ground floor yourself.

Use the tools in the Draft module and the DE_FURN layer. Sanitary objects get the DE_SANY layer. This way, individual layers can be conveniently transferred to the specialist planner. If you have installed the "Basic Symbols" and "2D Architecture" symbol libraries, you can also use the furniture symbols in there.

When furnished, the ground floor might look like this:



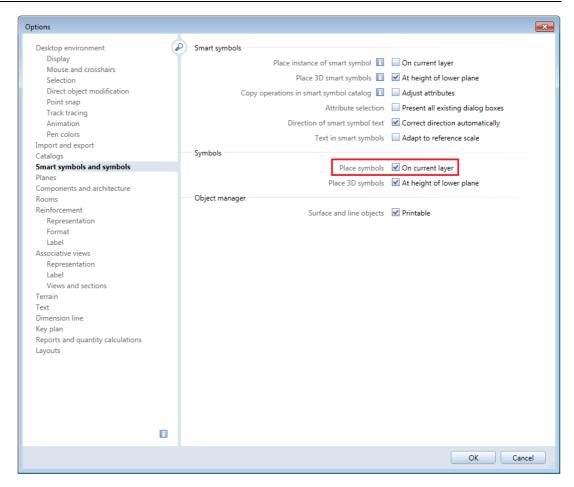
Symbols and layers

When you place symbols, they usually get the layer on which they were drawn. The elements in a symbol can also reside on different layers. When you use symbols provided by partner offices, the layers of the symbols are usually unknown.

To avoid changing layers frequently, you will now select the Place symbols on current layer option in the **30** Options. When selected, all symbols get the layer that is currently active, regardless of the layer(s) on which they were drawn.

To specify the layer for symbols

- 1 Click **3** Options (Default toolbar) and open Smart symbols and symbols page.
- 2 In the Symbols area, select the Place symbols on current layer option.



3 Click **OK** to confirm.

Modifying layers

If you find that elements are on the wrong layer, you can move them to a different layer at any time. The following section shows how to assign a different layer to these elements.

Note: Symbols are saved as entity groups in Allplan. An entity group is a group of elements which can be addressed and manipulated as a whole. To address a symbol or group in a single step, click the symbol with the middle and then left mouse button. This mouse button

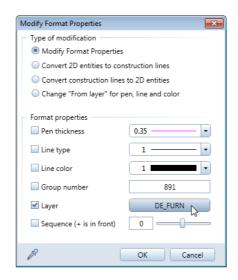
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combination selects entity groups, that is a group of elements. You can also select entity groups by clicking while pressing the SHIFT key

Tip: You can also modify the layer of an individual element using **Format Properties** on the shortcut menu. However, this approach does not modify linked elements (e.g. window openings in walls).

To modify layers

- 1 Click Modify Format Properties (Edit toolbar).
- 2 Click the Layer button. Double-click DE_FURN or select it using the shortcut menu and confirm your selection.



3 Select the symbols to be placed on the DE_FURN layer.

To do this, open the Brackets (Filter Assistant toolbar) and click each symbol using the middle followed by the left mouse button.

Then close the **Brackets** again.

Dimensions and Labels

A tool is used for dimensioning architectural elements. This tool will create complete, associative dimension line blocks.

The tool provided is Dimension Walls in the Basic: Walls, Openings, Components module. 'Associative' means that all dimension lines are updated automatically to reflect any changes you make as you go along.

Dimension lines, sill height and elevation specifications are each assigned to a separate layer. Having all the elements in the same drawing file ensures that the associativity is not lost.

The dimension lines for the building are in drawing file 100. The carport dimensions are in drawing file 101.

You will find an illustration of the dimensioned floor plan at the end of this chapter.

Dimensioning walls

In the following exercise you will create associative dimension line blocks for the walls.

Tip: To see better what you are doing, you can hide the furniture and sanitary layers using the Layers palette or the Select, Set Layers

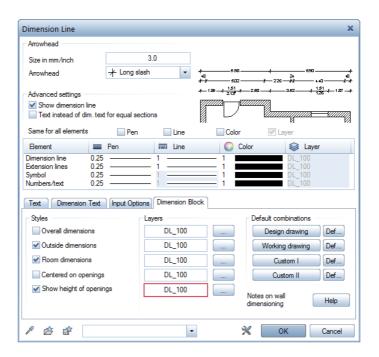
tool.

To dimension walls

- **○** Make drawing file 101 Ground floor model current and set 100 Ground floor carport to edit mode.
- 1 Click Dimension Walls (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area).
- 2 Click Properties.
- 3 Leave the settings from the last dimensioning operation for Arrowhead, for the Format properties and in the Text, Dimension Text and Input Options tabs.

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- 4 Select the **Dimension Block** tab and select the following check boxes for the vertical dimensions:
 - Outside dimensions
 - Room dimensions
 - Show height of openings
- 5 Each dimension string type can be assigned its own layer. Assign the layer DL_100 to all dimension strings.



Tip: You can save four dimension string combinations as standard combinations.

- 6 Click OK to confirm.
- 7 Click the vertical exterior walls you want to dimension on the right.

The walls will appear in the selection color as you select them. Make sure you select them all.

8 Right-click in the workspace with the right mouse button to confirm. (Adjacent interior walls will also be dimensioned automatically.)

- 9 Active wall line as direction element Click a vertical line on the edge of one of the walls selected to define the direction of dimensioning.
- 10 Place the dimension block in the workspace.
- 11 If necessary, change settings for the dimension strings in Properties and dimension the other walls.
- 12 Make drawing file 101 current, open drawing file 100 in edit mode and dimension the carports.

Note: Before placing the dimension line block, you can use Flip dimensions in the input options to invert the arrangement of the dimension lines. When Offset to drop-in point is on, the offset at which the dimension line block is attached to the crosshairs corresponds to the spacing between the individual dimension lines in the block. You can thus append the next dimension line block "seamlessly".

You can customize the dimension blocks for your needs. Open the Tools palette, select the Basic family and open the Dimension Lines module.

- Add Dim. Line Point (Change area)
- K Del. Dim. Line Point (Change area)
- To alter height specifications, use Modify Component Height, Additional Text (Change area). This tool is required to change the height specification for the window openings in the entrance.
- To dimension the openings in the curved wall, use Curve Dimensioning (Create area). When you do this, you will have to work carefully as the points to be dimensioned the endpoints of each opening, which also serve as the start point of the next opening are not visible on the outside edge of the sill. However, the points do exist and can be dimensioned.

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Sill height

You can use the Sill Height and Elevation Point tools to label your design or just as a means of checking that the elements you entered were created correctly.

These tools will create "intelligent" labels, that is, labels that will update automatically to reflect any changes you make. You must click the openings in plan view.

Note: The exponent format is based on the setting you have made in the Dimension Line Parameters, Dimension Text tab.

To calculate the sill height automatically

- **○** Open drawing file 100 Ground floor model again.
- 1 Click a corner of the window opening with the right mouse button and on the shortcut menu, select

Sill Height. (You can also find this tool in the Architecture family, Basic: Walls, Openings, Components module, Create area.)

- 2 Activate the layer AR_SILLE.
- 3 Select Vertic(al Text) in the input options. This defines the text direction.
- 4 Click Prefix on the context toolbar and enter SILL. (This will appear in front of the value).



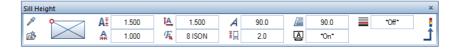
- 5 Switch to the text parameters and set the following values:
 - Text's anchor point: top left
 Text height = 1.500
 Text width = 1.000

Aspect = 1.500

Font: 8 ISONORM DIN 6776

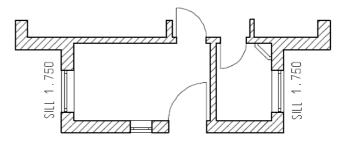
Leave the other settings as they are.

Tip: If you want to use the finished floor as the basis for the sill height specification, enter the height of the floor in the **Delta BL** box.



6 Place the label beside the window.

The height from the lower default reference plane to the sill is measured.

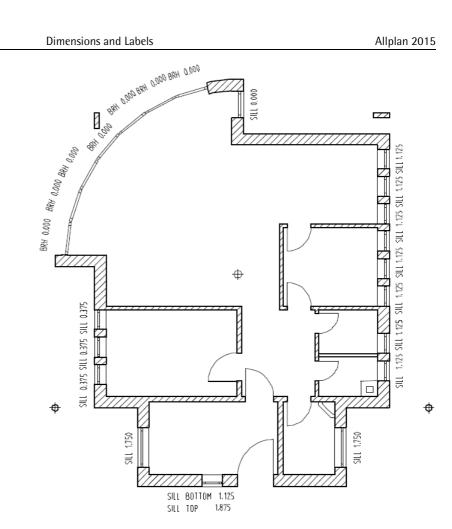


7 Create labels for the other window sills. Check the text direction each time.

For the curved wall, set the text direction to Angle and click a line on a smart symbol to match its angle.

Tip: When you click congruent openings in plan view, only one opening is identified (usually the lower one). There are two ways to enter the other sill height: Click the opening in isometric view or switch to the tools in the Text module and enter the height of the sill manually. Use to match the existing text's parameters.

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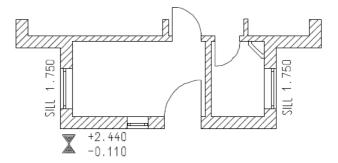
8 Press ESC to quit the tool.

You can use the Align Text tool (Tools palette, Basic family, Text module, Change area) to align vertical sill labels. Press F1 for detailed information on this tool.

You can use the Elevation Point tool (Tools palette, Architecture family, General: Roofs, Planes, Sections module, Create area or shortcut menu) to place elevation specifications in the same way. With this tool, you can also define the symbol used for the upper and lower elevation marks.

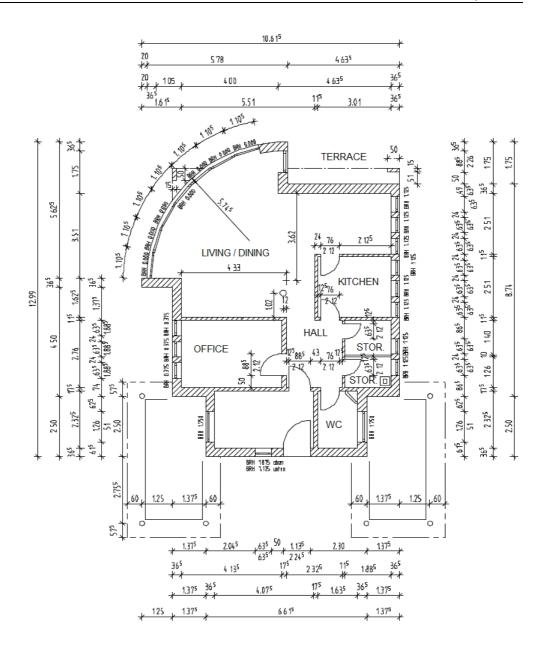
Tip: Check that the correct layers are visible.

The following illustration shows the elevation specifications for a wall.



The floor plan of the ground floor should now look like this. The room identifiers are on layer TX_100.

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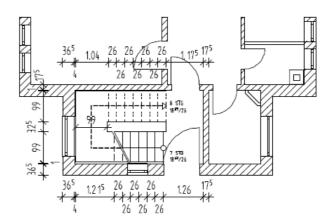


Stair outline

To draw the stair outline

- **⊃** The drawing file **100** Ground floor model is open.
- 1 Activate the layer DE_GEN02 and use Line, Rectangle and Parallel Lines (Tools palette, Basic family, Draft module, Create area) to draw the stringers and the steps.
- 2 Use Perpendic. Bisector (Tools palette, Basic family, Draft module, Create area) and Line to draw the line of travel.
- 3 Use Line, Circle and Delete Segment of Line (Tools palette, Basic family, Draft module, Change area) to draw the symbols for the top and bottom of the stair.
- 4 Use Line to draw two lines representing the clipping path and delete redundant line segments with Delete Segment of Line.
- 5 Change the line type using Modify Format Properties (Edit toolbar) and the Brackets.

Check the offset to the walls. Use the options provided for snapping to points and entering offset values.



Slab

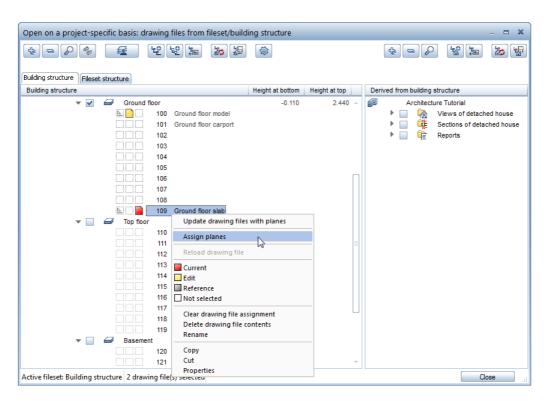
Tip: You can also use the Slab tool to create floor slabs.

A separate set of tools is provided for designing foundations.

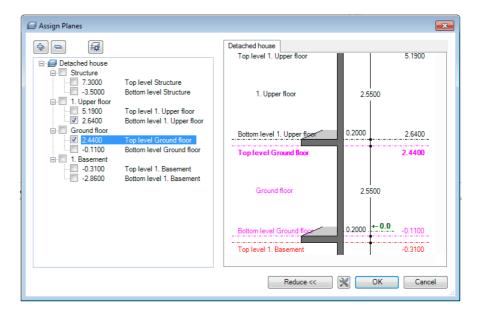
The ground floor is still missing the slab. You will draw this slab on a separate drawing file. As with walls, start by entering the properties and then draw the outline of the slab.

To set the slab's properties

- 1 Select 🛅 Open on a Project-Specific Basis.
- 2 Open drawing file 109. Name the file Ground floor slab.
- 3 Open the shortcut menu of drawing file 109 Ground floor slab and click Assign planes.

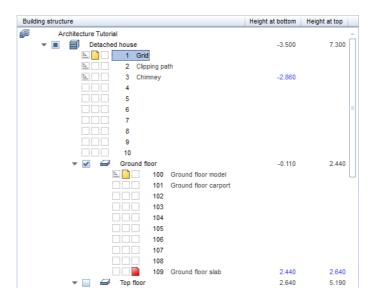


4 The ground floor slab is between the Top level of ground floor and Bottom level of top floor. Select these two planes in the Assign planes dialog box and click OK to close.



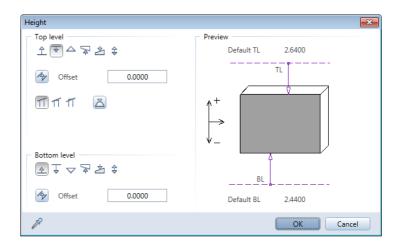
5 Click **OK** to confirm the **Behavior of drawing files** dialog box without selecting an option.

6 Make drawing file 109 Ground floor slab current and set 1 Grid and 100 Ground floor model to edit mode.



- 7 Open the Layers palette and click Select Layer Print Set at the bottom of the palette.
- 8 Select the SC Entry print set in the dialog box and click OK to confirm. (This way, the grid layer should be visible.)
- 9 Click Slab (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area) and activate the layer AR_SLAB.
- 10 Select pen (2) 0.35 and line type 1 (Format toolbar).
- 11 Click Properties.

12 Set the height as follows:



The bottom level of the ground floor slab is positioned on the Top level of ground floor (2.44 m) and its top level on the Bottom level of top floor (2.64 m). The thickness of the slab is 20 cm. This sets the slab flush with the upper and lower default reference planes.

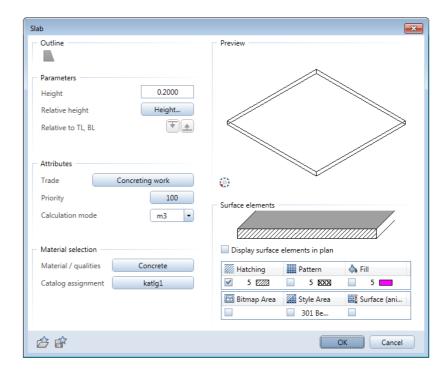
13 Click **OK** to confirm and enter the other properties as follows:

• In the Attributes area: Trade: Concreting work

Priority: 100

Calculation mode: m³

Material selection area:
 Material / qualities: B25

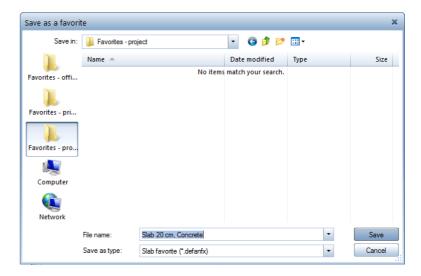


Saving component properties as favorite files

As is the case with all component settings, you do not need to specify the slab properties from scratch each time but you can save combinations of settings as favorite files.

To save component properties as a favorite file

- ⇒ The Slab tool is still active and the dialog box is open. If it isn't, select this tool and click Properties.
- 1 In the bottom left corner of the dialog box, click Save as a favorite.



2 Select the Favorites - project folder, enter a name and click Save to confirm.

The next time you need a slab with these settings, click $\stackrel{\frown}{\triangle}$ Load favorite and select the file:

The values in the dialog box will change automatically.

Entering the outline of the slab using the polyline entry tools

You will now define the position of the slab The layers will be useful to define the corners and delimiting points along the outline of the slab.

To trace the outline of the slab along the shape of the curved wall, you will use the polyline entry tools.

Polyline entry tools

You can use these tools to enter any outline.

Polygonize entire element: the start point also serves to specify the direction. You can specify the number of segments for circles and curves.

Define area of element to polygonize: generates a polyline based on a portion of an element. Define the portion by clicking a 'from' and a 'to' point.

Enter reference point: identifies a point on the element as the start point for the new element. To define this start point, click a point on the element and enter the offset between this point and the nearest significant point (displayed as an arrow).

Area detection using additional point: click a point on a polyline and the system will detect the entire boundary.

Area detection: 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 as at any time.

☐ Island detection, ☐ Inverse island detection: When ☐ Island detection is switched on, closed outlines within an area are detected and cut out automatically.

When you select Inverse island detection, closed outlines are not cut out but filled out with the selected surface element.

You can use these tools only in conjunction with Area detection using additional point and Area detection.

To force the polyline along the outline of the wall, you first need to get a close-up view of that area. Now you will enter the polyline of the slab.

To enter the outline of the slab

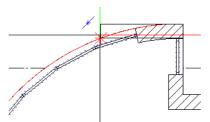
- The Slab tool is still active. Click with the right mouse button in an empty area of the work-space and select № Point snap options on the shortcut menu. In the Point snap area, select the Point of intersection option.
- 1 Click Multi in the input options to enter the polyline defining the outline of the slab in several steps.
- 2 Check that Polygonize entire element is active in the input options.

The settings should look like this:



- 3 Use Scom Section to get a close-up view of the area with the curved wall and click the first wall corner.
- 4 Point to the arc.

 Make sure that the curved wall is detected as a single element (displayed in the selection color, CursorTips:



Click the arc.

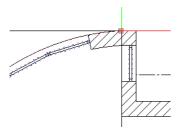
5 Polygonize entire element is active in the input options. Using this option, you can integrate an entire element, in this example it is the arc, into an outline polygon in a single step.

Tip: You can undo incorrect entries. The number of undo steps is unlimited.

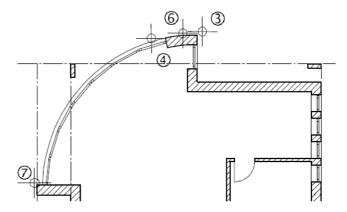
Just click **Back** in the input options.

6 Start point

Click the upper end point of the curved wall. Check that the end point of the curved wall is marked correctly.

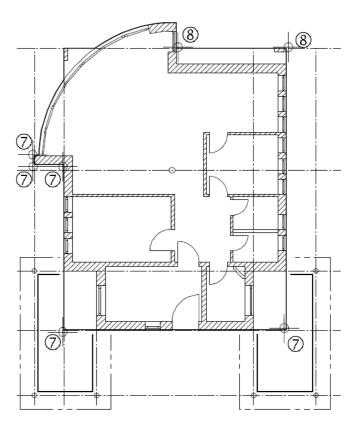


The entire arc is integrated in the polygon in one go. The next step is to enter the part of the slab that extends toward the column.



7 Change the viewpoint and use the corners and grid points to define the remaining points for the outline of the slab. The slab should rest exactly on the walls.

8 Click the corner of the column and the point of intersection between grid line and wall. Press ESC to finish entering the first polyline.



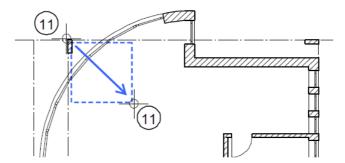
- 9 The slab is still missing the part that extends toward the column in front of the curved wall.
 - Click Plus in the input options to integrate this section into the polyline.



10 Use Section to zoom in on the area around the column and the curved wall.

11 Click the top left corner of the column, then click a diagonally opposite point within the curved wall and press ESC:

The rectangular section of the slab is created.



12 Press ESC to close the outline and quit the tool.

To adapt the size of the planes to your design, click Restore 3D View (Tools palette - Architecture family - Basic: Walls, Openings, Components module - Change area).

Press F4 to open the animation window and check the design.

Carport roofs

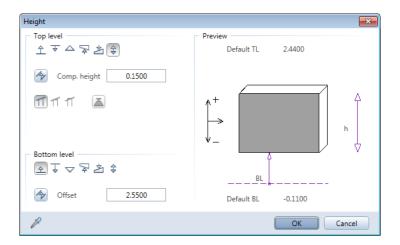
You will draw the carport roofs on drawing file 101. They connect seamlessly with the slab above the ground floor but they are thinner and of a different material.

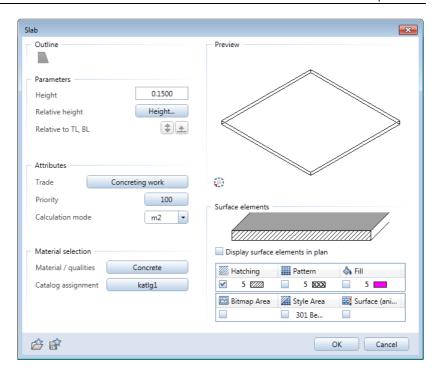
To draw the roofs over the carports

- **○** Make drawing file 101 Ground floor carport current and set 100 Ground floor model and 109 Ground floor slab to edit mode.
- 1 Click Slab again (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area).
- 2 Change the ✓ Properties including the Height.

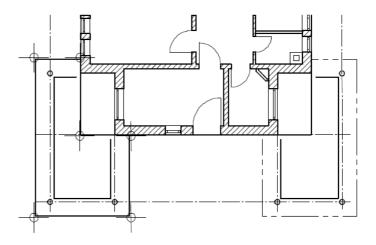
 The bottom level of the carport slab is positioned above the upper default level of 2.44 m (2.44 m + 0.11 m = 2.55 m) assigned to this drawing file.

The component thickness of the carport slab is 15 cm.

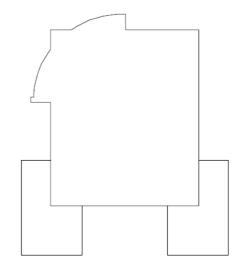




- 3 Zoom in on this area.
- 4 Click the corners of the roof outline one after the other and press ESC to close the polyline.



- 5 Draw the second carport slab in the same way.
- 6 Press ESC to quit the tool. Set the view type to Hidden line image; the floor plan should now look like this:



Slab opening

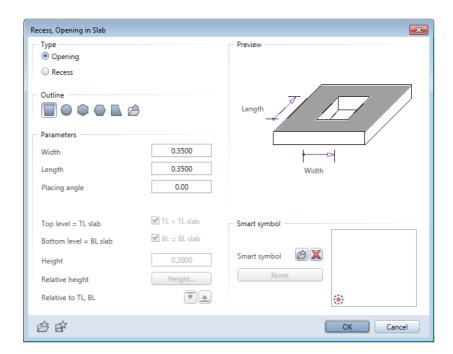
Next you will insert openings in the slab for the chimney and to provide access to the top floor.

Height settings are not required for openings in slabs as they always pierce the slab in its entirety.

To draw a rectangular slab opening

- → Make drawing file 101 Ground floor slab current and set drawing files 3 Chimney, 100 Ground floor model and 109 Ground floor carport to edit mode.
- **⊃** If the chimney is to be hidden, make the layer AR_CHIMN visible.
- 1 Click Recess, Opening in Slab (Tools palette Architecture family Basic: Walls, Openings, Components module Create area).
- 2 Click the ground floor slab.

- 3 Click Properties.
- 4 Select the icon for a **rectangular** opening and enter **0.35** for the length and width of the opening.



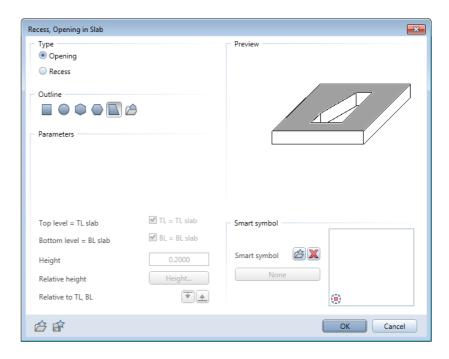
5 Set the anchor point to A bottom right and click the bottom right corner of the chimney.

You will use a freeform opening for the stairs. By opening the drawing file with the stair outline in reference mode, you will find it easy to enter the outline of the opening.

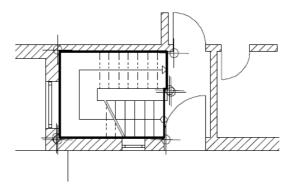
To draw a freeform slab opening

- **⊃** The tool is still active. Make the layer DE_GEN02 with the stair outline visible.
- 1 Click Properties.

2 Select the icon for a freeform opening.



- 3 Zoom in on the area around the stair.
- 4 Click the points on the boundary of the stair outline one after the other. To do this, click Lenter at right angles in the dialog line. The last point you click should coincide with the first.

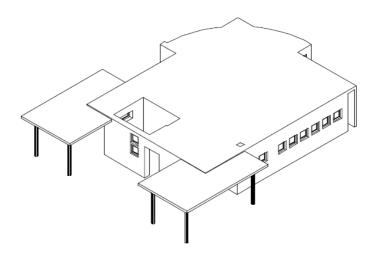


5 Press ESC to quit the tool.

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Tip: Slab openings and slab recesses are created in the same way.

Difference: slab recesses may have their own height setup as they do not pierce the slab entirely. Close drawing file 3 Chimney. Now the Front Right, Southeast Isometric View of the ground floor looks like this when you set the view type to Hidden line image:



Exercise 3: top floor

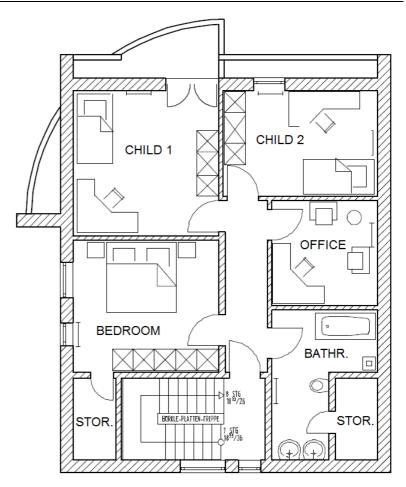
In this exercise you will make the top floor by copying the ground floor to relevant drawing files for the top floor and then raising these by the height of one story. You will also find out about some of the tools that you can use to make alterations to the floor plan of the top floor.

Objective

When you design the other floors in a building, you can

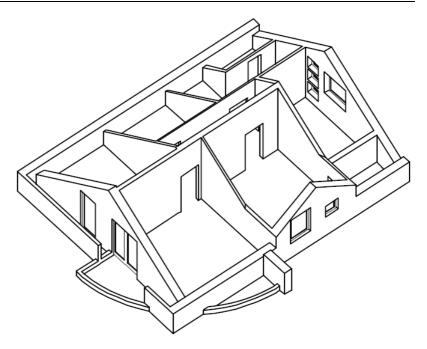
- Draw the elements from scratch or
- Copy and modify elements: copy elements from an existing floor to new drawing files and then make alterations.

In this tutorial, you will be employing the 'copy and modify' method.

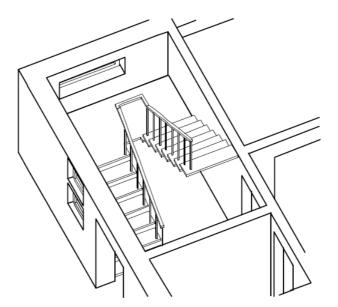


Floor plan of top floor

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Isometric view of the top floor (without the roof)



U-type stair from the ground floor to the top floor

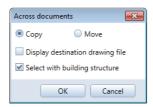
Copying components between documents

You will begin by copying drawing file 100 Ground floor model to drawing file 110 Top floor model.

Note: You can also copy drawing files in the building structure. All elements of the drawing file are always copied, including hidden and frozen layers.

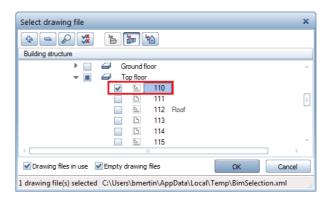
To copy components between documents

- **⊃** The Basic: Walls, Openings, Components module is still open.
- 1 Click Open on a Project-Specific Basis, select the Building structure tab and activate drawing file 100 Ground floor model. Close all the other drawing files.
- 2 Open the Layers palette and click List layers used in open documents on the shortcut menu.
- 3 Make the following layers modifiable: DE_GEN02, AR_WALL and AR_COL. Hide all other layers.
- 4 On the File menu, click Copy, Move Elements between Documents....
- 5 Select Copy, activate Select with building structure and click OK.



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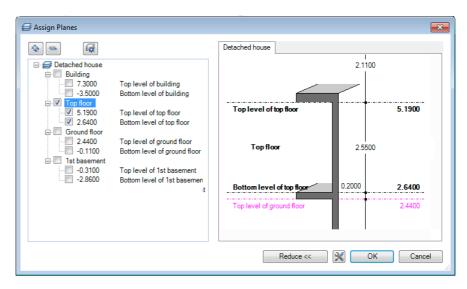
6 In the Select destination drawing file dialog box, click Building structure at the top.
Select drawing file 110 (check mark!).



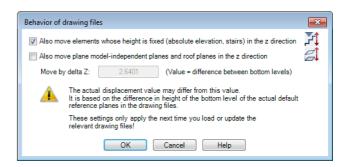
- 7 Click All in the input options.
- 8 Click Open on a Project-Specific Basis, open the Building structure tab and activate drawing file 110. Close all the other drawing files.
- 9 Rename drawing file 110 Top floor model. In order to do this, click Rename on the shortcut menu.
- 10 As you have created drawing file 110 Top floor model by copying, it has the same height as the Ground floor structural level. To adapt the height settings of the top floor, open the shortcut menu of drawing file 110 Top floor model and click Assign planes.

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11 Select the Top floor in the Assign planes dialog box.



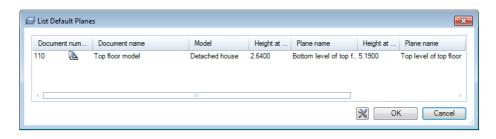
- 12 Click **OK** to close the dialog box.
- 13 Select the Also move elements whose height is fixed (absolute elevation, stairs) in the z direction option in the Behavior of drawing files dialog box and click OK to confirm.



The heights in file 110 Top floor model have been matched to the heights of the top floor.

14 Make drawing file 110 Top floor model current and close the Open on a project-specific basis: drawing files from file-set/building structure dialog box.

Note: To check the height settings of a drawing file, open the List Default Planes tool (Architecture family, General: Roofs, Planes, Sections module, Create area).



Modifying the top floor

Allplan offers a wide range of tools you can use to modify data at any time.

When modifying, you must differentiate between the following situations:

- Changes you make to element properties and their height settings using Apply Archit. Component Properties. You can apply this tool to components of the same type (only walls, for example).
- Changes you make to components of different types using
 Change Archit. Properties. You can use this tool to modify
 element properties and their height settings (e.g. height and/or
 material of walls and columns) in a single step.
- You can also modify individual elements using Properties on the shortcut menu.
- Changes you make to the geometry in the xy plane using tools on the Edit toolbar and in the Change area of the tools palette.

To modify components in the z direction, you should only use the following tools:

Change Archit. Properties

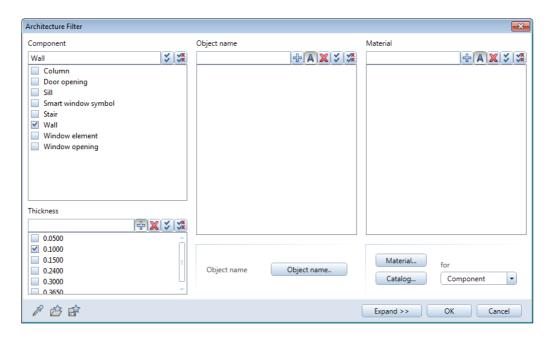
Apply Archit. Component Properties or Properties on the component's shortcut menu.

Deleting design elements selectively

You will start by deleting redundant design entities. You can use the architectural filters.

To delete design entities

- The General: Roofs, Planes, Sections module is still open. Use the Layers palette to hide layer DE_GENO2 (stair outline).
- 1 Click X Delete (Edit toolbar).
- 2 In the Filter Assistant, click 🌇 Filter by Archit. Element Type.
- 3 Only the elements that are actually available in the drawing file are presented for selection in the architecture filter.
 Select the component Wall and the thickness 0.100.
 If the required thickness is not available in the list, enter the value in the input line.

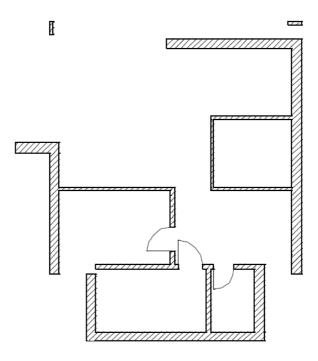


4 Enclose the entire design in a rectangular selection window. The elements selected for filtering are immediately deleted.

5 Use the Window opening filter to delete all the windows. This will also delete any window SmartParts and smart window symbols still remaining.

6 Now delete the round columns, the curved wall, the vertical section of wall at the top, the short vertical wall sections at the bottom and some of the doors.

Make the layer AR_SMSY visible. After this, your screen should look like this:



7 Press ESC to quit the X Delete tool.

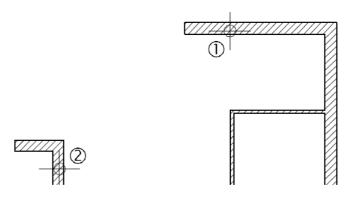
Joining walls

Walls that are not parallel can be joined using the Join Linear Components tool. You will use this tool to close the open corners.

Tip: You cannot join curved walls with other walls.

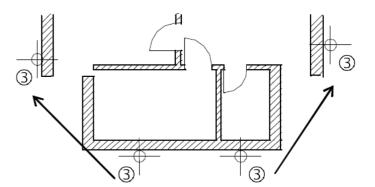
To join walls

- 1 Using the right mouse button, click the horizontal wall at the top.
 On the shortcut menu select the Join Linear Components tool.
- 2 Click the exterior wall on the left.



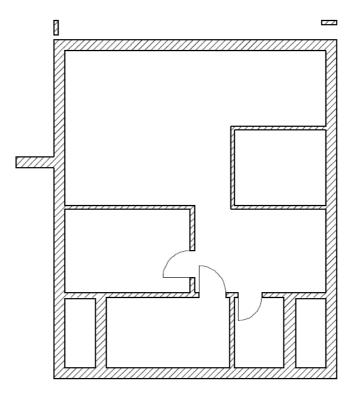
Tip: To enter the width of a joint, enter the width at the keyboard when the system prompts you.

3 Click the exterior wall at the bottom and join it with the exterior wall on the left. Then click it again and join it with the exterior wall on the right.



4 Now join the interior walls at the bottom with the exterior walls. Do not forget to join the former exterior wall at bottom left with the interior wall you have just lengthened.

Now your floor plan should look like this:



- 5 Press ESC to quit the tool or click with the right mouse button when the cursor is positioned over a toolbar.
 - Since you have made major changes to the architectural elements, minor inaccuracies might occur. It is thus a good idea to recalculate the architectural elements:
 - Click Restore 3D View (in the Change area of almost all architecture modules).
 - Click All in the input options.

Allplan recalculates the architectural elements. This can take some time.

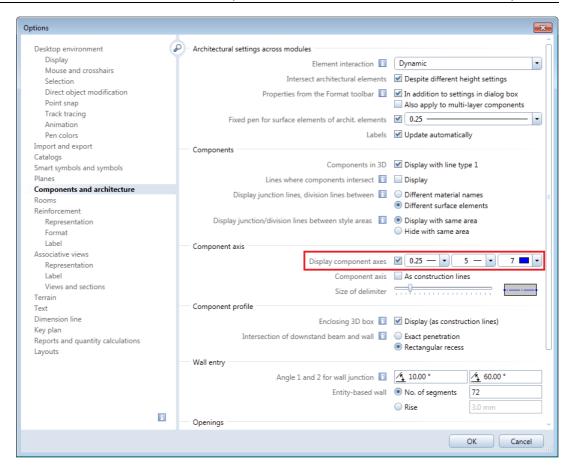
Modifying wall thickness

Some of the walls are now no longer exterior walls - they have become interior walls. To change the thickness of these walls, you will use the Apply Archit. Component Properties tool.

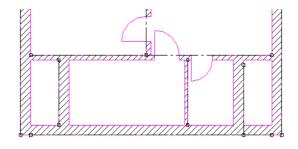
Tip: More information on the component axis is provided in Allplan's help. See the section entitled "Component Axis".

When creating these walls, you defined the offset direction inwards: the wall axis is thus on the outside. As the side where the axis is located does not change, the new thickness would also be applied toward the inside. You therefore need to move the axes of these walls to the opposite side (inside).

To see better what you are doing, you can also display the component axes in plan: open the **X** Options, Components and architecture page, Component axis area and select the Display component axes option.



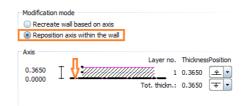
Now the walls should look like this:



To modify the thickness of walls

- 1 Click the former exterior wall on the left with the right mouse button and select **Properties** on the shortcut menu.
- 2 Select the Reposition axis within the wall option and use the mouse to drag the component axis to the opposite side of the wall in the preview area. Click OK to confirm.

The result looks like this:



- 3 Repeat steps 1 and 2 for the former exterior wall on the right.
- 4 Then click Apply Archit. Component Properties (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area).
- 5 The former exterior walls should become interior walls with a thickness of 0.175.

Click the element whose settings you want to match Click a suitable interior wall to match its parameters

The Wall dialog box opens and the parameters of the wall you clicked are displayed. Check that the thickness is set to **0.175** and the priority to **175**.

Note: Check that the Recreate wall based on axis option is active in the modification mode area.

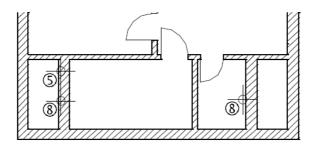
- 6 Click **OK** to confirm the dialog box.
- 7 Click New attributes on the context toolbar. This resets the attributes so that the attributes of the selected interior wall completely replace those of the exterior wall.

Tip: You can also use

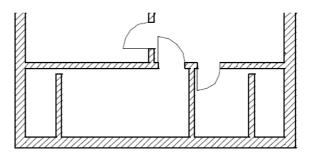
Modify Offset to change the thickness of walls.



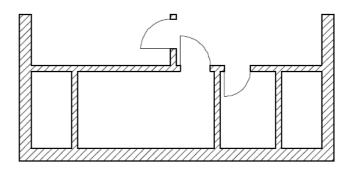
8 Click the two former vertical exterior walls at the bottom and confirm with the right mouse button.



The thickness of the walls changes. It may be necessary to join the walls with the other interior walls again.



The result should look like this:



Moving walls

To move the walls, you can use the Stretch Entities tool. Using this tool, you can move walls together with their doors and windows without changing the wall junctions.

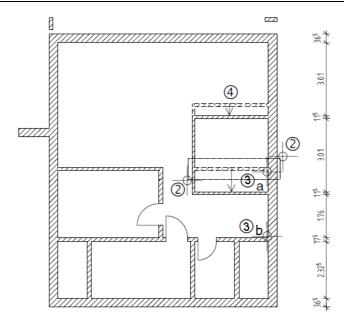
To move walls

- 1 Click **Stretch Entities** (Edit toolbar).
- 2 Select the interior wall at bottom right.
- 3 Define the new position of the wall as follows:
 - From point: click the wall corner.
 - *To point*: point to the interior wall corner at the bottom.

The data entry boxes are highlighted in yellow.

- c) Enter $\stackrel{\triangle y}{\longrightarrow}$ Y coordinate = 1.76 in the dialog line.
- d) Press ENTER to confirm.

Tip: Do not work with the crosshairs to move walls in conjunction with the Stretch Entities tool. Always enter precise values in the dialog line.



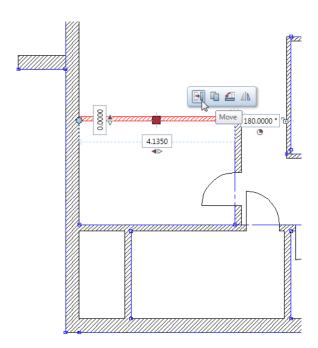
- 4 Move the interior wall at top right.
- 5 Press ESC to finish.

You can also move walls using direct object modification. However, you need to restore the wall junctions afterwards.

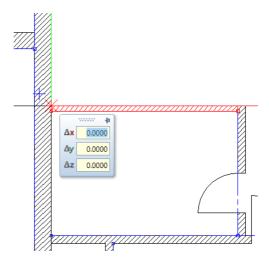
To move walls using direct object modification

- Enclose the top left interior wall in a selection rectangle.
 The wall is displayed with handles.
- 2 Point to the wall without snapping a handle.

3 On the context toolbar, click Move.



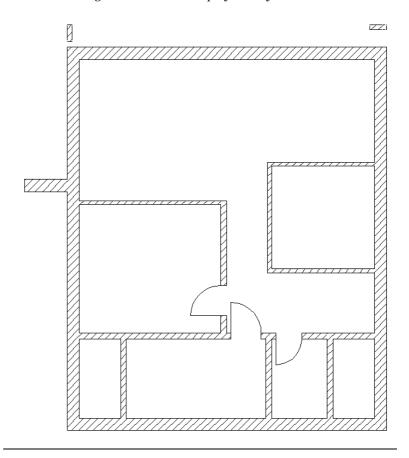
4 *<Move> From point or enter offset:*Click the point where the upper edge of the wall and the exterior wall on the left intersect.





- 6 Press ESC to quit direct object modification.
- 7 Join the two interior walls using Join Linear Components.

 The following should now be displayed on your screen:

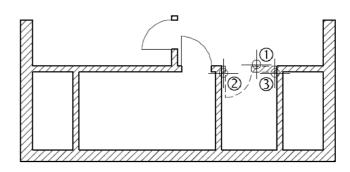


Deleting wall sections

You can use the **Delete Section of Linear Component** tool to delete entire wall sections. Two smaller, discrete walls are created based on the wall.

To delete wall sections

- Using the right mouse button, click the wall in which you want to delete a section. On the shortcut menu that appears, click
 Delete Section of Linear Component.
- 2 Click the first point on the component the corner of the wall.
- 3 Click the second point on the component (= the other corner).



Tip: If the point you click on the component is not a significant (defined) point, a small square will appear to indicate the nearest significant point together with the distance between the square and the point you clicked (represented by an arrow).

Joining walls with lines

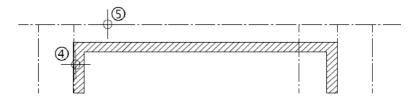
Walls can also be joined with lines in the same manner as the Join Linear Components tool. The main difference occurs when joining multi-layer walls: if only one layer in the wall is to be joined, use Join Linear Components - this tool will allow you to select the layer in question separately from the others. Using Join Linear Component with Line, however, it is only possible to select the entire wall.

The exterior wall on the left and right need to be modified so that they stretch as far the columns over which the balcony will later be constructed.

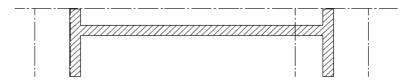
You will find it helpful now if you display the grid you drew earlier.

To join walls with lines

- 1 Open drawing file 1 **Grid** in reference mode and make the layer DE GRID visible.
- 2 X Delete (Edit toolbar) the rectangular columns.
- 3 Click Join Linear Component with Line (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area).
- 4 Click the exterior wall on the left.
- 5 Click the grid line through to which the wall is to extend.



Using the same approach, lengthen the exterior wall on the right.



7 Close drawing file 1 Grid.

Tip: You can also find the Join Linear Component with Line tool on the short-cut menu.

Changing the height settings of a wall

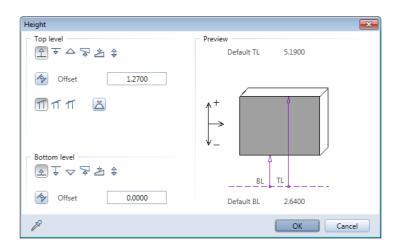
The modifications you have made so far have involved alterations in the xy plane. In the following exercise you will change the height of part of the wall on the left, at the end of the balcony. It needs to be 1.27 m high.

To change the height settings of a wall

- 1 Click 3 Viewports (Window menu) so that you can better observe the changes as they happen.
- 2 Using the right mouse button, click the section of wall on the outer left and on the shortcut menu, click Properties. The Wall dialog box is displayed and contains the parameters settings of the wall you clicked.

Click Height.... Leave the bottom level as it is. Change the settings for the wall's top level as follows:

• Top level area: A Relative to lower plane = 1.2700



3 Click **OK** to confirm the settings in the dialog boxes.

You can see how the height changes in isometric and elevation view.

Tip: You can also double click a component to view its Properties.

Modification options

You should now be aware of the main modification tools. It is up to you to decide whether it is quicker to employ one of these tools or whether it's more efficient drawing new elements from scratch. Do not forget the other, more general tools which you can use to copy, mirror and so on.

Tip:

Modify Offset,

Stretch Entities and

Fold Line are also used in 2D in the same way.

Task	Function	Functionality
Modifying parameters		
To modify parameters (such as height, thickness, dimensions and so on) of architectural components of the same type, reposition the component axis in the element. Apply Archit. Component Properties	☆	
Modifying the parameters of a single architectural element (analogous to creation) Shortcut menu - Properties	B	
Modifying architectural elements of different types (including height settings) Change Archit. Properties		
Modifying the geometry		
Changing the wall thickness Modify Offset		
Lengthening, shortening, moving walls; Changing opening sizes Stretch Entities	-\$ ^a	
Folding wall lines, fitting in wall ends Fold Line	A.	

Joining walls Join Linear Components	⊒ →	
Joining walls with lines The difference between this and joining a wall with a wall is evident in the case of walls with multiple construction layers. Join Linear Component with Line	⇒	
Deleting wall sections (the wall is divided into two sections) Delete Section of Linear Com- ponent	**	
Showing and hiding wall junctions Each wall is delimited by a boundary line even when it appears to seamlessly 'flow' into the next wall. This tool only affects the appearance of the walls and does not affect the elements themselves. Show/Hide Junctions	2	

If you have chosen to display the component axis, the

Modify Offset,

Stretch Entities and

Fold Line

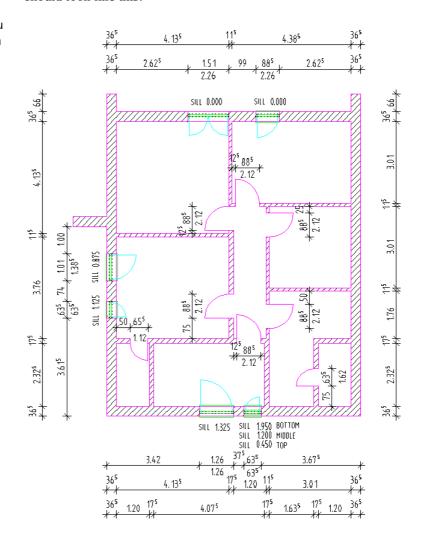
may produce different results.

More information is provided in Allplan's help. See the section entitled "Component Axis".

Final modifications

Now it's your turn. Finish modifying the top floor and add the missing doors and windows. When you have finished, the top floor should look like this:

Tip: For the balcony door, you can use the smart symbol Fen 2 flg DK in the Windows folder (Library palette - Smart symbols - Default - Smart symbol - Basic symbols).

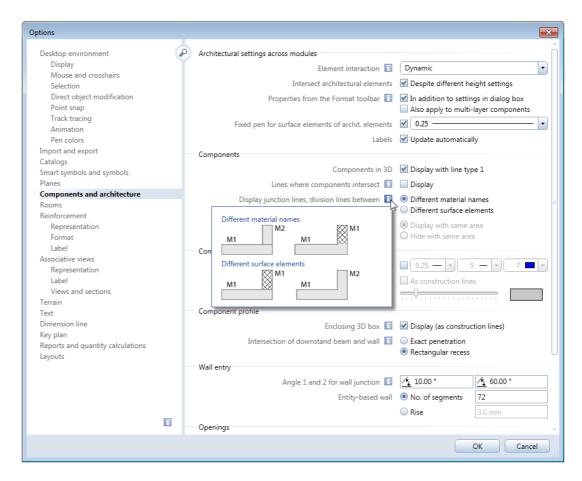


Drawing the balcony parapet

In this exercise you will be employing the following tools with which you are already familiar - Wall (straight and curved) and Delete Section of Linear Component. The parapet is 1.17 m high, the upstand is 25 cm high and 8 cm from the edge of the slab.

To draw the balcony parapet

- 1 Click Options (Default toolbar) and select the Components and architecture page.
- 2 In the Components area, select Display junction lines, division lines between: Different material names.
- 3 Click **OK** to confirm the dialog box.



4 Double-click a wall with the right mouse button.

This selects the Wall tool.

5 Modify the Properties

on the Surface elements tab:

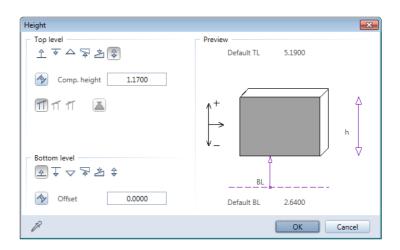
Hatching: off

on the Parameters, attributes tab:

Material: Brick
Thickness: 0.15
Priority: 150

Now click the Height... button and specify the following:

- In the Top level area, click Fixed component height and enter 1.17.
- In the Bottom level area, click A Relative to lower plane and enter an offset of 0.00.

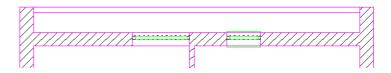


6 Draw the parapet.

Check the wall's offset direction and, if necessary, change it using Reverse offset direction.

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The Wall tool remains active!



7 Modify the Properties again:

Parameters, attributes tab:

Material: B15 Priority: 100

Height:

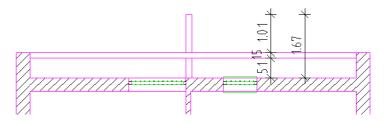
Top level:

Fixed component height: 0.25

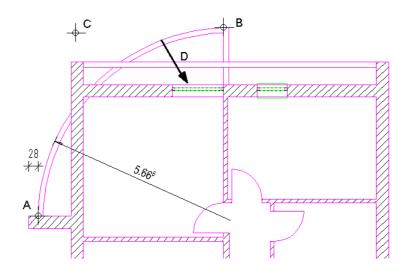
Bottom level:

Relative to lower plane: 0.00

8 Draw a straight wall. You can draw the wall in one go. Due to its lower priority rating, a 'hole' is automatically cut out of it where it intersects the parapet wall.



9 Press ESC to finish entering the straight wall. Now draw a curved wall that follows the path of the curved wall on the ground floor.



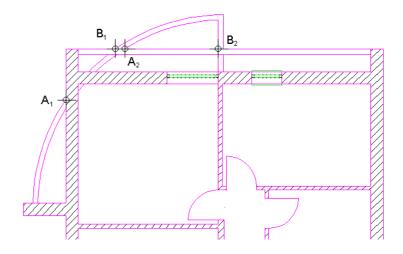
A = From point

B = To point

C = Arc's extension point

D = Wall's offset direction

10 Delete the wall sections that are not required using Delete Section of Linear Component (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area).



 $A_i = From point$

 $B_1 = To point$

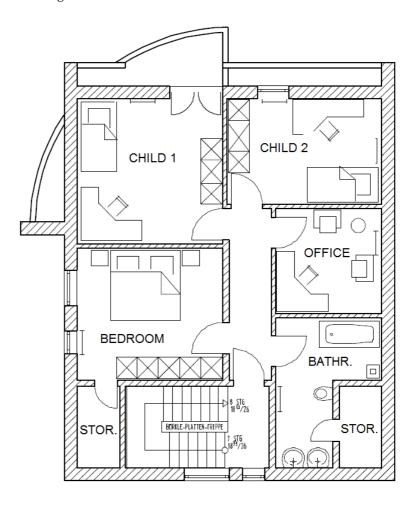
 $A_2 = From point$

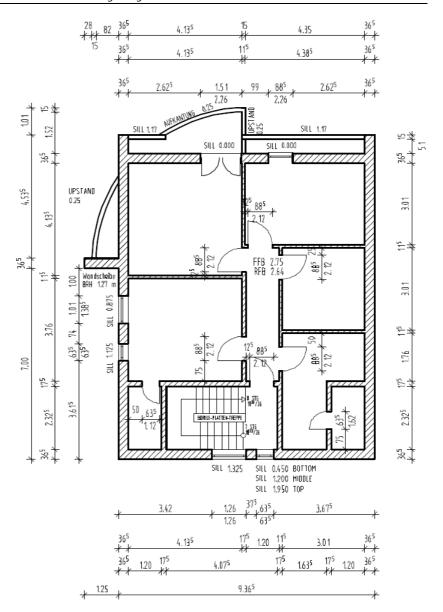
 $B_z = To point$

11 Press ESC to quit the tool.

Now you can complete the top floor yourself: add dimensions, labels and furniture. Make sure that you assign the elements to the correct layers.

When you have finished, the plan of the top floor should look something like this:





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Exercise 4: Basement

Now is a good time for you to start trying things out on your own. The best way to design the basement is to employ a mixture of the Draw the elements from scratch and Copy and modify methods you are already familiar with.

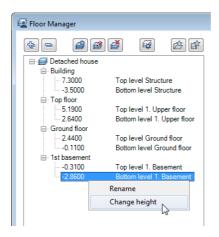
As the following steps have been covered before, the descriptions are less detailed.

Copy the components from drawing file 100 to drawing file 120

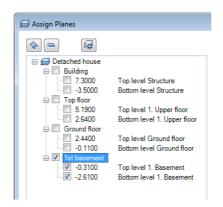
- Make drawing file 100 Ground floor model current and close all the others.
- Use Copy, Move Elements between Documents (File menu) to copy the necessary components (curved wall, columns, stair outline and some of the interior walls) from drawing file 100, Ground floor model to drawing file 120, Basement model.

Modify the elevation specifications of the basement

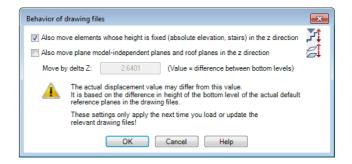
- Select Open on a Project-Specific Basis, open the Building structure tab and click Floor Manager.
- Change the bottom level of the basement to -2.61 m (corresponds to the unfinished basement floor).



- Retain the height of the planes above.
- Close the floor manager.
- Select drawing file 120 Basement model, open the shortcut menu and select Assign planes.
- basement click it.



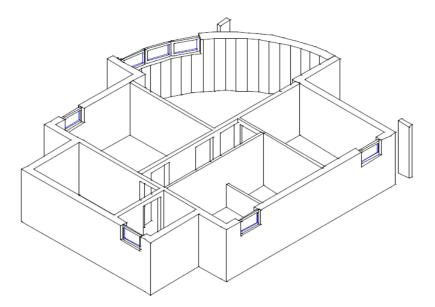
Define behavior of drawing files:

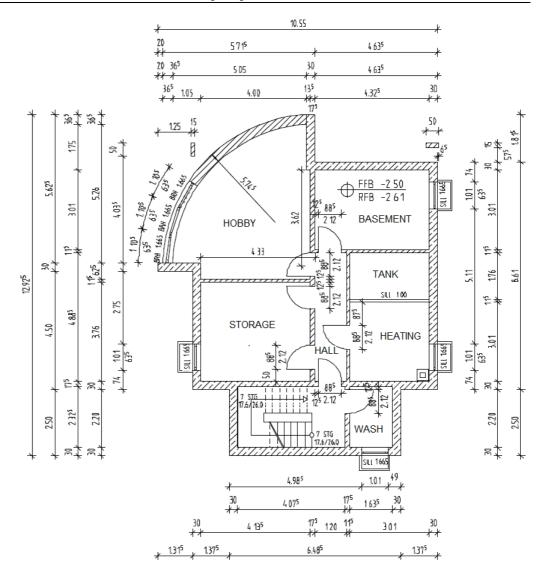


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Design the basement.

- Make drawing file 120 Basement model current and set 100 Ground floor model to reference mode.
- Here, it's quicker to create the exterior walls from scratch. Instead of making modifications, draw the exterior concrete walls along the inside edge of the ground floor walls.
- Close drawing file 100 Ground floor model.
- Now you can modify the components you copied to drawing file 120 Basement model.
- Draw the slab in drawing file 129 Basement slab (assign the planes Bottom level of ground floor and Top level of basement to this drawing file!).





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Unit 3: Reference Planes

The exercises in this unit require the
■ Special: Walls, Openings, Components and General: Roofs, Planes, Sections modules. Check in Palette to see whether you have licensed these modules.

Reference planes are applied as a means of facilitating work in 3D space without the need for tedious and time-consuming calculations. Reference planes always come in pairs - an upper and a lower plane. The general approach is as follows:

- Define the location of the pair of planes in space.
- Define the height of the architectural elements (walls, columns, windows, niches....) relative to the planes in other words, attach the top and bottom level of an element to the upper or lower reference plane at an offset of your choice.

This may appear complex at first – however, experience has shown that this is a simple, accurate and elegant approach (especially if you are designing multi-storey buildings!).

Reference planes afford great flexibility. There are two types of reference planes:

- Default reference planes horizontal and parallel to each other. They apply to the entire drawing file.
- Custom reference planes not necessarily horizontal, these only apply to the area you define by entering the outline of the planes.

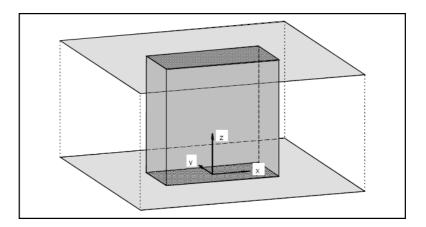
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Using Planes

Default reference planes

You have already worked with the default reference planes in this tutorial. The section that follows explains the concept of the default reference planes in more detail.

Imagine two horizontal planes in three-dimensional space, parallel to each other and at different elevations. When you position an architectural element (a wall, say) between the two planes, the program "stretches" the wall so that its top and bottom levels are flush with the upper and lower planes respectively. Every drawing file has an imaginary pair of planes (these are called the default reference planes). Default reference planes are invisible and stretch to infinity.

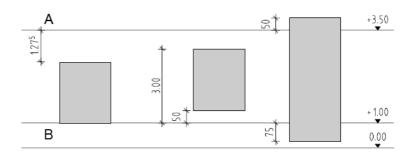


The default reference planes can be set to different heights in different drawing files. By attaching an element's top and bottom levels with these planes, you ensure that any changes you make to the height of the planes also apply to the elements. The offset distance between architectural elements and the upper and lower reference planes is user-definable.

You can enter an offset between the top level (TL) and/or bottom level (BL) of the architectural elements to the upper and/or lower reference planes. You can also specify whether the offset is a constant value.

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Example: height at top set to 3.50 and height at bottom set to 1.00.



A = Upper default plane

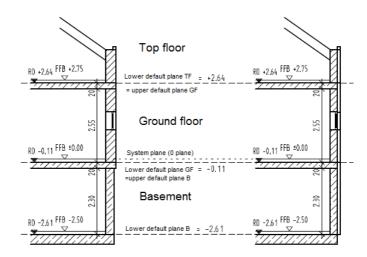
B = Lower default plane

Top level: Top level: Top level: Relative to lower Relative to upper Relative to upper plane -1.275 m plane 3.00 m plane 0.5 m Bottom level: Bottom level: Bottom level: A Relative to lower A Relative to lower A Relative to lower plane 0.00 m plane 0.5 m plane **-0.75** m

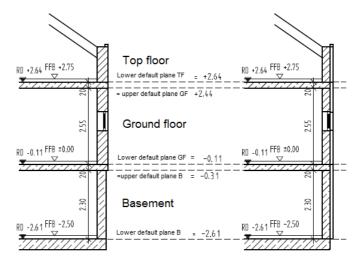
Changing the elevation of the default reference planes in a drawing file affects all the elements associated with them.

There is no rule as to how the reference planes need to be placed. However, as a rule of thumb, you might consider setting them up as follows: 208 Using Planes Allplan 2015

• Default planes at the top level of the relevant unfinished floor



• Lower default plane at the top level of the unfinished floor Upper default plane at the bottom level of the unfinished floor (used in this tutorial)



• Lower default plane at the top level of the finished floor Upper default plane at the bottom level of the suspended ceiling (e.g. for interior designers)

Custom Reference Planes

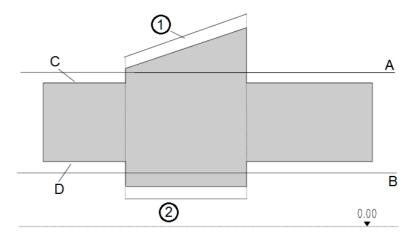
Default reference planes do not afford the possibility of accounting for height differences within a component - sloping walls, for example. In this case, custom reference planes are used.

These reference planes come in pairs, too. However, they do not stretch to infinity. They have a boundary. You can define the outline of the planes in plan - any shape you wish. These planes (there are always two) can be inclined at any angle and any height that you assign to them.

Tip: Elements can also be associated with reference planes that do not necessarily envelop the element.

You can define as many custom pairs of reference planes as you like in a drawing file and these take precedence over the default pair. All the components attached with reference planes update to meet the envelope defined by the reference planes between which they are located. If no custom reference plane has been defined, then the elements default to the default reference planes.

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C = Component top level with offset attached to the upper reference plane ① Upper custom plane

A = Upper default plane

D = Component bottom level with offset attached to the lower reference plane ② Lower custom plane

B = Lower default plane

When you design a roof frame, you are in effect creating a whole series of custom pairs of reference planes in a simple and elegant manner - we will see how this is done in the next exercise.

The Custom Planes and Modify Planes tools can be combined, providing enormous design flexibility. Presenting these tools is beyond the scope of this workbook – however, by experimenting a little, you will quickly master what these tools are capable of.

Exercise 5: Roof

Tip: See the section entitled "General: Roofs, Planes, Sections module – Basics" in the Allplan help.



The General: Roofs, Planes, Sections module contains tools that you can use to create custom planes in a comfortable manner. A roof frame is comprised of several pairs of reference planes: each slope in the roof represents one pair of reference planes. The upper plane lends a shape to the roof while the lower plane in the pair remains horizontal. This way, you can easily construct flank walls between the planes. If the walls are already plane-associated (as in this example), then they will adjust automatically to the reference planes in the roof frame.

A roof can consist of several roof frames. All you need to do is draw the outlines of the additional roof frames in plan. They can cover an existing roof in its entirety or parts thereof. Allplan will automatically calculate and intersect the roof planes.

Procedure to follow when designing a roof

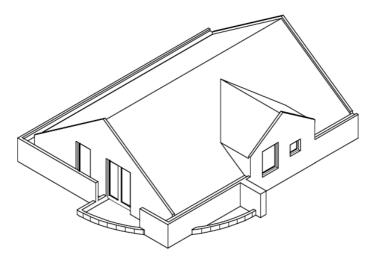
- 1 Enter the roof outline and the top and bottom level of the roof. Allplan will initially create a cube-like frame.
- 2 Apply slopes to the frame and make settings for the height. Height setup:
 - Enter the absolute height of the eaves or
 - Set a point through which the slope is to pass.

This will form the roof shape.

3 Use the Roof Covering or Slab tool to apply a roof covering.

Roof frame

In the sample building here, you need to add a roof with a dormer. The main roof and the dormer pitch is 35°. The flank of the roof joins with the flank walls at the sides of the building. The roof slopes extend to the inside edge of the exterior walls, to create a hidden eaves gutter. The position of the roof slopes will be defined by the height for the line of the eaves.



Isometric view of the top floor with the roof

To create the main roof

- **○** Make drawing file 112 Roof current and set 110 Top floor model and 3 Chimney to edit mode.
- Make only the layers AR_WALL, AR_ROOF and AR_CHIMN visible.
- ⇒ In the Tools palette, select the General: Roofs, Planes, Sections module.
- 1 Click Roof Frame (Create area) and activate the layer AR ROOF.
- 2 Click A Gable/hip roof.

3 Click Angle and enter 35.

The bottom of the roof frame is to be flush with the lower default reference plane of the top floor.

- 4 Click Bottom level and enter: 2.64.
- 5 Click **Top level** and enter **10**, as the top level of the roof frame needs to be above the future ridge.
- 6 Click Eaves and enter the height of the eaves: 3.44.

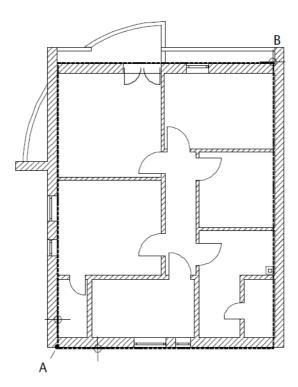


Tip: When you enter the outline of a roof, you can define an offset as you would when enclosing entities in a parallel offset polyline. The polyline entry tools are also available here.

Now enter the rectangular outline of the roof (lines representing the eaves):

7 Click with the right mouse button in the empty workspace (do not click an element!), select Point of Intersection on the short-cut menu and click the first corner.

8 Click the diagonal point and then press ESC. This defines a rectangle.



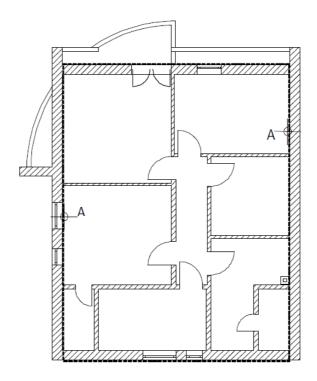
A = 1st point = point of intersection

B = Diagonally opposite point

9 Click 3 Viewports.
The roof frame is still a simple cube.

10 In plan view, click the edges of the roof to indicate where the slopes are to be applied.

Observe the changes as they happen in the isometric view.



A = Click edges of roof frame to apply slopes

11 To finish defining the roof, press ESC or click with the right mouse button when the cursor is positioned over a toolbar.

You can now create the dormer using two more pairs of custom reference planes. To define the position of the slopes, you will use the height of the eaves. The dormer's eaves are 4.48 m high and consequently higher than the eaves of the main roof.

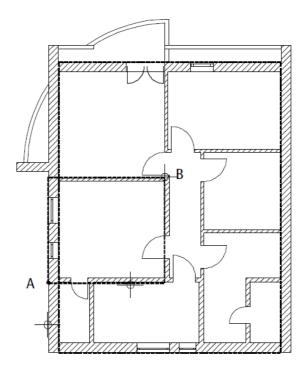
To create a dormer

- 1 Click **Operate** Dormer (Create area).
- 2 Click an edge of the main roof.

3 Check the roof parameters and modify the Eaves: 4.48



Define the outline of the dormer in plan by clicking diagonally opposite points. Use Point of Intersection (Point Assistant on the shortcut menu) to help you. The outline must define the start point and the width of the dormer exactly. The length towards the middle of the building should be sufficient for the intersection of the roof planes.



A = 1st diagonal point (point of intersection)

B = 2nd diagonal point

Tip: As an alternative to pressing ESC, you can also quit by clicking the right mouse button when the cursor is positioned over a toolbar.

- 5 Press ESC to finish. Now you have defined the outline of the dormer.
- 6 Click the dormer on both sides. This will form the slopes.
- 7 Press ESC to quit the tool.

Modifying the roof frame

Roof planes can easily be modified. The relevant parameters are located on the context toolbar.

In this exercise we will draw a 1 m elevation line. This will be a useful aid later on.

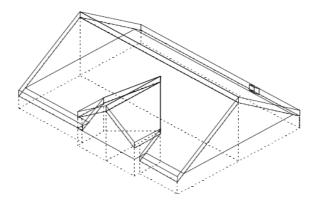
To draw an elevation line

- **⇒** The General: Roofs, Planes, Sections module is still open.
- 1 Click Modify Roof Frame (Change area).
- 2 Click the ridge of the roof.
- 3 To specify the absolute height of Elevation line 1, enter 3.75 (1 m above finished floor on the top floor).

 The elevation line is drawn in and displayed as a construction line.
- 4 Press ESC to guit the tool.

Roof covering

To apply the roof covering, use the **Roof Covering** tool. The bottom level of the roof covering will be set so that it is flush with the upper roof plane. The offset distance between the planes and the top of the roof covering will determine the thickness of the roof covering.



To create a roof covering

- **○** Make drawing file 3 Chimney current and set 110 Top floor model to reference mode.
- 1 Activate the layer AR_ROOFC and click Roof Covering (Create area).
- 2 Click Properties.
- 3 The roof covering is to consist of a single layer and it is to cover all roof and dormer planes. Click the corresponding icons.
 - Roof covering consisting of a single layer
 - Z Roof covering above all roof and dormer planes
- 4 Height of bottom level above roof plane: 0.0
- 5 The polygon you enter for the roof covering in plan is to apply to the top level of the roof covering. Select the corresponding option.

6 Open the Parameters, attributes tab and enter the following:

• Thickness: 0.2

• Material/qualities: B25

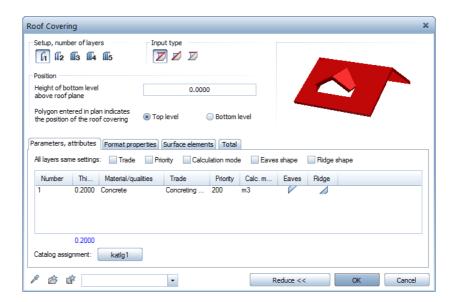
• Trade: Concreting work

• Priority: 200

• Calculation mode: m³

• Eaves:

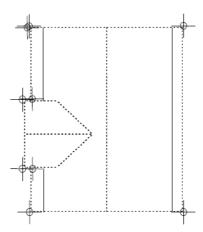
• Ridge:



- 7 Click **OK** to confirm the dialog box.
- 8 Click Multi in the input options.



9 Now click the corners of the roof outline (the last point you click should coincide with the first).



10 Click Minus in the input options.



- 11 Draw a "minus" roof covering i.e. cut out a section for the chimney.
- 12 Press ESC to quit the tool.
- 13 Close drawing files 3 Chimney and 110 Top floor model again.

You can use Multi in the input options to specify whether the area you enter is to be added (Plus) or subtracted (Minus).



By placing a check mark in the box, you can specify how the polyline entry tools behave when you generate polylines based on existing elements and how architectural lines are to be handled.

Slab or Roof Covering?

In theory, both of these tools can be used to create a roof covering. The difference is:

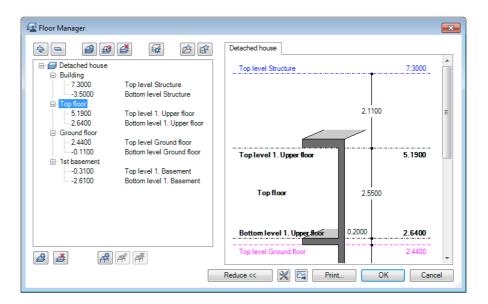
- When a Roof Covering protrudes beyond the area of the roof planes, it retains its slope setting.
- The areas of a Slab that protrude beyond the roof planes automatically adapt to the default reference planes.
- The Roof Covering tool enables you to enter different shapes for eaves and ridge.
- With Roof covering tool, you ensure that the representation will be accurate when the masking plane tool is employed.
- With the Slab tool, the masking plane has the same effect as when it is applied to walls and columns.
- Openings in the Roof Covering are created using the
 Skylight tool. You can also insert smart window symbols in these openings.
- When you use the Slab tool, openings are
 created using the Recess, Opening in Slab/Plate tool. Smart
 symbols inserted in these openings do not adjust to custom planes or roof frames.

Joining walls with the roof

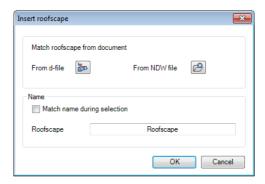
Now you will use the floor manager again to join the flank walls and interior walls with the roof. Drawing file 112 Roof contains the roof planes and the roof covering. This forms the roofscape, which you will integrate in the floor manager. After this, you can will assign the custom roof planes to all plane-associated components in drawing file 110 Top floor model. Custom reference planes (and consequently roof planes, too) have precedence over default reference planes. This means that plane-associated building elements in the drawing file will adapt to reflect the new constraints imposed by the revised envelope (defined by the custom reference planes).

To integrate a roofscape

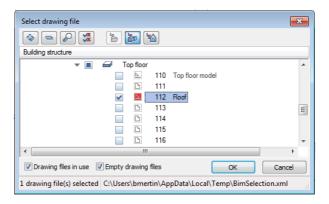
- 1 Select Open on a Project-Specific Basis.
 The Building structure tab is open.
- 2 Click Floor Manager.
- 3 Select the **Top floor** structural level. This is the level into which you want to integrate the roofscape.
- 4 Click Insert roofscape in the lower part of the Floor Manager dialog box.



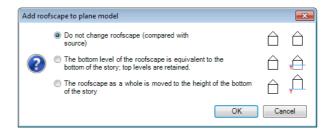
5 The Insert roofscape dialog box opens. Activate From d-file in the Match roofscape from document area.



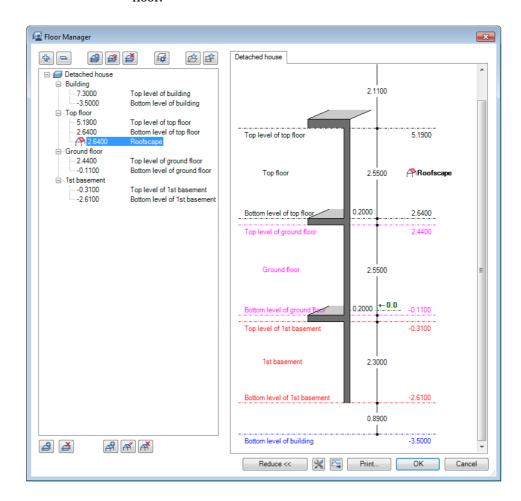
6 Select drawing file 112 Roof (place a check mark!).



- 7 Click **OK** to confirm both dialog boxes.
- 8 Do not change the roofscape planes with regard to the planes from the source drawing file 112 Roof.Select the relevant option and click OK to confirm.

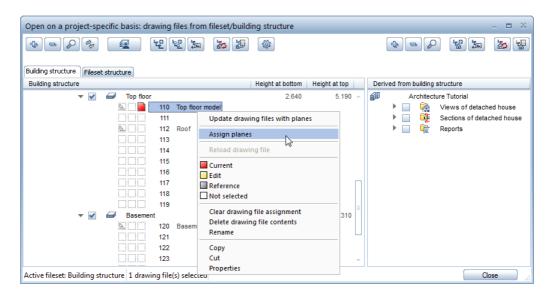


The Roofscape was integrated into the floor manager under Top floor.

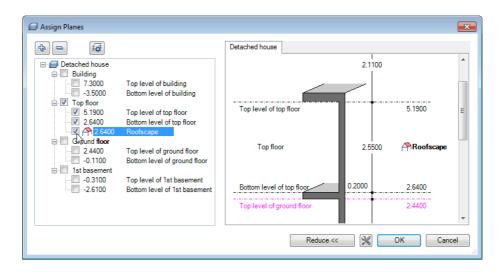


9 Click OK to close the Floor Manager.

10 Open the shortcut menu of drawing file 110 Top floor model and select Assign planes.



11 Select the Roofscape check box in the Assign planes dialog box and click OK to close.



12 Click **OK** to confirm the **Behavior of drawing files** dialog box without selecting an option.

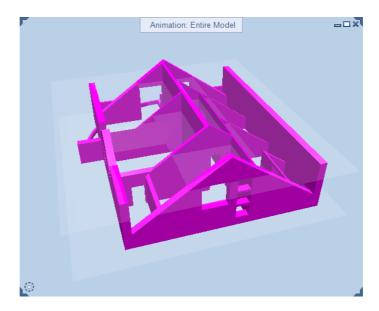
You can see in the Open on a project-specific basis: drawing files from fileset/building structure dialog box that planes of a roofscape were assigned to drawing file 110 Top floor model.



13 Make drawing file 110 Top floor model current and close all the others.

You set the view to 3 Viewports at the beginning of this exercise. If you look at the isometric view, you can see that the flank walls and interior walls of the top floor have adapted to the roof planes.

In order to display the design in animation, click View Type on the viewport toolbar and select Animation or press F4.



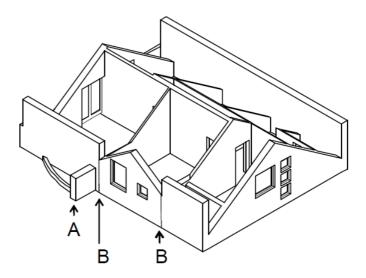
The exterior walls on the side are not beneath the roof planes. Consequently, they have not adapted.

Joining walls with the roof

Please note the following: the interior and exterior walls on the top floor are joined with the roof planes.

The side wall on the right is not enveloped by the roof frame and thus orients itself to the default upper reference plane.

The left side wall is enveloped by both the planes in the dormer and the default reference plane. You need to divide this wall segment into three wall sections so that you can handle each section separately.

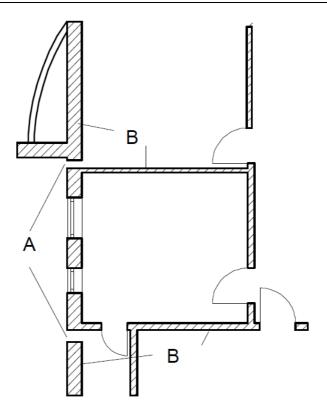


A = Do not join wall segment

B = Divide wall here

To join walls with the roof

- **⇒** Only drawing file 110 Top floor model is open.
- 1 Click Delete Section of Linear Component (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area) and delete a section of the wall, starting at the division point.



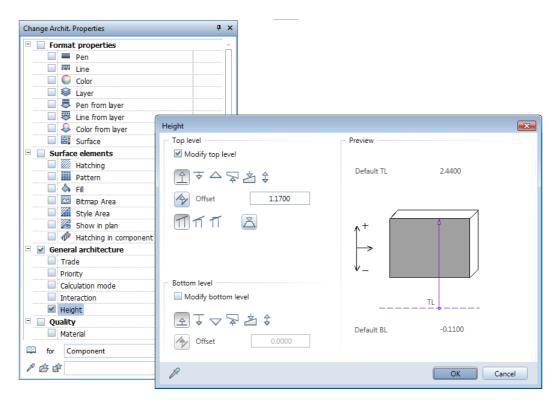
B = Join wall with line

- 2 Click Join Linear Component with Line (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area) and join the wall sections again. There are three wall sections, even if the edges are no longer visible.
- 3 Click Change Archit. Properties (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area) and change the height for the top level of the side walls that are not below the roof frame.
- 4 Select the check box beside Height.

A = Delete wall sections

Tip: Selection preview - point to the wall without clicking: the relevant wall section is displayed in the selection color.





Tip: If the walls do not assume the full new height, you need to clean up the wall junction between adjacent exterior walls using Join Linear Components.

Check the wall junction lines: Open the Options,
Components and architecture page, Components area and select the Display lines where components intersect option.

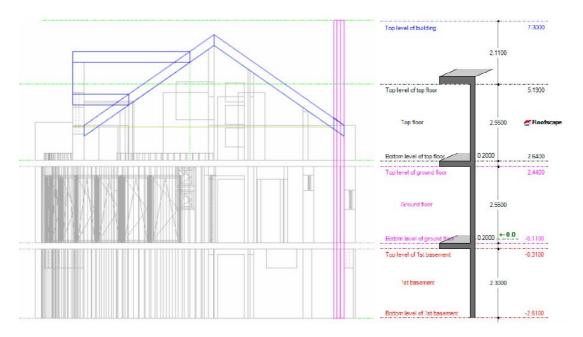
5 In the Height dialog box, select Modify top level and \(\begin{align*}
\text{ \text{T}} \\ \text{Relative to lower plane, enter an offset of 1.17 and click OK to confirm.}
\end{align*}

Leave the bottom level as it is.

- 6 Click the exterior walls to be modified. They are displayed in the selection color.
- 7 When you have selected all components, click Apply in the Change Archit. Properties dialog box.

Modifying the height of the chimney

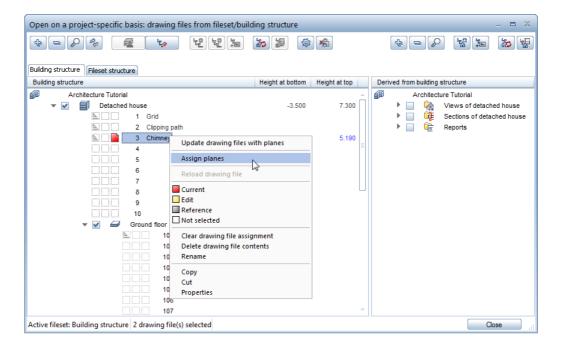
The bottom level of the chimney is attached to the bottom level of the basement and the top level to the top level of the building. When creating the plane model, you assumed a building height of 7.30 m.



Now you will modify the top level of the chimney so that it is attached to the height of the top level of the top floor.

To modify the height of the chimney

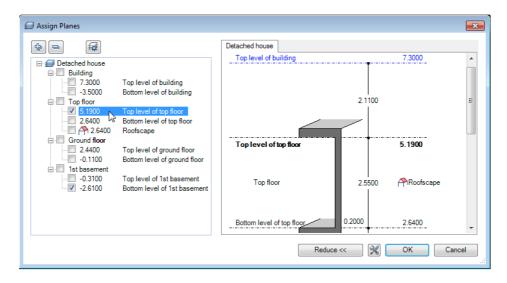
- 1 Click Open on Project-Specific Basis (Default toolbar or File menu).
- 2 Make drawing file 3 Chimney current and close all the others.
- 3 You assigned the following height settings to drawing file 3 Chimney: Height at top is set to Top level of building (7.30 m) and Height at bottom is set to Bottom level of basement (-2.61 m).



To attach the Height at top to the top level of the top floor, open the shortcut menu of drawing file 3 Chimney and select Assign planes.

The Assign planes dialog box opens.

4 Select Top level of top floor (5.19 m).



- 5 Click **OK** to close the dialog box.
- 6 Click **OK** to confirm the **Behavior of drawing files** dialog box without selecting an option.

7 The selected heights are assigned to drawing file 3 Chimney.

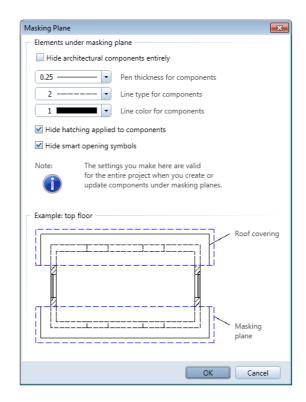


Using a masking plane for the top floor

You can use the masking plane to change how architectural elements are displayed in specific areas or to hide them entirely.

To enter masking planes

- → Make drawing file 115 current.
 Open drawing file 110 Top floor model in edit mode.
 Open drawing file 112 Roof in reference mode.
- 1 Click Masking Plane (Tools palette, Architecture family, General: Roofs, Planes, Sections module, Create area) and specify how the components below the masking plane are to be displayed: pen 1 0.25 and line 2. Hide component hatching and smart symbols.



2 Click **OK** to confirm.

3 Activate the layer AR_MASKP.

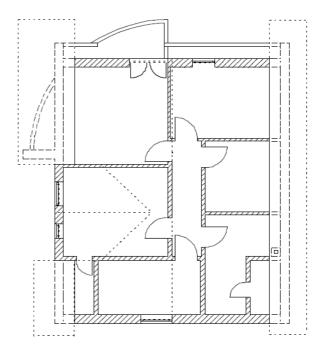
Change how the component is displayed below the 1-m line.

Note: Use the Input Options:

To create several regions at once, click Multi and then Plus.

4 Draw the plane areas as rectangles based on two diagonally opposite points.

The 1 m line serves as the boundary inside the building. On the outside, the region will stretch somewhat beyond the walls.



- 5 Quit the tool and open drawing file 112 Roof in edit mode.
- 6 Click Restore 3D View (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area) and click twice in the workspace with the right mouse button (do not double-click!).

The components are recalculated taking the masking plane into account. This does not change the way the roof covering is displayed.

7 Close drawing files 112 Roof and 115 and make drawing file 110 Top floor model current. Use Restore 3D View again (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area). The elements are displayed again without the masking plane.

Please note that when using the Restore 3D View tool to recalculate the display, the masking plane applies to the current drawing file and all those open in edit mode.

The masking plane applies even if the layer on which it resides is hidden.

Drawing the upstand

The roof will now be given an upstand that is 11.5 cm wide and 10 cm high. You will draw this upstand in a separate drawing file. First, however, you need to assign the roofscape to this file.

You should always make a point of giving your drawing files meaningful names!

To draw the upstand

- 1 Select Den on a Project-Specific Basis.
- 2 Open the shortcut menu of drawing file 116, click Assign planes and select the height settings of the story and the roofscape. Click OK to confirm the Behavior of drawing files dialog box without activating an option as the drawing file is still empty.
- 3 The Open on a Project-Specific Basis dialog box is still open. Make drawing file 116 current and set drawing file 110 Top floor model to edit mode.
- 4 Use List Default Planes to check the height settings of the new drawing file 116: Default lower plane = 2.64 m and Default upper plane = 5.19 m.
- 5 Click Wall (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area) or double-click an existing wall with right mouse button.

Tip: You can also draw upstands using the Upstand tool (Tools palette, Architecture family, Special: Walls, Openings, Components module, Create area). The top level of the wall below serves as the height of the upstand. But as this tool is not suitable for creating upstands on flank walls in this example, you will use the Wall tool instead.

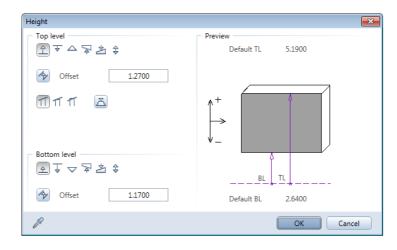
6 Set the Properties:

Thickness: 0.115 Material: B25

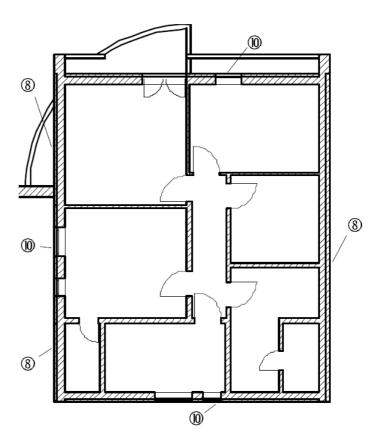
Height: associate the top level and bottom level with the lower

plane and enter the following values for the offset.

Then click **OK** to confirm.

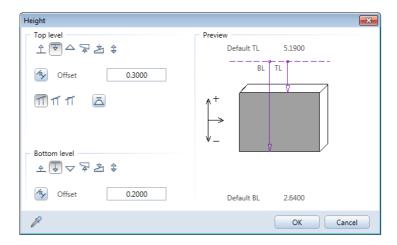


7 Draw the upstand on the flank walls but not over the dormer.



8 Now change the Height for the end walls in the main roof and the dormer. The upstand should be flush with the roof covering.

Note: To ensure that the distance between the upstand and the roof plane stays at 10 cm, set both toggles to Offset perpendicular to plane.



9 Draw the upstand on the end walls and above the dormer.

Designing alternatives

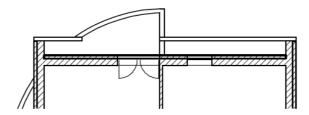
With just a few clicks of the mouse, you can design alternative facades for the balcony.

To design an alternative

- **○** Open drawing files 110 **Top floor model** and 116. Copy them to an empty drawing file 117, for example.
- **⇒** Assign the roofscape to drawing file 117.
- **○** Make drawing file 117 current and close all the others.

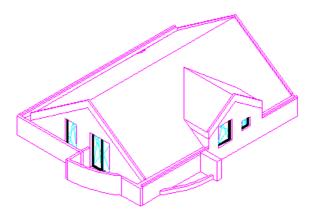
Tip: Instead of having the parapet pass through the exterior wall, first use Join Linear Component with Line to reset the exterior wall and lengthen the parapet.

1 Use Join Linear Component with Line to alter the wall junctions as shown below.



2 Use Change Archit. Properties to change the height of the parapet to 1.27 m.

Set the view type to Hidden line image; the resulting image of the new drawing file along with drawing file 112 Roof should look like this:



Exercise 6: Custom Reference Planes

Next you will draw the roofs for the carports using custom reference planes. The pitch of the roofs is 8°. You will place these custom planes over the outlines of the carport roofs.

So that you can better compare the alternatives, first copy the drawing file 101 Ground floor, carport to an empty drawing file. You will learn how to copy using ProjectPilot.

Copying and moving drawing files

Copy, Move Elements between Documents...

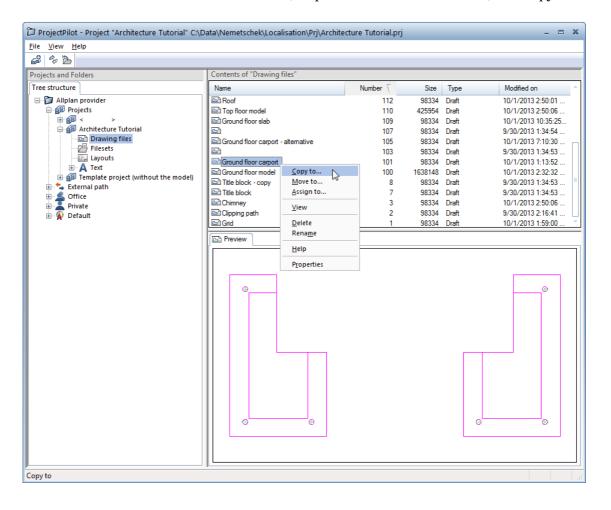
ProjectPilot -> drawing files

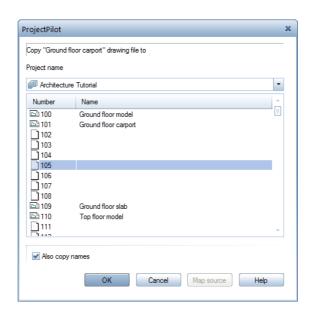
- Within the project only
- Individual elements and elements in drawing files open in reference mode can be copied/moved
- Destination drawing file can already contain elements.
 New ones are added
- Elements can be positioned as required

- Within the project and in other projects
- Entire contents of drawing files are copied/moved
- Any number of drawing files can be copied/moved in one go
- The contents of drawing files are overwritten (after additional confirmation)

To copy drawing files using ProjectPilot

- 1 Click ProjectPilot on the File menu.
- 2 Open the folder with the tutorial project, select drawing file 101 Ground floor, carport and on the shortcut menu, click Copy to....





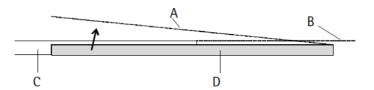
3 Select the destination drawing file 105 and click OK to confirm.

- 4 Rename drawing file 105: "Ground floor carport alternative".
- 5 Exit ProjectPilot.

Defining custom reference planes

The custom reference planes will be created on the drawing file with the carport you just copied. Each carport roof will have its own pair of reference planes. The lower reference plane in each pair will remain horizontal while the upper reference plane will be defined by placing two points and specifying an angle of inclination.

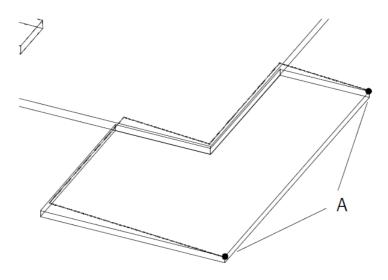
Tip: A plane can be defined with three points or with two points and a slope.



Detail, cross-section

A = Upper custom plane; B = Upper default plane;

C = Ground floor slab; D = Carport roof



Isometric view, the carport roof slopes along the outside edge A = Plane points

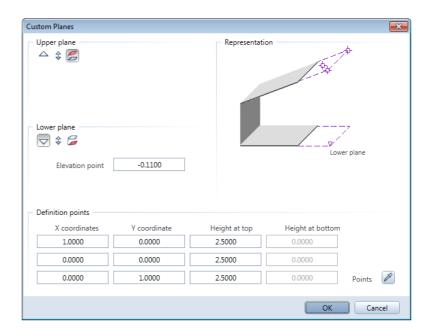
To define custom reference planes

- **⊃** In the Tools palette, select the General: Roofs, Planes, Sections module.
- Select the copied carport drawing file 105 Ground floor, carport

 alternative and open drawing file 109 Ground floor, slab in reference mode.
- 1 Make layer AR_SLAB visible and hide all the others.
- 2 Click **Custom Planes** (Create area).
- 3 Click Properties.

The upper plane needs to be inclined while the lower one stays horizontal, flush with the lower default plane.

- 4 In the Upper plane area, click **S** Custom plane.
- 5 In the Lower plane area, click **▼** Elevation and enter -0.11.



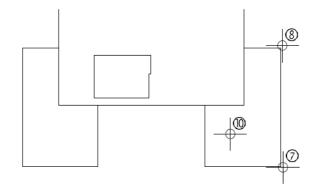
Start by defining the inclination of the upper plane. If you know the position of three points defining a plane, you can enter their coordinates in the appropriate boxes.

In this example, you will get the position of the first two points from the drawing and then specify an angle of inclination.

- 6 Click the button beside Points.
- 7 *Point 1* Click the corner at bottom right and specify its height: **2.59**.
- 8 *Point 2* Click the corner at top right and specify its height: **2.59**.

Tip: You can also click the first points in an isometric view.

This way, you define three coordinates per point with a single click!



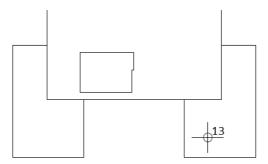
- 9 *Point 3 / inclination of upper plane* Enter the inclination: 8.
- 10 *Area of upward inclination* Click in the workspace to the left of the two points.
- 11 Now you have defined the inclination of the upper plane. The Custom Planes dialog box is displayed again. Click **OK** to confirm.

Now enter the outline of the custom plane.

12 Select Area detection in the Input Options.



13 Click inside the outline of the carport and press ESC.



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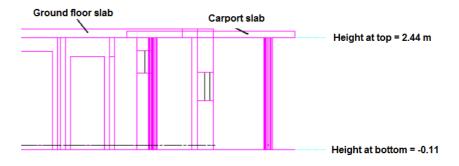
Tip: If you select the **Multi** option in the input options to begin with, the tool stays open.

14 Click 3 Viewports. You should now see the sloping reference planes in the isometric and elevation views.

- 15 Repeat steps 2 through 12 to create the second pair of custom reference planes for the second carport roof.
- 16 Press ESC to quit the tool.

Further edits

The carport roofs must be attached to the custom planes. When you created the roofs (see "Carport roofs" on page 162), you "placed" them on the upper plane of the ground floor (see following illustration).



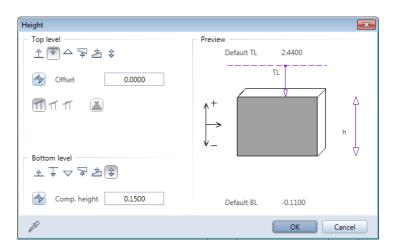
- A = Ground floor slab
- B = Carport slab
- C = Height at top (2.44 m)
- D = Height at bottom (-0.11 m)

To attach the carport roofs to the custom planes

1 Open the shortcut menu of the right-hand carport and click **Properties**.

The Slab dialog box opens.

2 Change the height settings:
In the Top level area, set Relative to upper plane to 0.
Leave the Fixed component height as it is: set to 0.15 m.

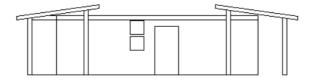


3 Click **OK** to close the dialog box.

Now you have attached the roof covering to the custom plane.

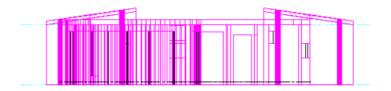
- 4 Repeat these steps for the left carport.
- 5 Make layer AR_COL with the columns modifiable and open drawing file 100 Ground floor model in reference mode.

Set the view type to Hidden line image; the Front, South Elevation should now look like this:



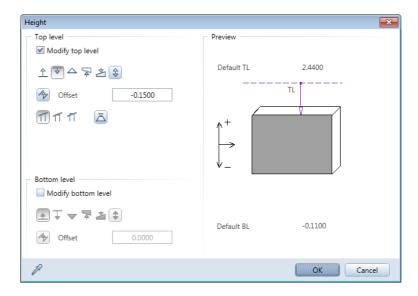
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Create a wireframe model of the Front, South Elevation. You can see that the columns do not end beneath the carports but extend up into them. This is a result of the relative height you set when you created the columns (see "Columns" on page 84).



To adapt the columns

- 1 Select Change Archit. Properties.
- 2 Click Height.
- 3 Select the Modify top level check box. In the Top level area, set Relative to upper plane to -0.15. This changes the offset of the column's top level to the upper plane.



4 Apply the new height setting to the columns: select the **Column** architecture filter and enclose the six carport columns in a selection rectangle.

The columns end beneath the carport roofs:

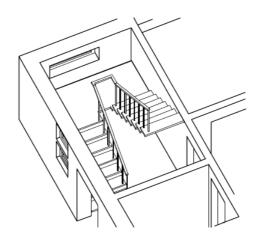


Unit 4: Stair

The exercises in this unit require the Stairs module. Check the Palettes to see whether you have licensed this module.

You still need to design the stairs between the ground floor and the top floor. With Allplan's Stairs module, you can design both standard stairs and freeform stairs in three-dimensional space. The stair outline, steps, stringers, handrails etc. are freely definable.

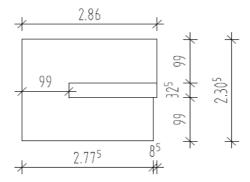
In this tutorial, we can only cover one of the wide range of possibilities. If you want to use the Stairs module effectively, spend some time experimenting with other stair shapes and try out different parameter settings. Each exercise begins with remarks that are also valid for the other stair shapes.



Before you start designing the stair, draw the outline using construction lines. This will be a useful aid to orientation when you enter the staircase.

To draw the stair outline in construction line mode

- Open drawing file 100 Ground floor, model and close the others. Make the layer DE_GEN02 (stair outline) visible and hide all the other layers.
- 1 Click Line (Tools palette, Basic family, Draft module, Create area), switch Construction line mode on (Format toolbar) and make the layer DE_CLINE current.
- 2 Trace the outline of the stair.



- 3 Switch Construction line mode off again.
- 4 Keep the layer DE_CLINE visible and hide all the other layers.

The procedure for creating a stair is always the same. Once you have created a stair, it can always be altered using Modify Stair.

Procedure to follow when creating stairs

- Select the stair type.
- Enter the outline of the stair. This also defines the flight length from the bottom of the stair.
- Set up the height and position the line of travel. The system will initially create a basic stair design that can be modified to your specific needs.
- If necessary, change settings e.g., number of steps, position of last step, step angle etc.

 This completes the initial design. Only the treads are displayed.
- Set up stair components (optional) such as handrails and carriages.
- Lock the stair and label it.

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Exercise 7: U-Type Stair

Tip: See the section entitled "Stairs module – Basics" in the Allplan help:



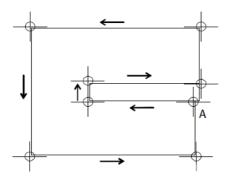
Start by creating the basis for the stair.

The stair outline you enter depends on the stair type you select. For example, if you select the straight stair type, the system will close the outline after you have placed four points. The outline of a u-type stair is defined by 8 points. A spiral stair is defined by two arc radii and a free-form stair can be based on as many points and shapes as you want - even splines.

To create the basic stair

- 1 Click U-Type Stair (Tools palette, Architecture family, Stairs module, Create area) and activate the layer AR_STAIR
- 2 The first point you click will define the point where the bottom of the stair and the inner stringer meet. In all stairs this is one of the points at the bottom (inner or outer stringer).

Click the other corners using the outline of the stair we created earlier. In total, you need to place 8 points.

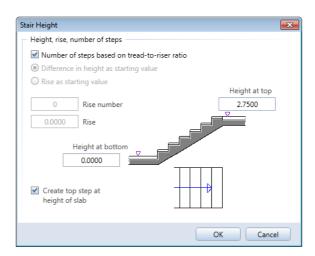


A = First point, inner stringer (from bottom)

- 3 Click the Height box.
- 4 Select the Number of steps based on tread-to-riser ratio check box and enter the following height settings:

- Height at top: 2.75 (top floor default lower plane + 11 cm; finished floor on top floor)
- Height at bottom: 0.00 (ground floor default lower plane
 +11 cm; finished floor on ground floor)

Then click OK to confirm.



You can see the height of the stair – 2.75 m – in the Stair Outline / Line of Travel / Height dialog box.

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

A stair is created and the dialog box with the parameters for the stair geometry is displayed.

- 6 Press ESC to finish entering the stair parameters.
 Click Yes when you see the confirmation prompt and place the label.
 If you do not want to label the stair, just press ESC.
- 7 Open drawing file 109 Ground floor, slab in reference mode.
- 8 Make layers AR_WALL and AR_SLAB visible too.
- 9 Click 3 Viewports.
 In the isometric and elevation views, check the height and orientation of the stair.

Modifying the stair geometry

You can modify the parameters proposed in the **Stair - Outline** dialog box. In this exercise you will:

- Position the last step.
- Change the step angle (only possible with u-type stairs).

The tread and rise are calculated automatically by the system. In the case of u-type stairs, the landing cannot be modified; its position is locked by the stair outline. The number of steps, however, can be altered - this is true for all the stair types.

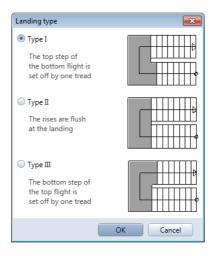
Stair symbols

Large arrows on the steps indicate that the components are at different heights.

Small arrows on a short line indicate that two components (steps or landings) are at the same height.

To modify the stair geometry

- 1 Click Modify Stair (Tools palette, Architecture family, Stairs module, Change area) and click the stair's line of travel.
- 2 Click Landing Type, activate Type I and click OK to confirm.



3 Click Top Step. The display will change to TH-. In elevation, you can see how the last step is one rise below the top of the stair. The top flight thus has 7 steps and 8 rises. The value of the rise changes automatically and the tread is calculated based on the length of the first flight.

In plan, you can see how the top flight doesn't quite reach the border of the stair outline. The flight needs to be moved along the line of travel.

- 4 First, check the distance between the last rise and the boundary of the outline using Measure distance (Default toolbar).
- 5 Click Offset at top (defining the overlap above) and enter the value for the distance (calculated above): 0.085.

 You will lengthen the landing by the same value and the steps will move.

The Stair Geometry dialog box should now look like this:



Defining stair components

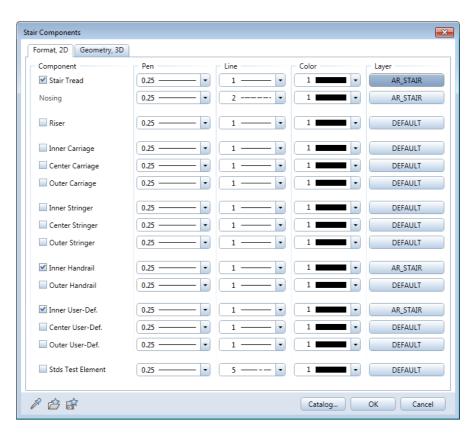
On the screen, the stair is represented by treads only. If you want, you can add other stair components. The program presents these components and offers options for displaying them in a single, easy-to-use dialog box. In addition, each component also has its own property sheet where you can set up the various dimensions. In the following exercise you will learn how to define the treads, the inner handrail and the balusters.

To define stair components

- The Stair Geometry dialog box is open.
- 1 Click to access the **Stair Components** dialog box.
- 2 In the Stair Components dialog box, select the Format, 2D tab.

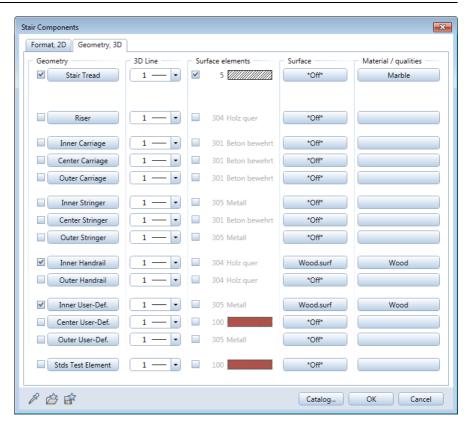
Tip: User-definable components can be used for balusters, panel walls, flanges and other stair elements.

3 Enable the components Stair Tread, Inner Handrail and Inner User-Def (here baluster).
 Click the button in the Layer area and assign the AR_STAIR layer to the components you have just selected.



In the Format, 2D tab you can also modify the format properties used to display the selected components in plan view.

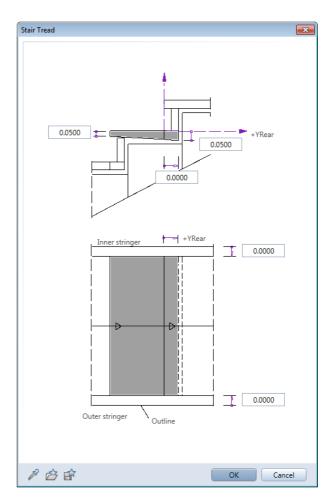
4 Now switch to the Geometry, 3D tab.



You can use the **Geometry**, **3D** tab to enter not only the geometry of the stair components but also to set a wide range of parameters:

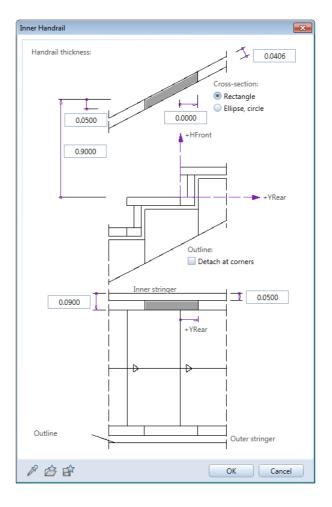
- In the 3D Line area, you define the line types that are used to display the components in 3D views.
- In the Surface elements area, you define the hatching style, pattern, fill or style area that is used to display the components in architectural sections.
- In the **Surface** area, you can assign custom surfaces to the components.
- In the Material area, you can assign materials to the components. These materials can be analyzed and evaluated in specific stair reports.

5 In the Geometry, 3D tab, click Stair Tread and enter the Thickness of the tread at the front and rear as well as the Distance between the tread and the outline of the stair. Click OK to confirm the dialog box.



6 In the Geometry, 3D tab, click Inner Handrail.

7 Enter the distance between the edges of the handrail and the outline polygon as well as the position of the handrail element relative to the front edge of the steps. This defines where the handrail is to begin. In this example, the baluster will be on the first step. Click **OK** to confirm the dialog box.

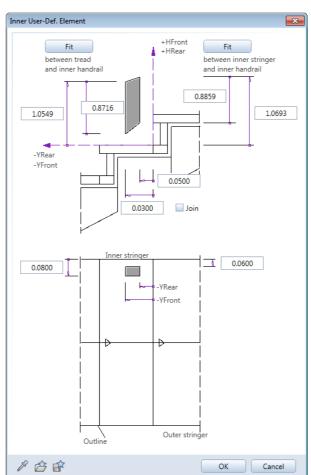


- 8 In the Geometry, 3D tab, click Inner User-Def. (inner user-definable component).
- 9 Enter the distance between the edges of the handrail and the outline polygon as well as the position of the handrail element relative to the front edge of the steps. This defines where the

handrail is to begin. In this example, the baluster will be on the

first step.

Tip: If you change the dimensions of the tread, handrail or user-definable component, you need to select the **Fit** option again in order to re-calculate the result.



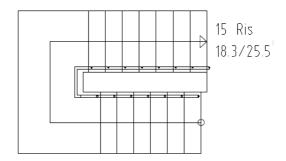
- 10 Click Fit between tread and inner handrail. The program will automatically calculate the height of the component. Click **OK** to
- 11 Click OK to confirm the Stair Components dialog box.
 The components are drawn in, and the Stair Geometry dialog box is displayed again.
- 12 Click Close and acknowledge the prompt by pressing Yes.

confirm the dialog box.

Tip: You can skip the label by pressing ESC.

This locks the stair. The label text is attached to the crosshairs.

- 13 Click in the boxes you want to include in the label.
- 14 Select the number of decimal places.
- 15 Place the label beside the stair.



Creating a section in plan

We will now display a section of the stair in plan as is usual in construction drawings.

To create a section in plan

- 1 Click Section in Plan (Tools palette, Architecture family, Stairs module, Change area) and activate the layer AR_STAIR
- 2 Click the stair's line of travel to identify it.
- 3 In the Section in Plan dialog box, click Properties.
- 4 Open the Representation at bottom tab and specify how the stair is displayed below the section line:

Select the check boxes for Change representation of components at bottom and Change representation of line of travel at bottom.

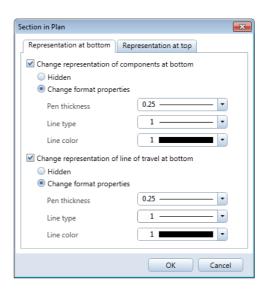
Select the **Change format properties** option in both areas and enter the following:

Tip: To use the line type from the drawing for the initial region, click the **Line Below** button: "-" is displayed.

Pen thickness: 0.25

• Line type: 1

• Line color: 1 black



Tip: To hide a stair component, just click the corresponding option.

5 Open the Representation at top tab and specify how the stair is displayed above the section line:

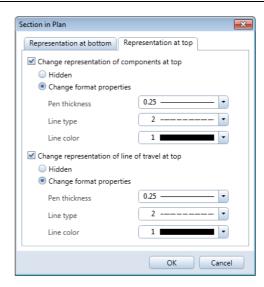
Select the check boxes for Change representation of components at top and Change representation of line of travel at top.

Select the **Change format properties** option in both areas and enter the following:

• Pen thickness: 0.25

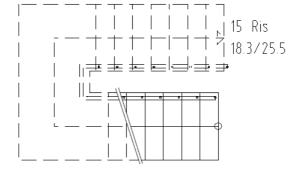
• Line type: 2

Line color: 1 black



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

- 7 Enter the offset between the section lines. This offset is scale-dependent. You must enter it in the current unit (m).
- 8 Click the start and end points of the section lines. The plan view changes accordingly; the elevation view and isometric view stay the same.



Tip: If you change the stair later, you must re-create the section in plan manually using this tool.

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Unit 5: Smart Symbols and SmartParts

The exercises in this unit require the Basic: Walls, Openings, Components module. Check the Palettes to see whether you have licensed this module.

If you do not have Nemetschek's symbol catalogs or if the smart symbols they contain do not meet your requirements, you can use the Smart Window and Door Symbols tool to design your own, custom smart symbols. These smart door and window symbols are saved in libraries and can be retrieved at any time and placed in the workspace. 268 Allplan 2015

Designing smart symbols

Requirement: you have created an opening.

• Select the Smart Window and Door Symbols tool in the Basic: Walls, Openings, Components module and click the opening.

- Set the dimensions of the (door or window) frame and click to transfer this to the 3D view.
- For each element in the window, define horizontal and vertical elements and/or muntins or, in the case of doors, the casement and transfer the settings using ...
- Alternatively, select one of the styles presented in the catalogs and enter settings for the dimensions of the various elements.
 Before you transfer them, you need to enter the dimensions of the individual elements.
- Set pen/color for the elements and glass.
- Save the smart symbol.

In the next exercise you will insert your own smart symbols in the only windowless wall in the building (on the ground floor). The next exercise is essentially a repetition but without smart symbols.

To create window openings

- **⊃** Drawing file 100 Ground floor, model is open. Make layer AR_WALL visible and hide all the other layers.
- 1 Double-click with the right mouse button in the window opening at door height in the straight wall beside the curved wall (do not click the smart symbol!).
- 2 Create three window openings as shown.

The Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked. In the Bottom level area, change the value for Properties are adopted from the element clicked.

Height: Top level: Fixed component height,

Comp. height: 2.26

Bottom level: A Relative to lower plane,

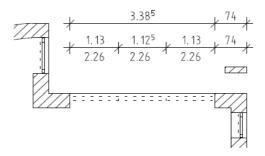
offset: 0.11

Reveal: Depth of window: 0.10

Outer reveal: 0.09

Representation of sill: Outside
Library element 1 to n: switch it off

Position:



3 Press ESC to quit the tool.

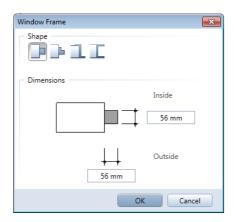
Exercise 8: Designing Smart Symbols

You will now design a three-part glass window for the openings. The smart symbol can then be inserted in any opening.

To make sure that the smart symbols from the Styles catalog and the new smart symbol match, you will use the same settings for the frame thickness, pen/color for element and glass pane etc..

To design a smart window symbol

- 1 Click Smart Window and Door Symbols (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Create area).
- 2 Click the side of one of the new openings. A dialog box is displayed. You can design the entire smart symbol in this dialog box. Start with the window frame.
- 3 Select the block frame for frame type and enter the dimensions: Width: 56 / Depth: 56



4 Click to transfer the settings for the frame to the 3D view on the right.

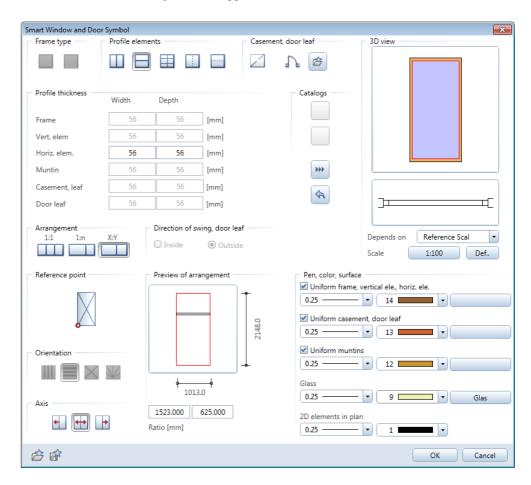
The window is to have horizontal elements (a transom).

Tip: Click to undo your settings one step at a time.

Width: 56 / Depth: 56

Position the transom freely.

6 Set the arrangement to X:Y and enter the value for the height of the upper field: 625 (see illustration).



- 7 Click to transfer the settings for the horizontal element to the 3D view.
- 8 Click in the lower window section in the 3D view. It will be divided by a vertical element.

9	In the Profile elements area, click \square Post and enter the follo-				
	wing dia Width:			Depth:	56
			•	•	

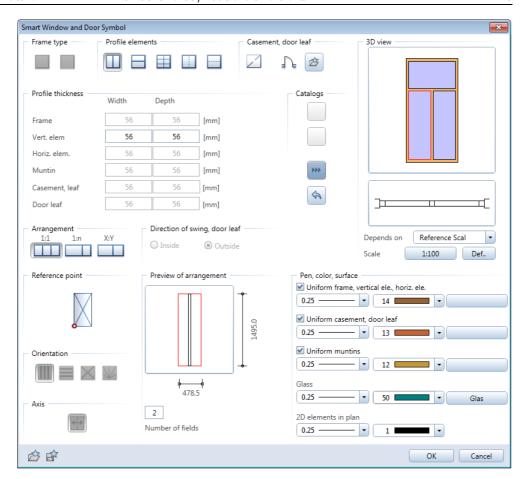
- 10 Set the arrangement to 1:1 □□. The post needs to be centered.
- 11 Click to transfer the settings to the 3D view.
- 12 Select the following settings in the Pen, color, surface area:

Pen 1 and color 14 for the Frame, horizontal elements, vertical elements

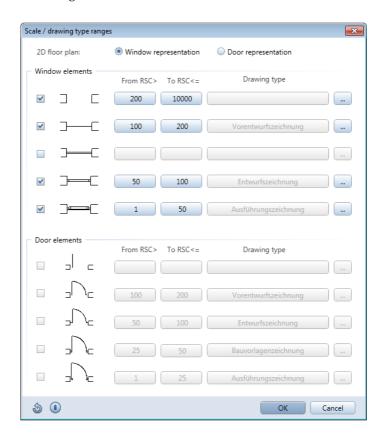
Pen 7 and color 50 for Glass

Pen 1 and color 1 for the 2D elements in plan

Assign the surfaces shown in the illustration to Frame, horizontal elements, vertical elements (oak3_landscape.surf) and Glass (glass.surf). These surfaces are then displayed in the animation.



13 In the 3D view area, click Def and select the check boxes for the scale ranges.



- 14 Click OK to confirm the dialog boxes.
- 15 *<Confirm> setting* Click the right mouse button to confirm.

The Smart Symbols palette opens.

- 16 For example, create a new folder in the **Private** folder. To do this, double-click the **Private** folder.
- 17 Click New group at the bottom of the Smart Symbols palette.
- 18 Enter a name for the new group, for example, Architecture Tutorial and press ENTER to confirm.

- 19 Double-click the new folder.
- 20 Click Save at the bottom of the palette.
- 21 Enter a name for the new smart symbol, for example, Window01 and press ENTER to confirm.
- 22 Press ESC to quit the tool.

Replacing smart symbols, SmartParts

Now you will insert the smart symbol in both openings using the M Insert Smart Symbol, SmartPart in Opening tool (Tools palette, Architecture family, Basic: In other words, you will place the smart symbol.

Smart symbols should be placed on the layer of the opening. If this is not so, you can use



Modify Format Properties, Layer, to assign a different layer.

You can replace smart symbols at any time. The only requirement is the presence of the two smart symbols (one to be replaced and the other to be used as a substitute) in the drawing file.

There are two methods for replacing smart symbols:

- Replace all instances of a smart symbol with another smart symbol - Smart Symbol setting.
- Replace single instances of a smart symbol Instances setting.

A smart symbol that has been placed in a drawing file is an 'instance' of a smart symbol.

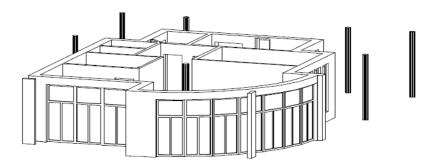
In the following exercise we will replace instances of the smart symbol (in other words, smart symbols inserted in openings) in the curved wall with a different smart symbol.

To replace a smart symbol

- 1 Click Replace Smart Symbol, SmartPart (Tools palette, Architecture family, Basic: Walls, Openings, Components module, Change area).
- 2 Select the Instances setting (click to toggle).



- 3 *Instance of smart symbol to be replaced*Select all instances in the curved wall (enclose them in a selection rectangle or use the brackets feature).
- 4 Replace with which instance of smart symbol? Click an instance (i.e. on of the three windows) of the smart symbol you just created.
- 5 Press ESC to quit the tool.

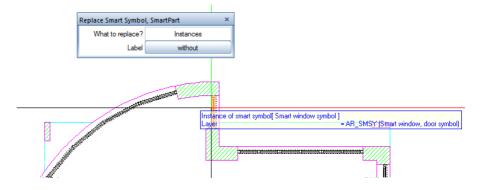


Ground floor: the smart symbols in the curved wall have been replaced.

You can also use the Replace Smart Symbol, SmartPart tool to replace smart symbols with SmartParts.

To replace a smart symbol with a SmartPart

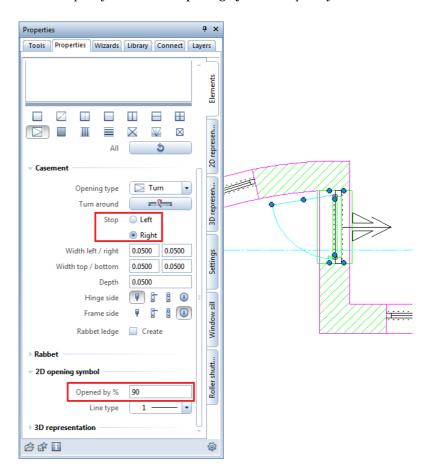
- 1 Click Replace Smart Symbol, SmartPart.
- 2 Select the **Instances** setting.
- 3 *Instance of smart symbol to be replaced*Click the instance of the smart symbol to the right of the curved wall.



- 4 You want to replace the smart symbol with a window SmartPart. Click an instance of the window SmartPart.
- 5 Press ESC to quit the tool.
- 6 To adjust the opening direction, double-click the SmartPart.

 The Properties palette of the SmartPart opens.
- 7 Select the Elements tab.

8 In the Casement area, set the stop position from Right to Left and specify that the 2D opening symbol is open by 90%.

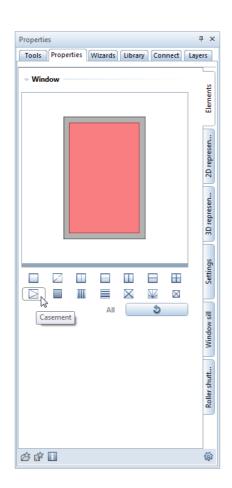


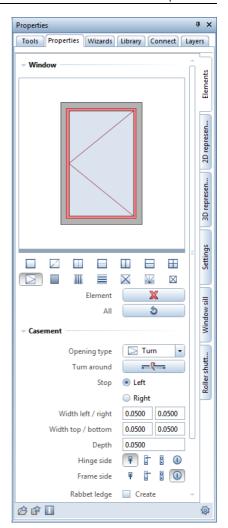
9 Press ESC to finish modifying the SmartPart.

Modeling and changing SmartParts

Using the Window SmartPart and Door SmartPart tools, you can create window and door SmartParts in a way similar to smart symbols you create for openings using the Smart Window and Door Symbols tool: here, too, you first select the part you want to edit in the preview and then insert the elements in the selected part by clicking the relevant icon.

The following illustration shows two stages of the Properties tab of the Window, single casement SmartPart so that you can see the differences between the initial state with an empty frame and the finished SmartPart.





You can also double-click a placed SmartPart, make the necessary changes in the Properties palette and then add this SmartPart to the library using Insert SmartPart.

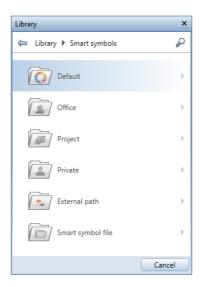
Library palette

You can find an overview of all the symbols, smart symbols and SmartParts in the libraries.

Open the Library palette.

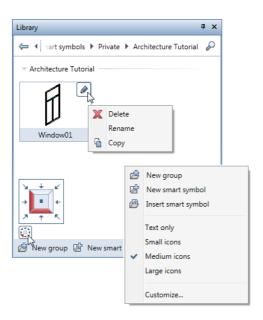


For example, the Smart symbols folder contains all folders where smart symbols are saved.



The area at the top helps you navigate through the Library palette: Back takes you up one level in the hierarchy; use Find to find a name in the current folder and its subfolders.

If you have selected a smart symbol, for example, the palette provides a number of tools you can use to modify and display the smart symbol in the library:



Using View you can set a view for the preview. The view is independent of the view set in the viewport. When you point to a folder or library element, the Modify tool appears. Clicking this icon opens a shortcut menu. Using the tools provided, you can copy, rename and delete the relevant folder or element.

The shortcut menu that is available in folders where you can select library elements provides the tools you can also find at the bottom of the palette as well as a number of additional tools you can use to define the size of the graphical previews or hide them altogether. In addition, you can customize the palettes for your needs. To do this, select the Customize... tool on the Tools menu and open the Palettes tab.

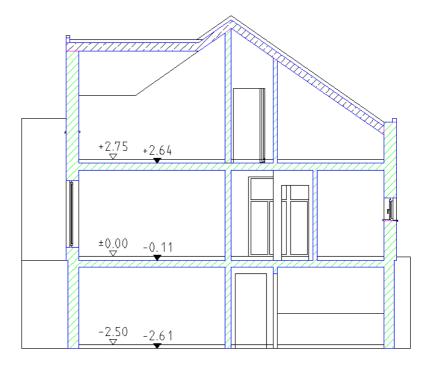
Note: Library elements in the Default folder can only be copied but not modified.

Advanced information on the library palette can be found in the help for Allplan.

Unit 6: Sections and Views

Although the building model is now finished, there are still a number of important tasks you have to accomplish to produce a polished construction drawing.

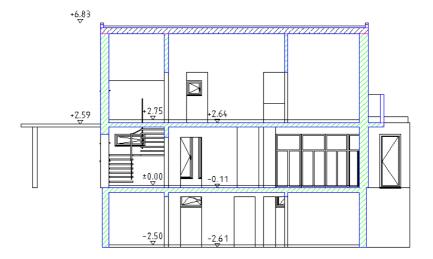
This unit shows how to create sections and views. An additional step involves calculating floor area and areas. These can be output to the drawing file or in the form of reports.



Section A-A with elevation dimensioning

Exercise 9: Sections

Section views of a building show it as if viewed from a specific viewing direction. A section clipping path defines the view and this can be saved as a hidden-line image in a separate drawing file. The manner in which intersected elements are displayed - for example, their hatching - can also be defined for the section view. If you want, you can also choose to display intersected elements with a thick line.



Section B-B

First, all the drawing files with the elements you want to include in the section need to be opened in edit mode and the layers have to be made visible. The clipping path itself is in a separate drawing file, which is current. It is is defined by setting parameters.

To define a section

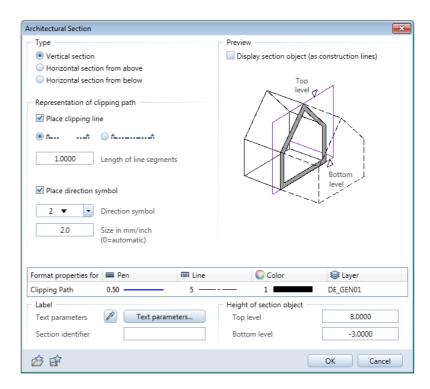
- In the Tools palette, select the General: Roofs, Planes, Sections module.
 - Make drawing file 2 Section clipping path current and open drawing files 100, 101, 109, 110, 112, 116, 120 and 129 in edit mode.
- 1 Open the Layers palette, click Select Layer Print Set and select the print set Model (all layers with 3D components).
- 2 Open the Window menu and click 1 Viewports.
- 3 Click Clipping Path (Tools palette, Architecture family, General: Roofs, Planes, Sections module, Create area).
- 4 Activate the layer DE_GEN01.
- 5 Click Properties and specify the following settings:
 - In the Type area: Vertical section
 - Representation of clipping path area:
 Select the Place clipping line option
 Select the dashed clipping line (the first option)
 Length of line segments: 1

Select the Place direction symbol option Select Direction symbol 2 Size in mm: 2

• Format properties area: Clipping Path

Pen: 0.50 Line type: 5 Color: 1 black Layer: DE_GEN01

6 Click OK to confirm.



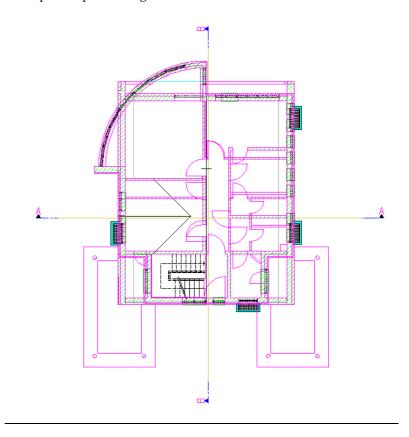
Tip: You can define orthogonal sections as well as sections at angles.

To produce a section which shows the entire building, you need to set the upper edge of the section objects at least 20 cm above the ridge and the lower edge below the bottom of the building.

- 7 Click the start and end points of the section line beyond the building and press ESC to finish. Make sure the section line intersects the walls at right angles and not in an oblique manner.
- 8 Depth / viewing direction
 Click a point above the building.
 The section depth defines an area behind the section line that includes all the visible building elements in the final section view.
 The greater the depth of the section, the larger the volume of data generated.
- 9 Section identifier Enter A.

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10 Repeat steps 3 through 7 and enter the section identifier: B.



Activating sections

The section is a three-dimensional wireframe model. Based on this wireframe model, you can create a hidden-line image and save it in a separate drawing file. This will create a 2D image that can be edited using the tools in the Draft, Text and Dimension Lines modules.

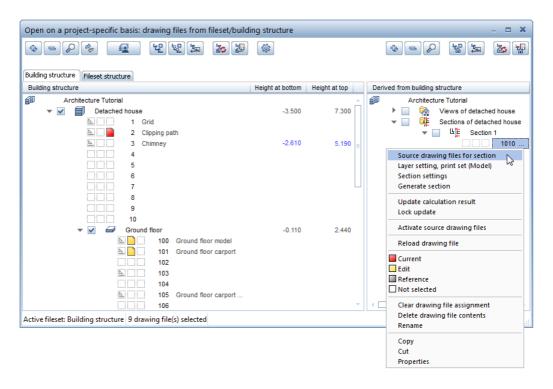
The building structure also provides drawing files for views and sections. They are listed on the right-hand side of the Open on a project-specific basis: drawing files from fileset/building structure dialog box (Open on a Project-Specific Basis tool) in the Derived from building structure area in the Detached house - Sections and Detached house - Views folders. You can create views and sections using the shortcut menus of these drawing files.

To activate and save a section

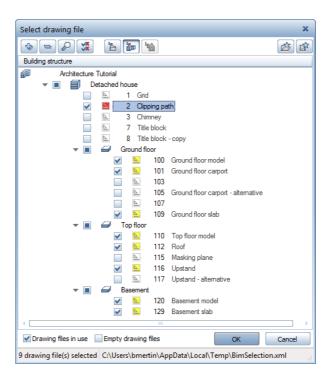
- 1 Select Den on a Project-Specific Basis.
- 2 On the right-hand side under Derived from building structure open the Detached house Sections folder, Section 1.

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3 Open the shortcut menu of drawing file 1010 and select Source drawing files for section.

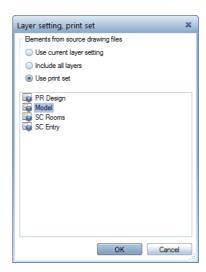


4 Click drawing files 2, 100, 101, 109, 110, 112, 116, 120 and 129. Then click **OK** to close.



5 Open the shortcut menu of drawing file 1010 again and activate Layer setting, print set (current),

6 In the Layer setting, print set dialog box, select the Use print set option and click the print set Model.



After re-opening the shortcut menu of drawing file 1010, you will see that the selected print set has been entered: Layer setting, print set (model).

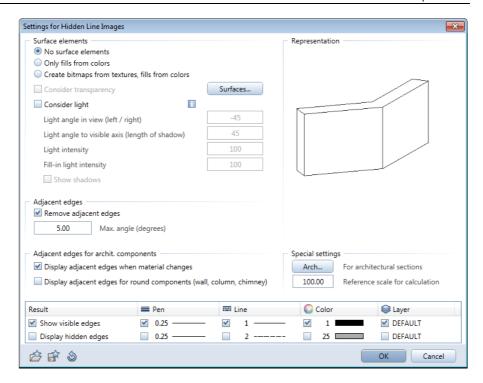
- 7 The next step involves section settings. Open the shortcut menu of drawing file 1010 and select Section settings.
- 8 The Settings for Hidden Line Images dialog box opens. Select the following options:
 - Surface elements area: Select the No surface elements option
 - Adjacent edges area:

Select the Remove adjacent edges option

Max. angle: 5 degrees

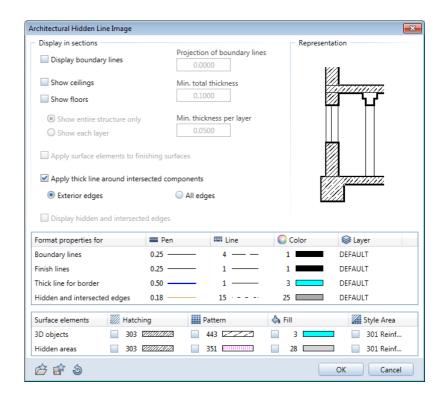
To represent curves in hidden line images as smooth surfaces instead of faceted, adjust the max. merge angle to 5 degrees, for example.

- Adjacent edges for archit. components area:
 Select the Display edges when material changes option
- Select the Display visible edges option



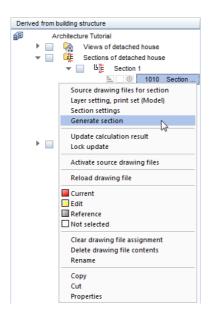
Tip: Finish specifications you define using the Room tool can also be displayed in sections. This way, you do not need to edit sections later.

9 In the Special settings area click the Arch... button and select the Apply thick line around intersected components option. Set the other options as shown.



10 Click **OK** to close the dialog box.

11 After you have made all the settings for the sections, open the shortcut menu of drawing file 1010 and select Generate section.



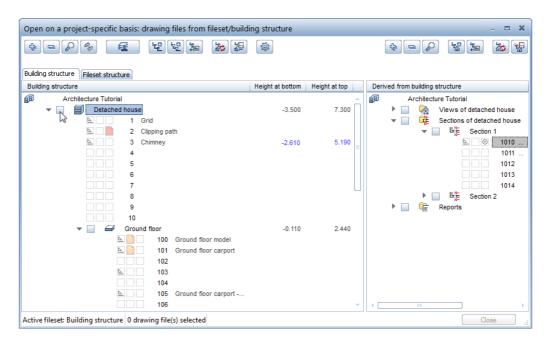
12 Select Section A and click OK to confirm.



Drawing file 1010 automatically gets the following name: Section: A (result of hidden line calculation).

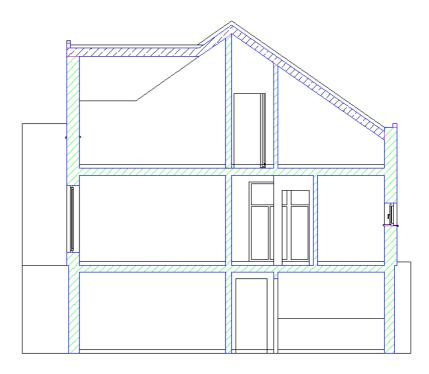
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13 Clear the check box on the left-hand side next to **Detached house** under **Building structure**. This will hide all drawing files activated under **Building structure**.



14 Make drawing file 1010 Section: A (result of hidden line calculation current.

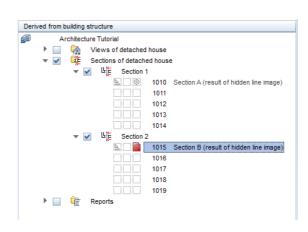
Close the dialog box.



Section A-A

The result of the hidden line image is shown in drawing file 1010 Section: A (result of hidden line calculation).

Tip: If the drawing file looks empty, check that the view is set to Plan. If it is, the reason for this may be 2D data. In this case, click Show/Hide and select the 2D elements in 3D views option.



15 Repeat steps 3 to 14 for drawing file 1015 and Section B.

The section view will not update automatically to reflect alterations you make to the floor plan.

If you have made alterations to a drawing file already in use as the source drawing file in the section calculation, you can update the section in plan using the Update calculation result tool (shortcut menu Section n).

For example, if you want to use another drawing file as the source drawing file in the section calculation, you must carry out the section calculation again as described above.

Note: Sections can also be created with the Section Display tool (viewport toolbar).



To assign the result to a separate drawing file, select the Hidden Line Image, Wireframe tool (Default toolbar) and then Hidden Line Image.

The section will **not** update automatically to reflect any changes you make to the floor plan. You need to calculate the section again and update the drawing file using Hidden Line Image, Wireframe and Update Hidden Line Image.

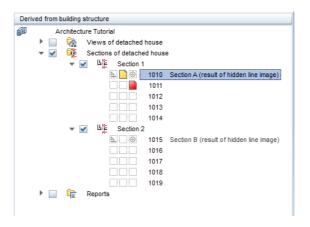
Editing the section

You can now edit the section view. Draw the new elements on a separate drawing file. Otherwise, these will be deleted when the drawing file with the image is updated.

First draw the finished floor in the section.

To create elevation dimensioning

- 1 Select Den on a Project-Specific Basis.
- 2 On the right-hand side under Derived from building structure open the Detached house Sections folder, Section 1.
- 3 Make drawing file 1011 current and set 1010 to edit mode.



- 4 Rename drawing file 1011 and close the dialog box.
- 5 Draw the finished floor.
- 6 In the Tools palette, activate the Dimension Lines module (Basic family).
- 7 Click Elevation Point (Create area).



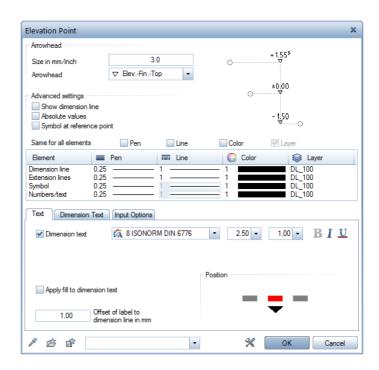
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- 9 Then click Properties.
- 10 Select the Arrowhead (mark for finished floor) in the top part of the dialog box, set the format properties and activate the layer DL_100 (see illustration).

Open the Text tab and specify the following settings:

 Select the Dimension text option Font: 8 ISONORM DIN 6776

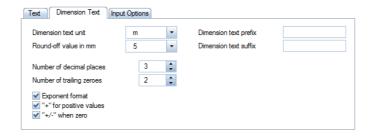
Text height: 2.50 Aspect: 1.00



- 11 Specify the following settings on the Dimension Text and Input Options tabs.
 - Dimension Text tab

Dimension text unit: m Round-off value in mm: 5 Number of decimal places: 3 Number of trailing zeros: 2

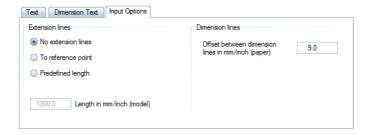
Select all three options.



• Input Options tab

Extension lines area: Select the No extension lines option

Dimension lines area: Offset between dimension lines: 9 mm



Click OK to confirm.

12 Place a point through which the dimension line is to pass. The Elevation Point Context toolbar changes.

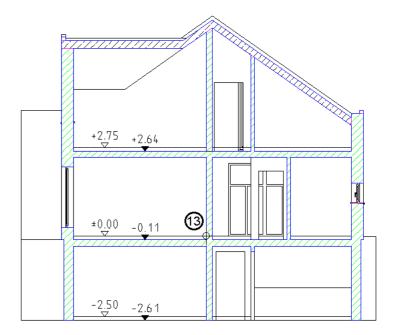
Architecture Tutorial Unit 6: Sections and Views 301



13 Reference point

This is a point that is assigned a value that you know. First enter the base value in the context toolbar: **0.00** Then click a point of the finished floor in the ground floor.

14 Click the points to be dimensioned and press ESC to close dimension strings.



- 15 In the Properties or on the Context toolbar, change the arrowhead and dimension the uncovered floor (steps 12-14).
- 16 Press ESC to finish and quit the tool.

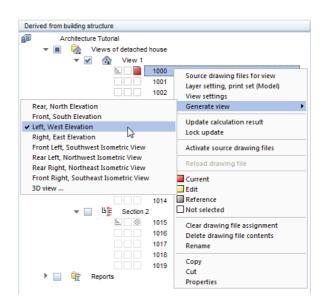
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Exercise 10: Views

You can also use the building structure to create views. The procedure is similar to creating sections.

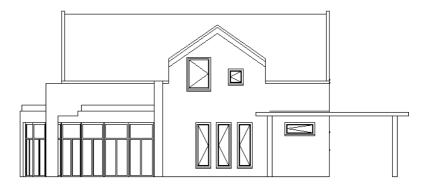
Procedure to follow when creating views

- Upen on a Project-Specific Basis, Derived from building structure, Detached house Views folder, View 1.
- Open the shortcut menu of drawing file 1000 and select Source drawing files for view.
- Select the drawing files that contain the elements you want to display in the view.
- Open the shortcut menu of drawing file 1000 and select Layer setting, print set (current) and then the Model print set
- Open the shortcut menu of drawing file 1000 and select View settings.
- Open the shortcut menu of drawing file 1000 and select Generate view



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• Drawing file 1000 automatically gets the name of the selected view.



West elevation



North elevation

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Unit 7: Area Calculation and Quantity Takeoff

The rooms will be created on a separate layer in the drawing file with the walls. This will ensure that all the design components are included in the calculation.

Two methods are provided for creating rooms:

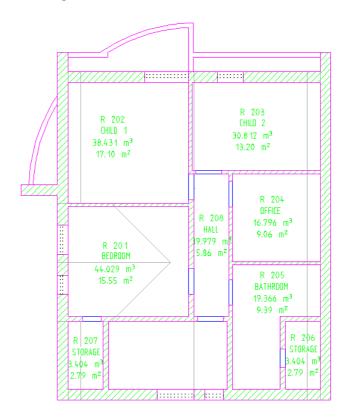
- Manually enter polygons to define the boundary of each room separately. The rooms can be labeled immediately and assigned finish specifications.
- Automatically the system scans the drawing file for closed wall polygons and creates rooms on the basis of the wall polygons it detects. The rooms can only be labeled and assigned finish specifications later.

Exercise 11: rooms, finish and floor space

Important notes on defining rooms

- In either case, you have to enter the height of the room first. You enter the height as you would for any other architectural element

 you can even associate the height of rooms with reference planes or with other elements.
- It is advisable to work with reference planes consistently and to use a transparent plane concept for both components and rooms.
- So that you can differentiate visually between the rooms and the other elements on-screen, you should draw rooms using a different pen color.



You can only calculate areas according to floor area regulations and output the results to reports when you have defined rooms and entered finish specifications (for determining the finished dimensions).

Defining rooms one by one

In the exercises that follow, you will assign a finish to different surfaces on the top floor and calculate the floor area. Here, you could employ the automatic room-generation approach. However, you will also consider the manual approach so that you can decide for yourself which is the more effective.

You will start by defining single rooms and labeling their wall surfaces, floors and ceilings. Then, you will create the other rooms automatically.

To create rooms

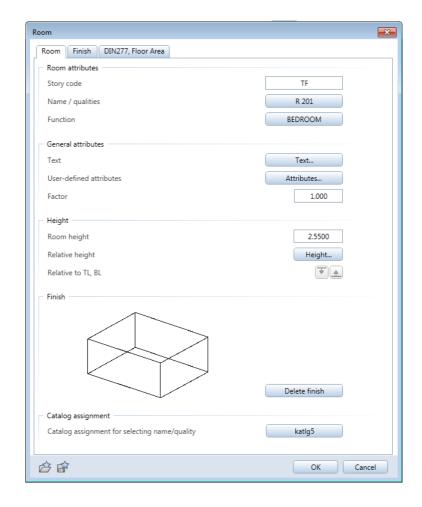
- Use Gopen on a Project-Specific Basis to open the drawing file 110 Top floor model.
- Open the Layers palette, click Select Layer Print Set and select the print set SC Rooms.
- ⇒ In the Tools palette, select the Rooms, Surfaces, Stories module (Architecture family).
- 1 Click Room (Create area) and activate the layer RO_ROOM (Format tab).
- 2 Select pen (3) **0.50** (Format toolbar).
- 3 Click Properties.

Now enter properties for the room.

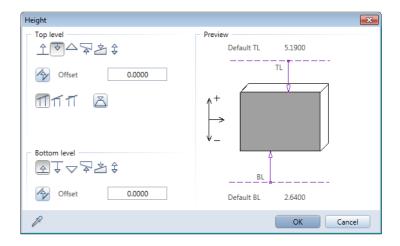
4 In the Story code box, enter Top floor. Click the Name / qualities box and enter the number of the room: R 201.

5 Click Function and use to add a new entry to the list: BE-DROOM.

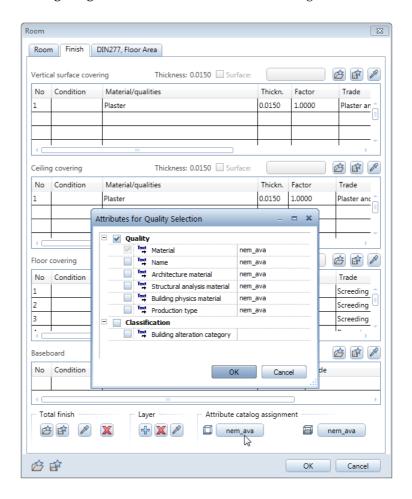
Tip: Entering a factor is useful for areas like balconies, for example, that only count partially.



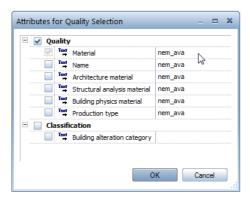
6 Click Height and define the top and bottom levels of the room in such a way that they match the settings defined for the walls on the top floor.



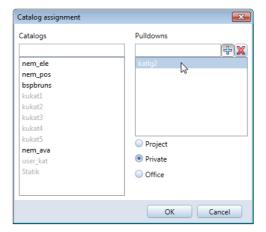
7 Switch to the Finish tab. Click the left button in the Attribute catalog assignment area at the bottom of the dialog box.



8 In the Attributes for Quality Selection dialog box, click the entry in the right-hand column next to Material



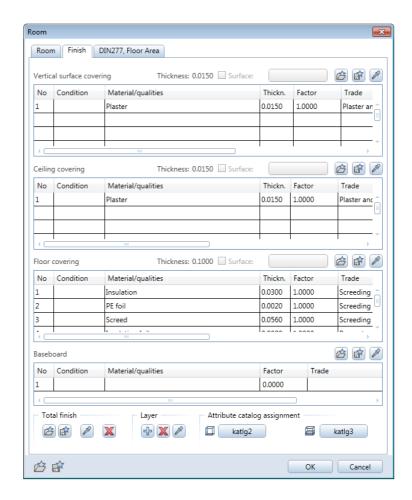
9 Assign a catalog for vertical surfaces, ceilings and floors.



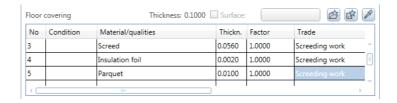
10 Repeat steps 7 to 9 for Baseboard.

Select catalog katlg3 in the Catalog assignment dialog box.

11 Make settings for the covering of ceiling, floor and vertical surfaces.

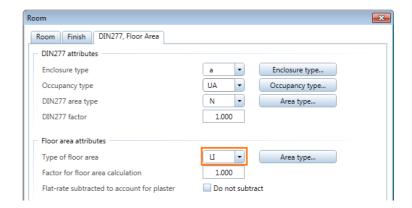


The floor covering consists of a total of 5 materials.

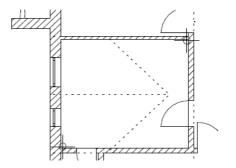


Tip: Use if to save combinations of settings as favorites. The settings for entire rooms as well as those for individual surfaces can be saved as favorites. With large-scale projects in particular, this saves time and increases quality as all those involved can access the same settings.

12 Select the DIN277, Floor Area tab.
In the Floor area attributes area, set the Type of floor area to LI (for living space).



- 13 Click **OK** to confirm the dialog box.
- 14 In plan, click the diagonally opposite corners of the room under the dormer and press ESC.



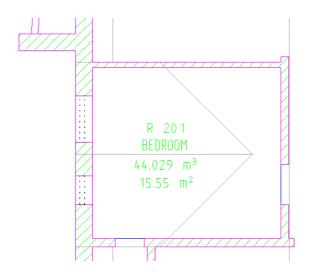
15 Make settings for the label. The label in this exercise will include information on the name, function, volume and area of the room.

Click in the relevant boxes to exclude them from the label.

Tip: Click to switch to the text parameters.



- 16 Activate the layer AR_LABEL for the label.
- 17 Click in the room to place the label (a preview of the label is displayed attached to the crosshairs).



18 Press ESC to quit the tool.

Creating rooms automatically

In the next exercise you will create the other rooms automatically. This involves two steps:

- Define all the rooms using Auto-Room.
- Label the rooms using Redefine Rooms, Surfaces, Stories.
 You can define the finish immediately when creating labels or later using special tools.

To create rooms automatically

- 1 Click Auto-Room (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area).
- 2 Activate the layer RO_ROOM (Format toolbar).
- 3 Click Height in the input options and check the height setting.
- 4 Enclose the design in a selection rectangle. Make sure that you do not select any parts of the balconies. Allplan creates the rooms and quits the tool.

Note: Auto-Room will not change any rooms you have already defined.

Finish Specifications

You have already defined the finish of the single room; in other words, you have assigned vertical surfaces, ceilings and floors (as well as baseboard).

These surfaces are given properties (for example, material, building trade and thickness). This information is used when calculating floor space and performing quantity takeoff calculations.

The rooms you have defined automatically have not yet been assigned any finish specifications.

Surfaces in rooms can be defined in two manners:

- By defining them as a single entity for an entire room.
 - The easiest method is to define finish specifications when you enter a room using the Room tool, Finish tab; however, you can also do this later using the Finish Specifications tool.
 When modifying rooms, you can also define or change the finish for an entire room using Redefine Rooms, Surfaces, Stories, Finish tab.
- By defining them one by one this will allow you to define separate surfaces within the same area - for example, a tiling pattern up to a specific height.
 - Special surfaces are entered using the Vertical Surface, Ceiling, Floor or Baseboard tools.

In the exercises that follow, you will learn how to employ the different methods.

Tip: You can use this approach to modify surfaces that have been created using Room.

Finish specifications for an entire room (as a modification)

The next step is to label the rooms created automatically. You will copy the finish settings from the existing room named "BEDROOM" and assign them to the rooms while creating the labels.

To label and assign finish specifications to rooms

- 1 Click Redefine Rooms, Surfaces, Stories (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Change area).
- 2 Make sure that the Room filter is selected on the context toolbar.



3 Click Match Properties and then click within the room called BEDROOM.

All the attributes of the "BEDROOM" (name, finish, type of area) are copied.

4 Click Properties.

Enter a name in the Room tab:

R 202. Enter CHILD 1 for the function. You can permanently add entries to the list using $\frac{1}{2}$.

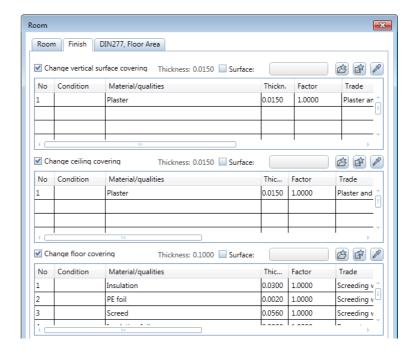
Select the check boxes beside Name / qualities and Function so that these attributes are transferred to the new room.



5 Switch to the Finish tab.

The finish you defined for "BEDROOM" is displayed; changes are not necessary at the moment.

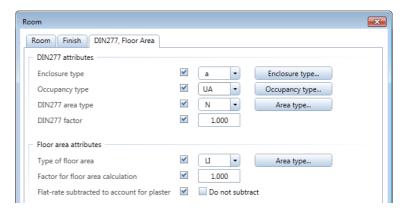
Make sure that you select the check box for each finishing surface you want to transfer to the new room.



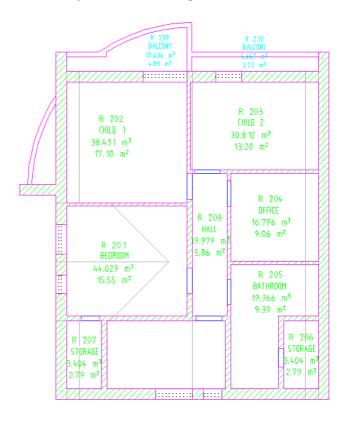
6 Check the settings on the DIN277, Floor Area tab:

The program also took the LI area type from the "BEDROOM".

Here, too, make sure that the corresponding check boxes are selected.



- 7 Click in the room at top left and click the right mouse button to confirm.
- 8 Select the layer AR_LABEL and place the label.



9 Repeat steps 4, 7 and 8 with the other rooms.

Enter the room numbers and room functions as shown in the illustration above.

Make sure that you switch between the RO_ROOM (for rooms) and AR_LABEL (for room labels) layers.

The settings you defined for finish and type of area are retained until you change them. Allplan assigns them automatically to the modified room together with the label.

A value to account for plaster is not to be subtracted from the overall area of room 205 Bathroom in subsequent floor area calculations: select the Do not subtract check box in the Floor area attributes area in the DIN277, Floor Area tab.

10 Press ESC to quit the tool.

You will define the balcony as a separate room. Specify a function and name in the Finish tab and delete all the finish specifications using the Delete Finish button. Switch to the DIN277, Floor Area tab and set the Factor for area calculation in the Floor area attributes area to 0.5.

Finish specifications for an entire room

The ceilings and vertical surfaces of the bathroom will get the same coat of plaster as the other rooms. The floor covering, however, will be different from the parquet floor of the other rooms you have defined so far.

In addition, you will apply a tiling pattern that is max. 2 m high to the walls of the bathroom. To create this tiling pattern, you need to enter the height relative to the room.

Using the "bathroom" as an example, the section that follows explain the procedure for creating finish specifications and special surfaces.

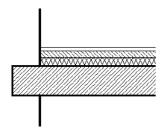
To define finish specifications

- Open the Options, Rooms page, Room finish area and select the Calculate vertical surfaces only at adjacent components option. This ensures that vertical finish surfaces are only calculated in places where there are walls.
- 1 Click Finish Specifications (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Change area).
- 2 Define the required surfaces in the dialog box (see following tables and illustration in step 3). The entries you make apply to the entire surface or to all the sides in the room.

Assign/remove vertical surface covering area:

No.	Material/ Qualities	Thick- ness	Factor	Trade
1	Plaster	0.0150	1	Plaster and stucco work
2	Mortar bed	0.0010	1	Tiling work
3	Wall tiles	0.0300	1	Tiling work

Tip: You can also include ceilings and floors (finish specifications) in sections. When you generate the section using the building structure (see "Activating sections" on page 288), you need to make appropriate settings in the Section settings tool, which you can select using the shortcut menu of the section drawing file. When you create the section using the Section Display (see "Activating sections" on page 288) (at bottom right in the viewport) and W Hidden Line Image, Wireframe tools (Default toolbar), you can make appropriate settings in Special settings for archit. elements.



Assign/remove ceiling covering area:

No.	Material/ Qualities	Thick- ness	Factor	Trade
1	Plaster	0.0150	1	Plaster and stucco work

Assign/remove floor covering area:

No.	Material/ Qualities	Thick- ness	Factor	Trade
1	Insulation	0.0300	1	Screeding work
2	PE foil	0.0020	1	Screeding work
3	Screed	0.0560	1	Screeding work
4	Mortar bed	0.0100	1	Tiling work
5	Tiles	0.0100	1	Tiling work

The tiling pattern is not as high as the entire wall but it is applied to all the sides in the room. You can therefore use this tool to define it as a finishing surface.

Note: Tiling patterns or other surfaces that differ in height or that are not applied to all the sides in a room are defined separately as special surfaces (see section below).

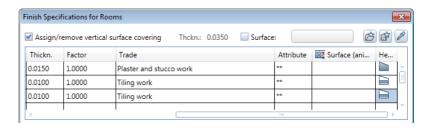
Note: Do not forget to select the relevant check boxes!

Note: When you move the horizontal slide bars to the right, additional columns appear.

You can assign animation surfaces to ceilings, floors and vertical surfaces. In addition, ceilings and floors can be assigned hatching styles, patterns or fills for display in section views. You can also define the height of vertical surfaces relative to the room.

Note: Surfaces you have already defined are overwritten as soon as you activate the check box for the surface in the dialog box – regardless whether or not there are assignments in the dialog box.

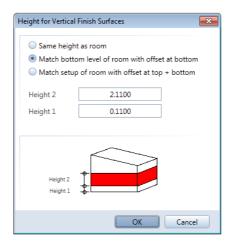
- 3 Enter the vertical surfaces with the tiling pattern as follows:
 - The coat of plaster is applied to the full height of the room. There are no particular issues to bear in mind (default setting).
 - The situation is different with the mortar and the tiles. To enter the height relative to the room, move the slide bar to the right and click the Height column.



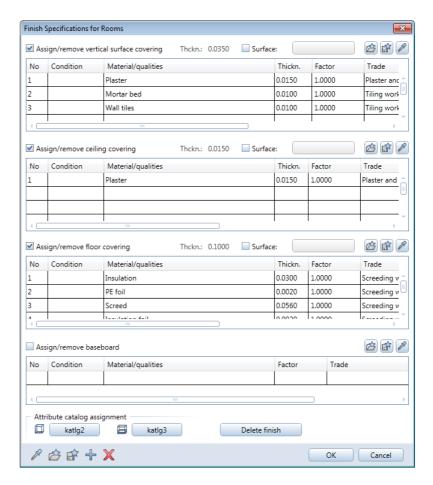
• Set the height as follows:

Select the Match bottom level of room with offset at bottom option

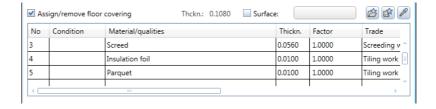
Height 2: 2.11 Height 1: 0.11



The dialog box should now look like this:



The Assign/remove floor covering area includes 5 materials.



4 Click OK to confirm.

Tip: You can apply finish specifications to a whole series of rooms in one go. To do this, simply enclose the rooms in a selection rectangle and/or use the Brackets tool.

- 5 Click in the Bathroom.
- 6 Click the right mouse button to confirm.

 The finish specifications are assigned to the surfaces in the bathroom, even though they are invisible.
- 7 Press ESC to quit the tool.

Alternative: finish specifications for specific surfaces (special surfaces)

You will only apply the tiling pattern (that is max. 2 m high) to the walls with sanitary objects. You will enter these surfaces as special vertical surfaces.

As parts of the bathroom are located under sloping walls, you will define the height using the maximum component height option.

Special surfaces have a higher priority than finishing surfaces. Placing a special surface on top of a finishing surface makes a "hole" in the finishing surface.

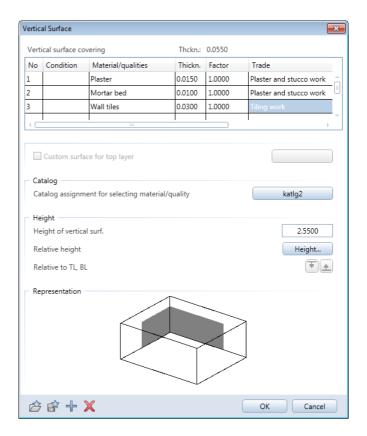
Vertical surfaces

- 1 Click Vertical Surface (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area) and activate the layer RO_VERSU.
- 2 Click Properties.

Tip: Select a different pen (e.g. pen 8, green) for the plan view.

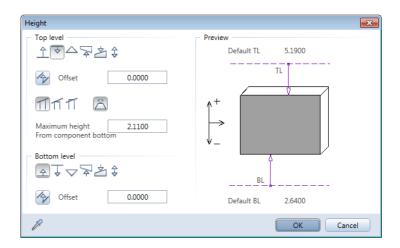
3 Specify the Material, Thickness and Trade for each layer/coat of the surface.

The system will apply the surface to the area of the unfinished structure without taking the coat of plaster (defined earlier for calculating the area) into account. The plaster should therefore be entered as the first layer/coat in the surface properties. Using this approach, you can re-define just specific parts of a surface from scratch.



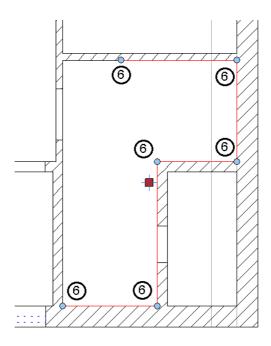
4 Click Height and make the following settings:

- Top level: Relative to upper plane but only up to 2 m from finished floor (= 2.11 m from unfinished floor). Therefore, click
- A Maximum component height and enter 2.11.



5 Click **OK** to confirm all the dialog boxes.

6 Click the points defining the outline of the surface in plan. To specify the first point, roughly click 2 m from the top right corner (where the bathtub ends). Press ESC to close the polyline.



7 Place the label and then press ESC to finish. If you do not want to apply a label, just press ESC.

Area calculation according to residential space ordinance

The regulations for calculating the floor area (residential space ordinance) came into effect on January 1st, 2004. As opposed to the old regulations, you now need to use clear dimensions in calculations, and a flat-rate amount to account for plaster is no longer permitted.

Using the finish specifications you have defined for every room, you can quickly and easily perform area and floor area calculations according to the new regulations.

Allplan 2015 offers various reports for area and floor area calculations. Each report provides the following options:

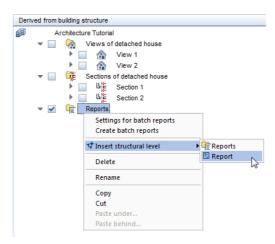
- For calculations according to the residential space ordinance, use the precise finished dimensions, which are calculated based on the finish specifications and/or vertical surfaces, floors and ceilings (based on finished dimensions).
- However, you can still use all the options provided for calculating
 the floor area based on the second calculation directive:
 A value subtracted to account for plaster and covering (based on
 unfinished dimensions less a percentage for plaster to be subtracted from the overall area)
- Area of structure (based on unfinished dimensions)

To calculate floor area

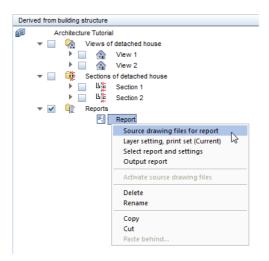
1 Select Open on a Project-Specific Basis.

The Derived from building structure area on the right of the dialog box already contains the Reports structural level.

2 Open the shortcut menu of Reports, point to ***** Insert structural level and click Report.

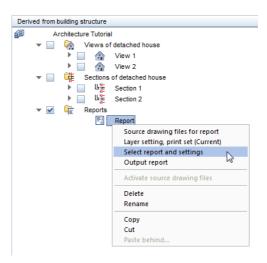


3 Open the shortcut menu of Report and select Source drawing files for report.

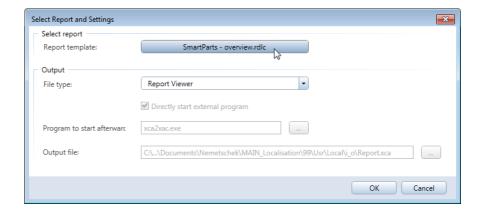


4 Select the drawing file 110 Top floor model in the Select file dialog box.

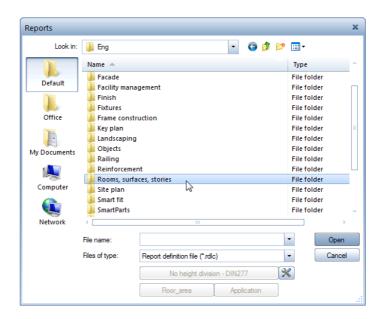
5 Open the shortcut menu of Report again and click Select report and settings.



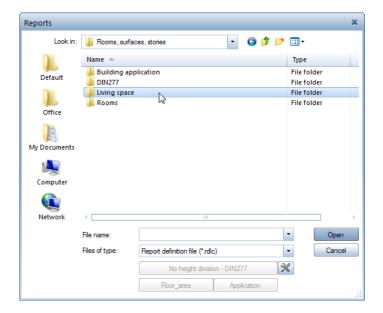
6 The Select Report and Settings dialog box opens. Click the button in the Select report area.



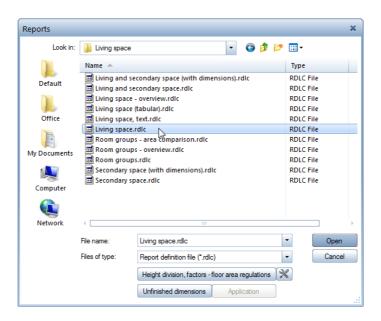
7 In the Reports dialog box, select the Default folder and then the Rooms, surfaces, stories folder.



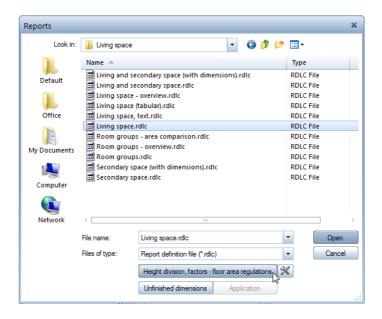
8 Select the Living space folder.



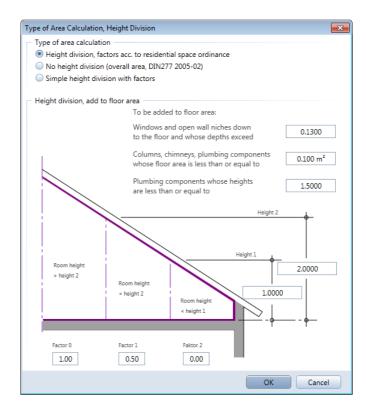
9 Select the Living space.rdlc file.



10 Click the following button to define how areas are to be calculated:

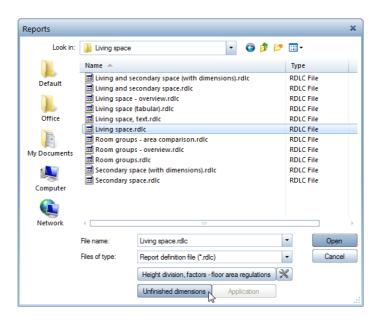


11 You can modify each factor.

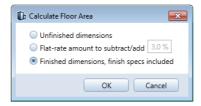


12 Click OK to close.

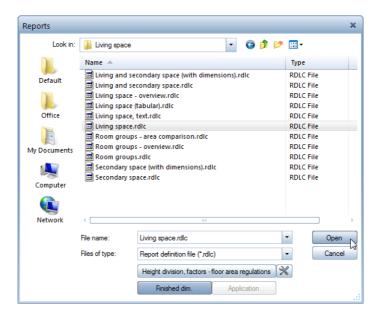
13 Click the following button in the Reports dialog box:



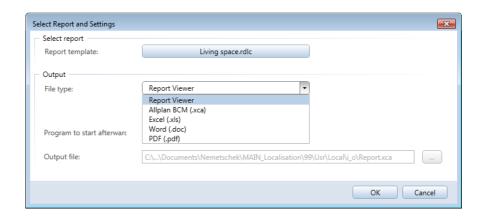
14 In the Calculate Floor Area dialog box, select the Finished dimensions, finish specs included option and click OK to close the dialog box.



15 Close the Reports dialog box by clicking Open.

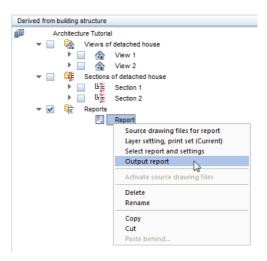


16 You are back in the Select Report and Settings dialog box. Select the Report Viewer option in the Output area.

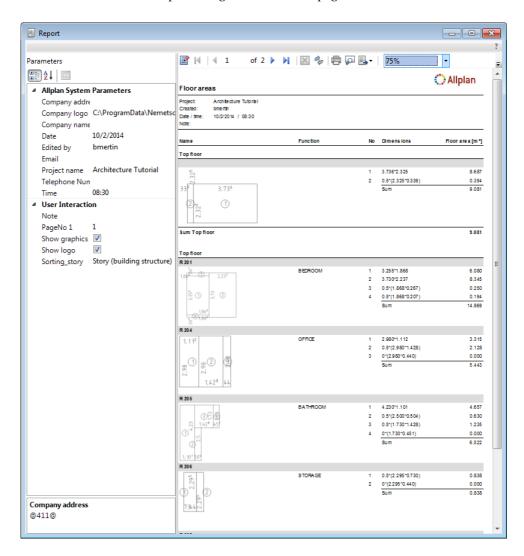


17 Click OK to close the Select Report and Settings dialog box.

18 Open the shortcut menu of Report and select Output report.



The report is displayed in a separate window. Use the arrows at the top to navigate between the pages.



The report can be printed, placed in the document, transferred to Excel or Word or saved as a PDF file.

You can use the **Layout Designer** to change and save report templates. You can modify the layout and, to a certain degree, the contents of existing cells.

Using the Properties palette, you can change the Allplan system parameters such as project name and edited by. By default, these parameters are taken from Allplan attributes. In the User Interaction area, you can show and hide the logo and control page numbering.

The palette is only displayed when the report contains parameters that can be changed.

- 19 Close the Report.
- 20 The Open on a project-specific basis: drawing files from file-set/building structure dialog box is still open.

 Enter a name for the report you just created, for example, Floor area.

Note: You can also use the Area Calculation, Application tool (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area) to create reports for floor area calculations.

Exercise 12: quantity takeoff

Reports

You can use the Reports tool to analyze the building model based on different criteria in all the architecture modules.

Allplan 2015 comes with a wide range of predefined standard reports, which are sorted by topic and arranged in folders. You can also create your own, custom reports and save them in the Office folder.

Tip: You can find advanced information on architectural reports in the Allplan help; please refer to the section "Available reports, overview".

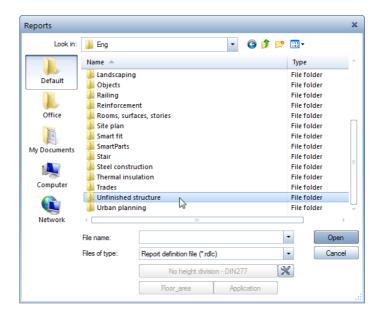
How to generate reports

- Open the drawing files with the elements to be included in the calculation. The operation will only work when the criteria you are looking for are actually met in the drawing files.
- Activate Reports and select a report. The entry you choose lays down the criteria according to which the system will scan the drawing files for elements.
- Optional: use Pind Elements to enter additional filter criteria.
- Define the area of the drawing files to be searched (entire drawing file or just parts of it).
- Print the report, display it in the drawing file or save it as an ASCII or Excel file.

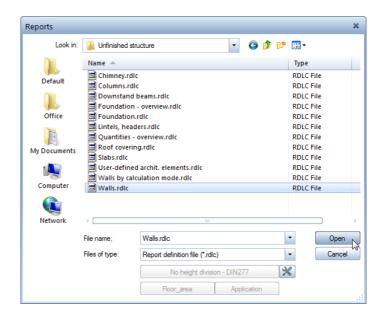
The exercises that follow show how to use reports and you will learn how to enter search criteria.

To generate a standard report

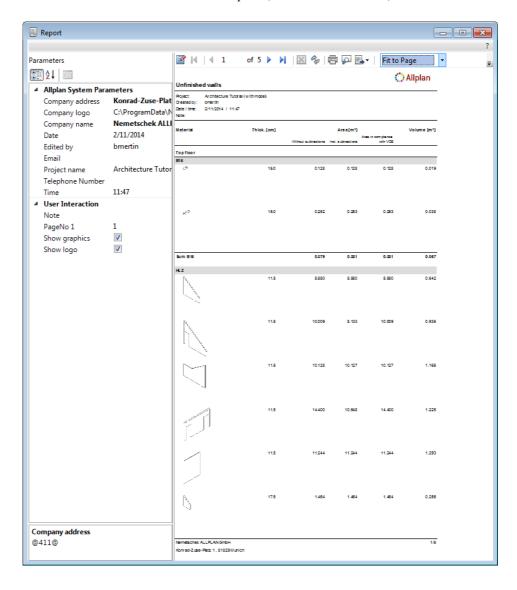
- **○** Open drawing file 110 Top floor model and close the others.
- **⊃** Make the layer AR_WALL visible. Hide the other layers.
- 1 Click Reports (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area).
- 2 In the Reports dialog box, select the Default folder and then the Unfinished structure folder.



3 Select the Walls.rdle file in the Reports dialog box. and click Open.



4 Click All in the input options or click twice with the right mouse button in the workspace (do not double-click!!).



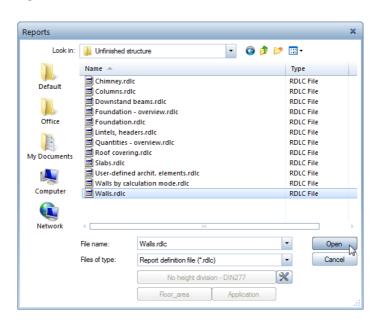
The report is displayed in the Report dialog box on screen. The report options were covered in the section "Area calculation according to regulations". Detailed information on the Report dialog box is provided in the Allplan help; see the section "Report Viewer".

5 Click **E** to close the **Report**.

Examples of reports

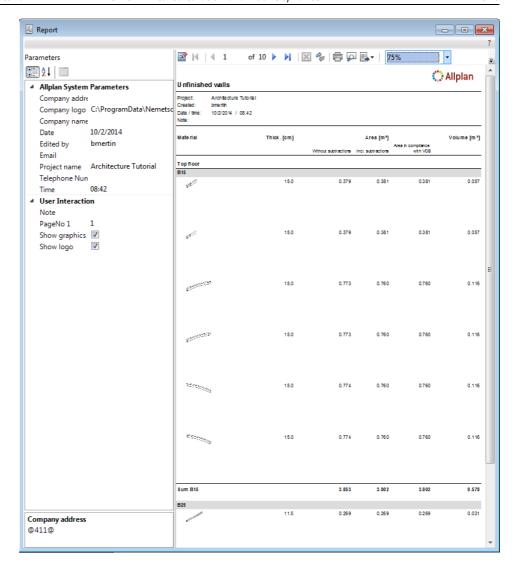
Below are some examples of reports to illustrate possible applications. These reports were created for the top floor of the tutorial building. Additional search criteria were not specified.

The unfinished structure reports also analyze area and volume to be subtracted in compliance with building regulations. You can control the graphical appearance of the report in the User Interaction area: for example, you can show and hide the component graphics or the logo.

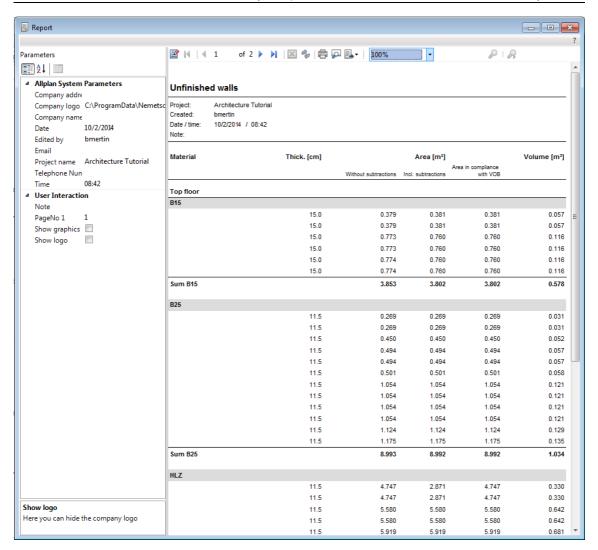


Tip: For quantity takeoff operations, you can transfer the quantities to a program for tendering, awarding and invoicing.

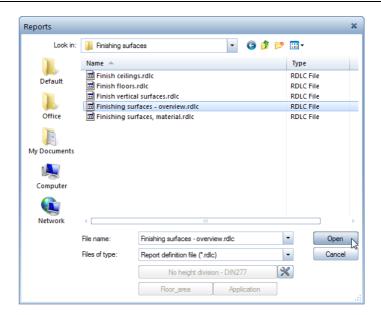
When assigning materials, you should therefore use material catalogs with item numbers.



The same report without the logo and graphics:

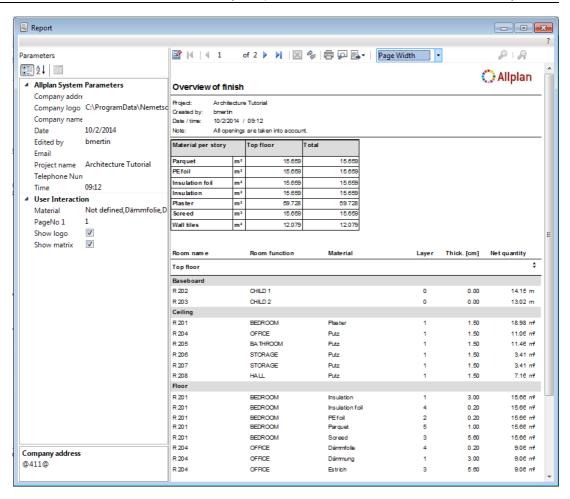


You can use the finish reports to analyze finish specifications in different ways. Try it out for yourself and generate a report for the finish in the bathroom. In this case, you do not need to open and select everything – just select the bathroom (enclose it in a selection rectangle or click the room). The following illustration shows the Finishing surfaces, overview.rdlc report (Default folder, Finish folder, Finishing surfaces subfolder). The layer you assigned to the rooms must be visible and modifiable.



Tip: The values entered for reveals are also taken into account.

Requirement: the reveal needs to have been defined when the window openings were entered.



Using the same approach, you can generate lists based on the trade assigned to the various elements in your model. Naturally, this will only work when the elements have actually been assigned a trade.

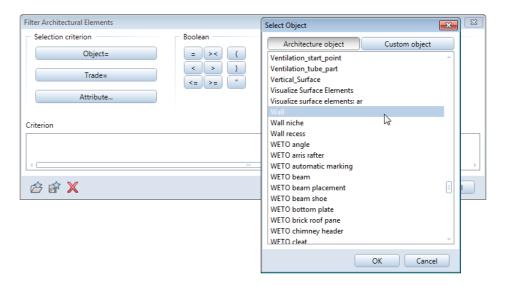
Entering search criteria

Using search criteria, you can analyze the building in many different ways. To analyze the entire building, all the relevant drawing files need to be activated.

Based on the report for the Unfinished structure - Walls, we will define a search criterion. We will list only walls that are 11.5 cm thick.

To enter search criteria

- 1 Click Reports (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area), select the Walls.rdlc report (Default folder, Unfinished structure folder) and click Open to confirm.
- 2 Click Find Elements in the input options.
- 3 Click **Object** and in the dialog box that appears, select the object you want to find: Wall. Click **OK** to confirm.

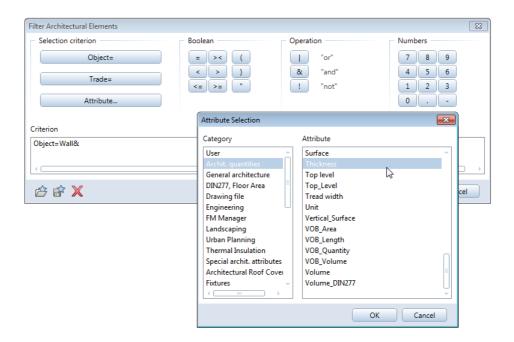


You can use Boolean operators to link your search criteria.

4 Click & "and" (logical AND).

The second criterion in this case is an attribute of the wall object - its thickness.

5 Click Attribute... and in the Archit. quantities category, select the Thickness attribute. Click OK to confirm.

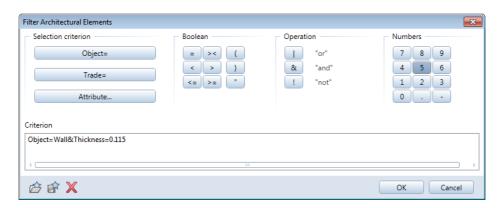


6 Select the comparison criterion =.

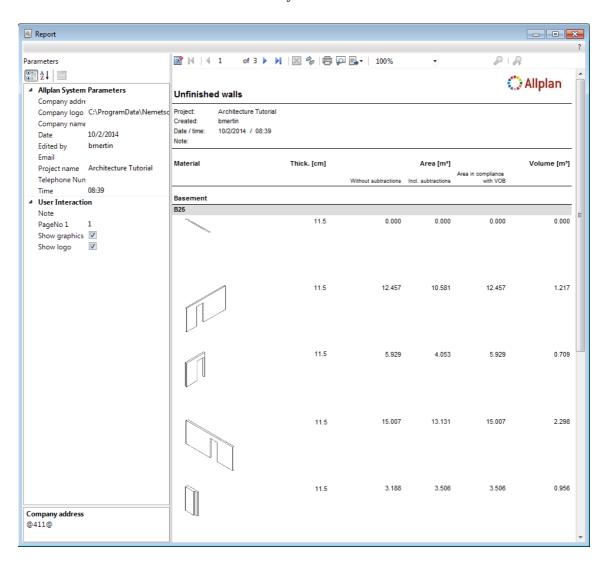
Tip: You can use X to undo the entries in the Criterion line one by one. 7 Enter the value for the thickness in the Numbers area: 0.115.

Just click the numbers you need.

The search criterion should now look like this:



- 8 Click **OK** to confirm.
- 9 Click All in the input options or click twice with the right mouse button in the workspace (do not double-click!!). The report now includes only those walls that match the criterion.



10 Click **to close the Report.**

Building lists

Building lists allow you to perform analyses in the reports with which you are already familiar. They can be created using the Building lists... function (File menu) or as Derivations from the Building structure.

Regardless of the option you choose, the steps for creating the report are very similar. You select the drawing files in a tree structure and assemble the data for the building list. Next, you specify which components of the building list are to be analyzed and start the operation.

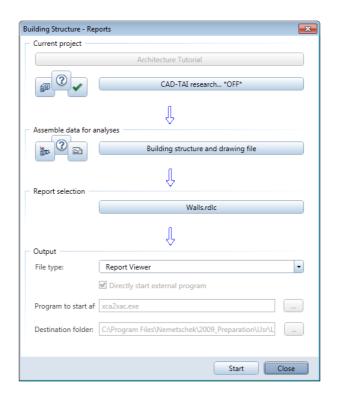
With **building lists**, the entire contents of drawing files are always selected. Only the visible layers, however, are analyzed. It is therefore necessary to select the layers to be analyzed beforehand. You can also perform searches according to specific criteria here.

The sections that follow describe the two options.

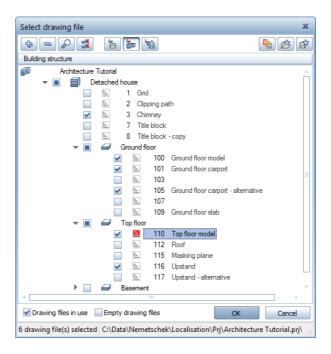
Building Lists tool (File menu)

To create a building list using the Building List tool (File menu)

1 On the File menu, click Building Lists....

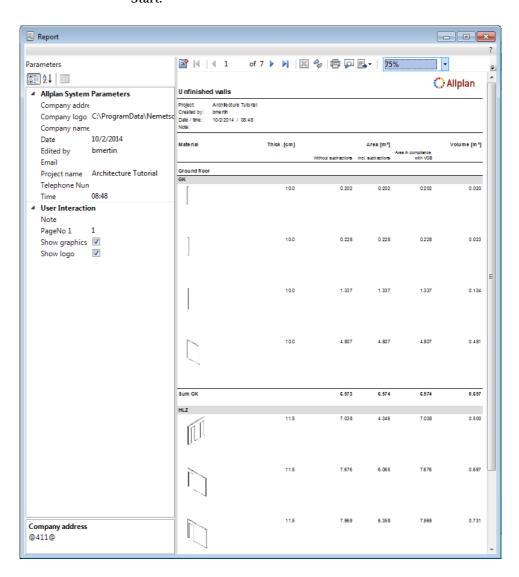


2 Click Building structure and drawing file.



- 3 Select the following drawing files: 3 Chimney; 100 Ground floor model; 101 Ground floor carport; 109 Ground floor slab; 110 Top floor model; 112 Roof; 116 Upstand
- 4 Click OK to confirm.
- 5 Click the button in the Report selection area.
- 6 Select the **Default** folder, the **Unfinished structure** folder and the **Walls.rdlc** file. Then click **OK** to confirm.

7 In the Output area, select the Report Viewer option and click Start.

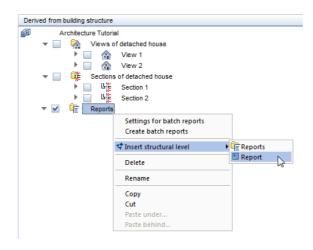


8 Click **to close the Report.**

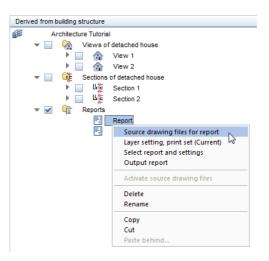
Building lists derived from the building structure

To create a building list which is derived from the building structure

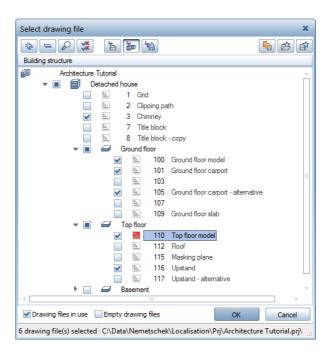
- 1 Select Den on a Project-Specific Basis.
- 2 On the right-hand side under Derived from building structure, open the shortcut menu of Reports.



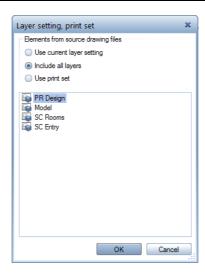
4 Open the shortcut menu of Report and select Source drawing files for report.



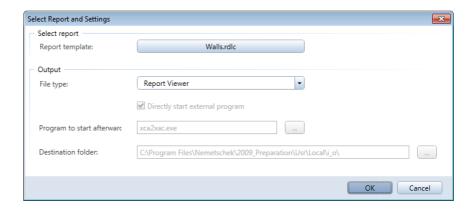
5 Select the following drawing files: 3 Chimney; 100 Ground floor model; 101 Ground floor carport; 109 Ground floor slab; 110 Top floor model; 112 Roof; 116 Upstand



- 6 Click OK to confirm.
- 7 Open the shortcut menu of Report again and select Layer setting, print set.
 - Select the Include all layers option.

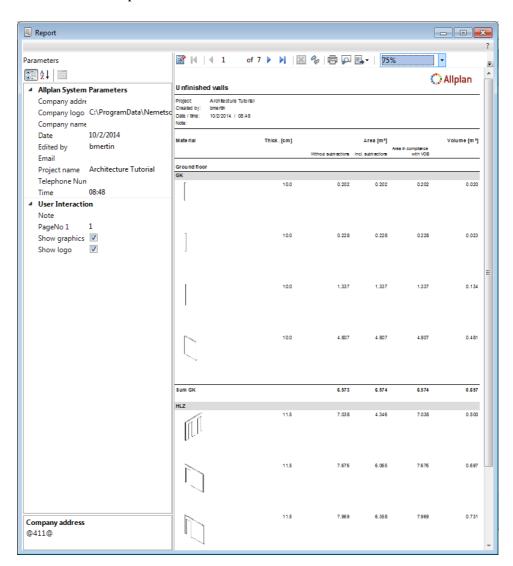


8 Open the shortcut menu of Report again and click Select report and settings.



- 9 Click the button in the Report selection area.
- 10 Select the **Default** folder, the **Unfinished structure** folder and the **Walls.rdlc** file. Then click **OK** to confirm.
- 11 In the Output area, select Report Viewer.
- 12 Click OK to confirm.

13 Open the shortcut menu of Report again and select Output report.



- 14 Click to close the Report.
- 15 The Open on a project-specific basis: drawing files from file-set/building structure dialog box is still open.
 Enter a name for the report you just created, for example, Walls.

Unit 8: Layouts

Before you start, you need to set up the printer.

Using Allplan 2015 you can quickly print out the contents of the screen on a printer.

To bring the final drawing to paper, all the filesets and drawing files are arranged in a layout.

Requirements for printing

Before you print, the output device needs to be configured correctly. If you are working on a network, you can use any device connected to a remote machine (assuming it is configured correctly).

To do this, you first need to connect the output device.

For more detailed information, please consult your printer's user guide or the documentation of the operating system.

Printing the screen contents

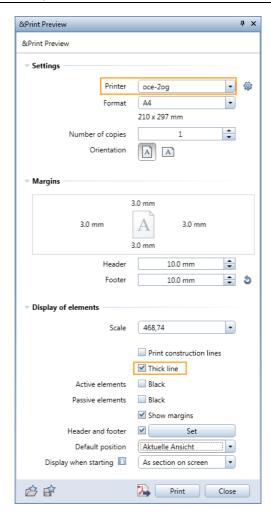
Often, it is convenient to have the current edit status on paper without having to assemble a layout first. You can do this by printing the screen contents.

To print the screen contents

- ⇒ Drawing file 110 Top floor model is current. Make the layers AR_WALL and DL_100 visible and hide all the other layers.
- 1 Click Print Preview (Default toolbar).
- 2 Make the following settings in the Print Preview palette:
 - Select the printer in the Settings area.
 - In the Display of elements area, select the Thick line option. This not only makes the different line weights visible on screen but also ensures that they are printed as such.

Tip: To create more printouts, click Quick Print on the File menu.

Without prompting you again, Allplan prints the screen contents using the most recent settings.



- 3 Click 🤾 Zoom All on the viewport toolbar.
- 4 Click Print.
- 5 Press ESC to close print preview.

Exercise 13: Custom Title Block

Allplan 2015 provides a wide range of "intelligent" title blocks based on label styles. Label styles contain design entities, text and attributes.

The advantage of a title block with attributes is that the text will update whenever you open the layout.

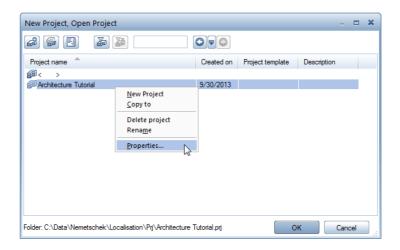
You can define your own, custom label styles.

Note: You have already drawn a title block in exercise 5 of the Basics Tutorial and saved it as a symbol with the name **Original** in the **Title blocks** library file. Now you will use this title block for the exercise that follows.

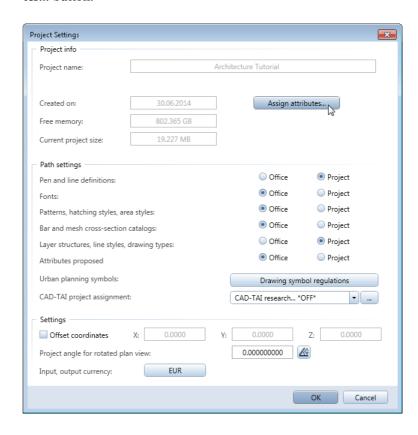
If you have not created this title block, you can find it in drawing file 7 in the project template for the training project. Look in the appendix for information on how to download the project templates from the Internet: Project templates on the Internet (on page 476).

To assign attributes

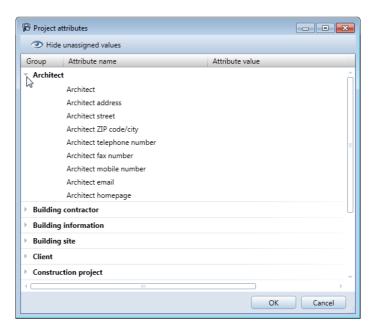
- 1 On the File menu, click Pow Project, Open Project.
- 2 Open the shortcut menu of the Architecture Tutorial project and click Properties....



3 The Project Settings dialog box opens. Click the Assign attributes... button.



4 In the Project Attributes dialog box expand the Architect node.

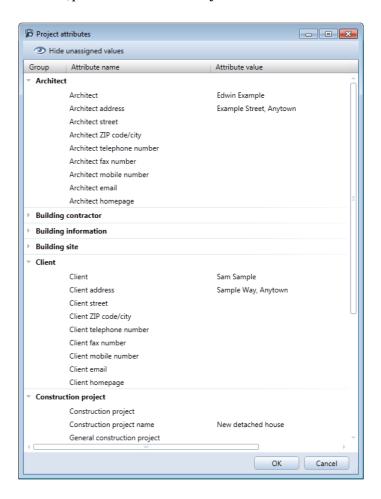


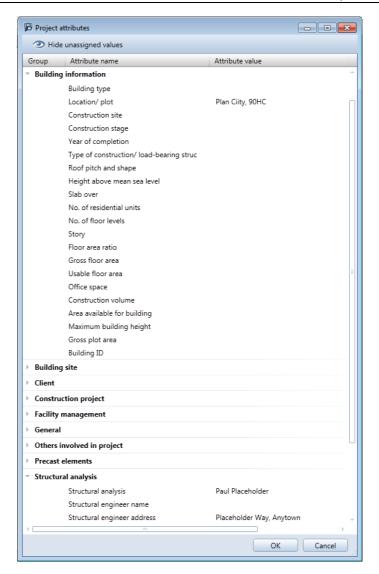
- 5 Click the Architect attribute.
- 6 Type in the following:

Sam Sample

7 Press ENTER to finish.

8 Define the Client, Client address, Construction project name, Location/plot and Structural analysis attributes as shown:





9 Click OK to confirm the Project Attributes, Project Settings and New Project, Open Project dialog boxes.

Title block as a label style

The attributes you just assigned will now be used in the label style for the title block.

This exercise assumes that the title block created in exercise 5 of the Basics Tutorial is available to you. You have already drawn this title block and saved it as a symbol with the name **Original** in the Title **blocks** library file.

Note: If you have downloaded the project template for the training project from the Internet, you will find the title block in drawing file 7 of the project template. Copy the contents of this drawing file to an empty drawing file (e.g. 10) of the Tutorial Project. Select the drawing file with the title block (e.g. 10) and start with step 7. Look in the appendix for information on how to download the project templates from the Internet: Project templates on the Internet (on page 476).

To create the title block as a label style

- → The title block named Original you created in the Basics Tutorial is available.
- Open an empty drawing file and close all the others.
- **⊃** Set the scale to 1:1.
- 1 Click the **Symbols** folder in the **Library** palette.
- 2 Open the **Office** folder.
- 3 Open the Title blocks folder.

Tip: To position the label styles quickly and accurately at a later stage, you can place Point Symbols as construction lines to mark the beginning of the original text to be deleted (Draft module, Create area).



4 Double-click the Original symbol with the left mouse button.

The symbol is attached to the crosshairs at its base point.

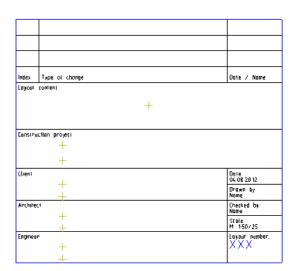
- 5 To place the symbol, click in the workspace.
- 6 If the title block appears too small, click **X** Zoom All in the border of the viewport.

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.

7 Delete the text that is to be replaced by attributes (project-specific information).

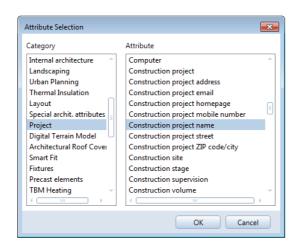
Index	Type al change	Dote / Name		
Layaul content				
loyout name+				
Lonstruction project name Location/ plot				
(lient	_flient	Date 04 08 20 12		
	Client address	Drown by Nome		
Archilec		Checked by: Name		
	Annie de antidos de la composición del composición de la composición de la composición de la composición del composición de la composición	Stole: N_ 150/25		
Engineer		Loyoul number.		



- 8 Click **E** Label Style (Tools palette, Architecture family, Rooms, Surfaces, Stories module, Create area).
- 9 On the context toolbar, click Attribute.



10 Select the Project category, choose the Construction project name attribute and click **OK** to confirm.



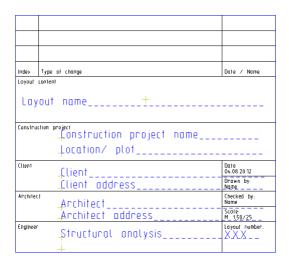
11 Set the text parameters as shown below and change the format: A35.

This defines the attribute as a text item with 35 characters maximum.



- 12 Set the attribute so that it is left-aligned in the box for the construction project details.
- 13 Repeat steps 7 through 10 and place the following attributes:

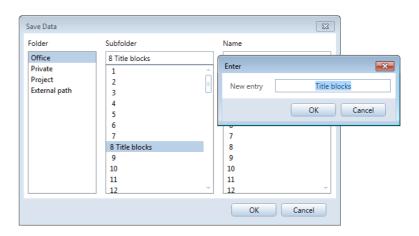
Category	Attribute	Format
Project	Construction project name	A35
	Location/plot	A35
	Client	A35
	Client address	A35
	Architect	A35
	Architect address	A35
	Structural analysis	A35
Layout	Layout name	A50



- 14 Click DefFol (Define Foil).
- 15 Using the left mouse button, enclose the entire title block in a selection rectangle.
- 16 Click the point at bottom right. This will serve as the reference point.

Title blocks must always be saved in the subfolders 7 and 8, as these subfolders are associated with the Label tool in the Layout module.

17 Click subfolder number 8 and enter Title blocks.



- 18 Click entry 1 and enter Unfinished structure.
- 19 Press ESC to quit the tool.

 The title block is now saved as a label style.

You can also find the **E** Label Style tool in the following modules:



Object Manager



Smart Symbols



Landscaping



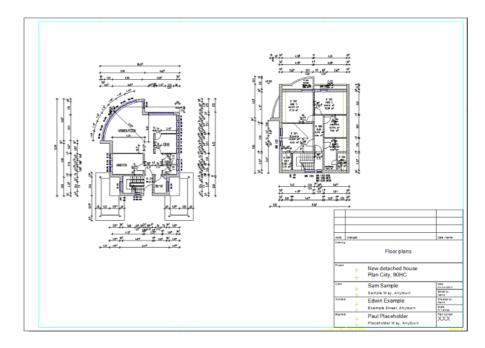
Urban Planning

Layouts

Printing finished layouts is a critical step. In Allplan 2015 a layout is the unit you send to the printer. As opposed to design using a conventional drafting board, the scope of the layout does not have to be defined in advance.

Generally, you leave the layout (which involves arranging and laying out drawing files and/or filesets) until you're finished with the design. This is also the stage where you define the paper size, scale, border, angle, and so on.

Each project can contain up to 9,999 layouts.



Assembling layouts

In the following exercises you will set up a layout with the floor plans of the ground and top floors of the sample building. This involves two steps:

- Defining the layout, that is, the sheet size, border and label (title block).
- Selecting the layouts elements, that is, the filesets and drawing files.

To set up a layout

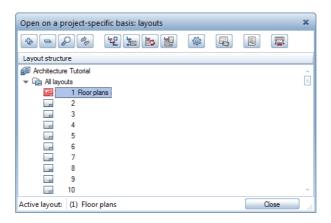
Switch to the layout editor.

To do this, click Layout Editor on the Default toolbar or File menu. The icon remains pressed in until you quit the layout editor again and switch back to document edit mode.

The Layout module opens automatically.

1 Click Open on a Project-Specific Basis (Default toolbar) to select the layout in the Open on a project-specific basis: layouts dialog box.

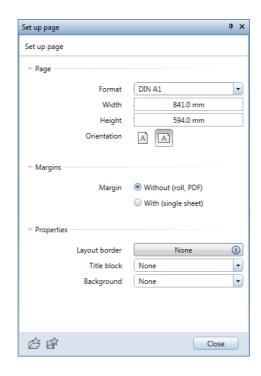
Tip: The name you enter here will appear as the Plan name attribute in the title block!



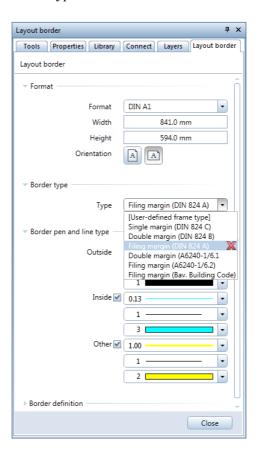
- 2 Click in row 1, enter Floor plans and close the dialog box.
- 3 Click Set Up Page (Tools palette, Basic family, Layout module, Create area).

Using the setting you make for the margins, Allplan always places the page so that its bottom left corner coincides with the bottom left corner of the printable area of the printer you have specified in the Print Layouts tool. This way, you can make sure that elements in the margins of the page are not included in the printout.

- 5 In the Properties area, click the button beside Layout border.



6 In the Border type area, select Filing margin (DIN 824 A) for the border type.



7 Click Close at the bottom of the palette.

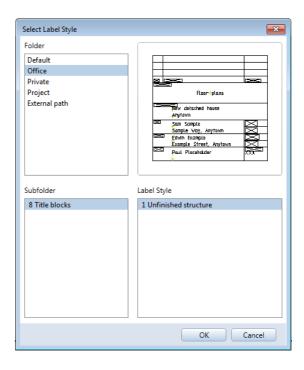


8 In the Properties area, click the button beside Title block and choose Label.

Tip: To change the annotation for the layout, switch to the **Text** module and use the standard text editing tools.



9 In the Office folder, select the label style called Structure and click OK to confirm.



10 If you want to place the title block in the bottom right corner of the layout border, enter 0 for Offset to the right and Offset to the bottom.



11 Quit the Set Up Page tool by clicking Close at the bottom of the palette.

Now you have placed the layout border and the title block.

If you look at the title block, you can see the values assigned instead of the attributes.

Index	Type of change	Date / Name			
Layout	Layout content				
Floor + plans					
Construction project New detached house _Anytown					
Client	Şam Sample	Do1e 04.08.2012			
	Sample Way, Anytown	Drown by: Nome			
Anchited	' Edwin Example	Checked by: Name			
	Example Street, Anytown	Scole: M 1.50/25			
Engineer	Paul Placeholder	Loyout number.			
	+				

Selecting layout elements

Layout elements are mainly drawing files that you place in the layout. You can specify which layers are to be included in the printout by selecting a print set.

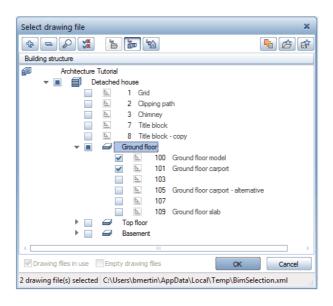
Allplan 2015

To select layout elements

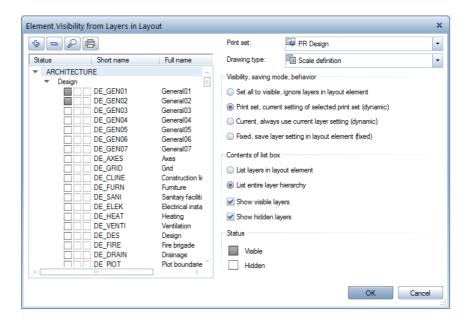
1 Click Layout Element (Tools palette, Basic family, Layout module, Create area).



- 2 On the context toolbar, click **Building structure**.
- 3 Select drawing files 100 Ground floor, model and 101 Ground floor, carport and click OK to close the dialog box.



4 In the Layout Element dialog box, click Layer/print set, select the Print set, current setting of selected print set option and select the PR Design print set.



- 5 Place the drawing files in the layout.
 - Drawing file 105 is now attached to the crosshairs. This drawing file is not required.
- 6 Click Building structure and select the drawing file 110 Top floor model
 - The PR Design print set remains active.
- 7 Place the drawing file in the layout.
- 8 Press ESC to finish selecting layout elements.

The finished layouts are saved and can be printed now or later.

Printing layouts

You can now print the finished layout.

Before starting, check that the printer is correctly installed and configured.

To print the layout

- 1 Click Print Layouts (Tools palette, Basic family, Layout module, Create area).
- 2 Select the Printer tab.

In the Selection area, layout 1 is selected.

Click the **Set** button to select the elements you want to print. You can limit the output to certain types of design elements only. Furthermore, you can place the surface elements of each document in the background.

Leave the settings as they are.

3 In the Settings area, you can choose the output device (printer/large format printer) and the paper size (for example, ISO A0). So that the layout is printed in its entirety, the printable area (printable area minus device margins) must be larger than the page.

Note: If you have configured output channels in the Services application, you can select them using the Allplan vector drivers option.

4 Depending on the selected output device, you can use Allplan raster drivers. These printer drivers are especially suitable for printing large-format layouts. Raster drivers speed up printing, improve the quality of printouts and are very reliable. If you want to use raster drivers, select the Allplan raster driver option and open the list box to select a raster driver that can be used in conjunction with the selected printer.

Note: You can define the properties of the Allplan raster driver by clicking beside the selected printer.

Note: The first time you select an output device that can be used in conjunction with Allplan raster drivers, the following prompt will appear:



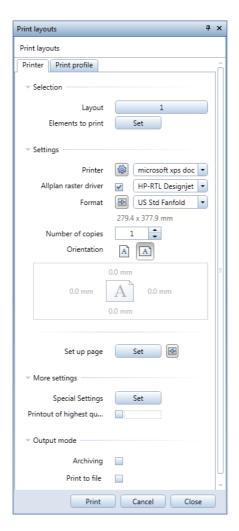
If you want to use Allplan raster drivers, click Yes. You have selected the Allplan raster driver option and chosen an appropriate raster driver.

Note: If the When setting up page - adjust paper format (printer) option is selected (Options, Layouts page) and you are setting up the page, Allplan automatically adjusts the paper format of the device to the format and orientation of the page by selecting as identical a paper format as possible. If you have not defined margins for the page, the program tries to select a format without margins. If formats of this kind are not available, the next largest paper format is selected. If a suitable format cannot be found, the largest available format of the output device is selected.

If this option is not selected, click Select paper format (printer) based on page format to manually match the format and the orientation of the page.

5 Select the Landscape format and do not change the number of copies: 1.

You can also set up the page here.



- 6 Make settings in the **Output mode** area. If you want to bring the layout to paper, select the **Print** option.
- 7 To start printing, click **Start**.

This prints the layout.

Note: You can find more information on the tabs of the Print Layouts tool in the Allplan help.

Layout windows

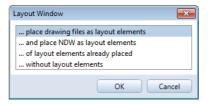
You can use layout windows to position just portions of drawings in your layout. Elements that are far from one another in the building model can thus be displayed beside each other in the layout. In the following exercise you will create layout windows and display sections of individual drawing files.

To create layout windows

- Open an empty layout using Open on a Project-Specific Basis and specify the format, orientation and margins of the page using Set Up Page.
- 2 Click Layout Window (Tools palette, Basic family, Layout module, Create area).

You will create the window so that you can immediately select the drawing file you want to display.

3 Click .. place drawing files as layout elements.

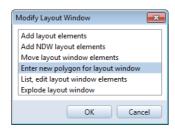


- 4 On the context toolbar, click Building structure, select drawing file 100 Ground floor model (drawing file number) and place it in the layout.
- 5 Press ESC as you do not want to select more drawing files for this layout window.

Tip: Using the polyline entry tools, you can also define freeform layout windows or create layout windows composed of several individual polygons.

Check that Area detection is switched off in the input options.

- 6 Define the size of the layout window by entering two diagonally opposite points (bottom left and top right) with the left mouse button and pressing ESC twice (see below).
- 7 Repeat steps 2 through 6 to create a layout window for drawing file 110 Top floor model.
 - If available, you can also use the drawing files with the West elevation and North elevation.
- 8 Click Modify Layout Window (Tools palette, Basic family, Layout module, Change area) and select Enter new polygon for layout window to change the size of the window later.

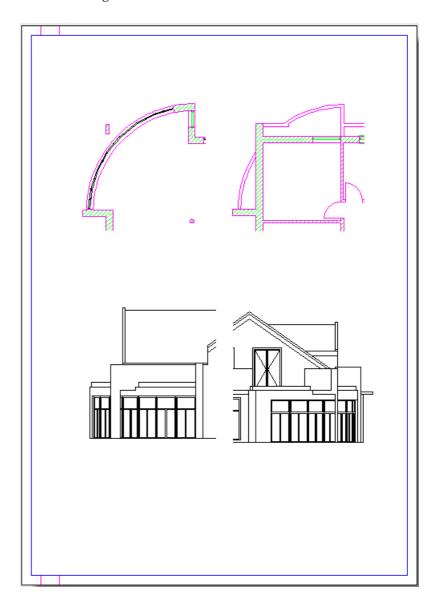


Tip: Using Show/Hide you can hide the borders of layout elements and layout windows.

9 To change the arrangement of the layout windows, you can use Move (Edit toolbar).

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The result might look like this:



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Unit 9: Presentation

The exercises in this unit require the Animation module.

Check in Palette to see whether you have licensed this module.

The ability to make presentation drawings - be it for clients or for competitions - is important.

Allplan thus comes with powerful presentation modules. These include tools for simple hidden-line images to real-time walk-throughs.

You can create a realistic, three-dimensional image of your design at any time during the design process – with colored surfaces, lighting, and shadows. This unit shows you how.

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The Presentation family

Allplan 2015 includes comfortable and powerful modules for presenting building models and interiors. Now you will work with the **Animation** module; the other modules in the **Presentation** family are introduced briefly.

The Paint Module

You can use the tools in the Paint module to create and edit colors, colored areas and color freehand lines. All elements created in this module are saved in vector format which means that the elements can be moved, mirrored, resized, enlarged etc. without loss of picture quality. You can also apply a specific hue to color images in a single operation.

You work with 256 predefined colors. Alternatively, you can mix your own colors using red/green/blue values or based on hue/saturation/brightness.

Besides the Allplan standard color palette, you can purchase additional color sets (RAL 840 HR, RAL Design System, for example) or assemble your own RGB color palettes.

The Shadow Module

The Shadow module provides tools for generating full-surface, color representations of 3D models including shadows cast by two light sources. Natural daylight can also be taken into account by specifying a latitude, date and time. This way, you can study the effects of light and shadow on a building during the course of a day.

Furthermore, you can make photo-realistic images of building models created using the modules in the Architecture family or using the tools in 3D Modeling. The program calculates photos based on the perspective view that you set. You can also study the effect of sunlight on a building over a period of time.

As opposed to the Animation module where the images are bitmaps (based on pixels), the elements you create in the Shadow module are saved in vector format which means that the elements can be moved, mirrored, resized, enlarged etc. without loss of picture quality.

The Animation module

In animation, you can shade (from a palette of up to 16 million colors) the walls, windows, 3D lines and so on you created in the 3D and architectural modules.

Using Set Light for Project, you can set any number of colored light sources of varying intensity which allow you to create realistic scenes. Using Set Surface, you can assign surface properties to the architectural and 3D elements. You can use textures, such as wood, marble, stone, sand and so on, supplied with the program or bitmap images such as scans of tile structures for material simulations.

In order to view the object in its real surroundings or to achieve other visual effects, you can place a bitmap (see "Bitmaps and vector graphics - definition of terms and differences" on page 394) (for example, a scanned photograph) as a texture in the background. You can then display this background bitmap as a 2D plane or a 3D sphere.

Using Render, you can render images based on Global Illumination (with/without QMC) to produce photo-realistic images for presentations.

Using Set Camera Path, you can match camera positions intuitively from the viewport. You can also define a camera path in plan view or enter the coordinates of the cameras. Using Record Movie, you can record the camera path as an AVI movie, which you can then play back on any Windows computer. You can save the bitmaps (see "Bitmaps and vector graphics - definition of terms and differences" on page 394) calculated and use them for presentations.

Predefined camera paths, such as Rotate camera by 360 degrees and Orbit camera by 360 degrees as well as Sun study produce meaningful results in no time at all.

When recording movies, you can choose between the Animation (quick, Flat-Shading, Gouraud or Phong method) and Render (realistic, Global Illumination method) settings.

So you can quickly and easily check each design stage or construction stage and create convincing presentations. If you do not want to display the entire 3D model in animation, you can select individual components using Element Selection. You can even display only a single design entity in animation. Until now you have used

394 The Presentation family Allplan 2015

the modules in the Basic and Architecture families to design your building model. In these modules, bitmap data are created and processed whereas the **Animation** module works with data in vector format.

Bitmaps and vector graphics - definition of terms and differences

The Paint and Shadow modules create and process data in an entirely different manner to the Animation module. The Animation module uses pixel graphics while the Paint and Shadow modules work with vector graphics. At first glance, the result may often be the same - however, the differences between these two forms of data processing are significant.

Terms: vector data

CAD systems that aim to produce precise drawings work with geometry-oriented CAD data. The elements in a CAD drawing are saved as vectors. These vectors serve to define the elements and allow them to be identified as such.

A straight line, for example, is defined by its start point, end point and the direction; a circle consists of a center point, a radius and an angle. Complex geometric entities such as splines are approximates using mathematical formulas.

A CAD drawing thus consists of a series of geometric values entered via the keyboard or using the mouse. These values are exact values and are based on the defined coordinate system.

Vector data are "intelligent": When you resize vectors or zoom in on details, the vectors themselves are still mathematically precise. The representation adapts to the different scales and sizes which is why there is no loss of quality even when vectors are printed out as large-format drawings.

Terms: bitmaps

Bitmaps consist of a series of picture elements (hence the term pixel). Information on the position and color of every pixel within a dot grid is stored.

Together, the pixels form an image somewhat similar to a photograph in a newspaper (these are also merely a series of dots). The nearer you are to the image, the more visible the individual dots. The finer the grid of dots, the better the resolution.

When you render an image in the Animation module, you cannot enlarge it without suffering loss of quality. This is because only the pixels themselves are enlarged thus leading to deterioration in the quality of the picture - even with small pictures: The image appears coarse, sloping lines look like steps and even smooth transitions from one color to another increase in contrast.

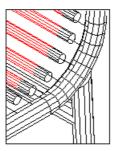
In the Animation module, you can render images using different resolutions. The higher the resolution of the image, the better the quality. However, the amount of data generated also increases significantly and the operation can take much longer as a result. When rendering an image, keep the printout format in mind and set an appropriate resolution.

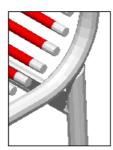
Vector data and pixel images in Allplan

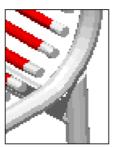
Elements that you create in Allplan are generally saved as vector data; the exception is the images you generate in the Animation module.

The following modules generate the following types of data:

- Paint and Shadow modules: vector data no loss of quality + pictures can be manipulated at will.
- Animation module: pixel data.
- Scan module: hybrid data processing (i.e. both). This means that you can resize, move the bitmap data in a scanned image as if the data were vector data. The scanned image's bitmap data behave like vector data. However, with high factor enlargements, the Aliasing will become more evident.







Exercise 14: Animating the Building Model

Real-time animation is only *real* time if you have a computer that is powerful enough to perform the complex calculations.

To demonstrate more clearly the effects that can be achieved in this module and to shorten processing time, the following exercises will use just the walls in the ground floor. You can follow this procedure with the entire building model.

How to work with animation

The following shows how to create a movie model in just five steps. You will learn about the basic tools in the Animation module.

Please bear in mind that making complex animations using sophisticated effects requires practice and experimentation. You should therefore consider the following as an introduction and try to spend some time exploring the different possibilities.

Procedure:

- Set the animation parameters and define the first scene
- Set up the lighting (sun)
- Define materials and surface properties
- Choose a rendering method and render the image
- Assemble the movie model: position cameras

Animation window

In a viewport with the Animation view type, you can use the mouse to define the direction from which you look at the object. You can also see lights, surfaces and shadows (depends on the graphics card).

To open an animation window and set parameters

- **○** Make drawing file 100 Ground floor model current and set 101 Ground floor carport to edit mode.
- → Make the layers AR_WALL and AR_COL visible and hide all the other layers.
- **⊃** In the Tools palette, select the **≦** Animation module (Presentation family).

Note: To learn more about the animation tools, work through the "Presentation" step-by-step guide. Serviceplus customers can download this guide as a PDF file from www.allplan-connect.com.

- 1 You have various options to display the design in animation:
 - The quickest way is to press the F4 key. Allplan opens an additional viewport with the Animation view type. You can see the building in the middle of the animation window. The view is from the front and top. In addition, Allplan selects the Perspective view option in 3D View and switches to Navigation Mode (viewport toolbar).
 - Select Animation Window on the Window menu or on the shortcut menu of the viewport. Here, too, Allplan opens an additional viewport with the Animation view type. You can see the building in the middle of the animation window. The view is from the front and top. In addition, Allplan selects the Perspective view option in View and switches to Navigation Mode (viewport toolbar).
 - Click View Type at bottom right on the viewport toolbar and select Animation. The program displays the design in the current viewport in animation.
 Here, Allplan does neither select the Perspective view option

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> in 🍑 3D View nor switch to 🚨 Navigation Mode (viewport toolbar).



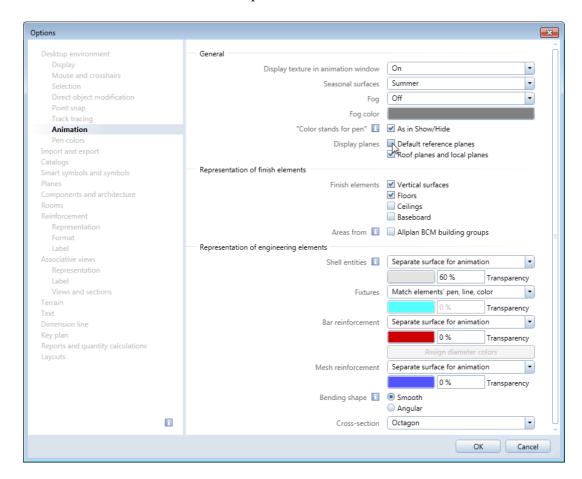
Note: If the cursor in the animation window looks like this \$\infty\$, Navigation Mode (viewport toolbar) is active.

2 You have opened an animation window by pressing F4, for exa-

The default reference planes and a virtual ground plane are visible in the animation window. Next you will hide the default reference planes, as you do not need them for the following exercises.

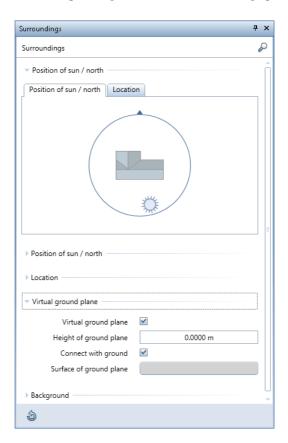
On the Default toolbar, click X Options.

3 Open the Animation page and clear the Display planes - Default reference planes check box in the General area.



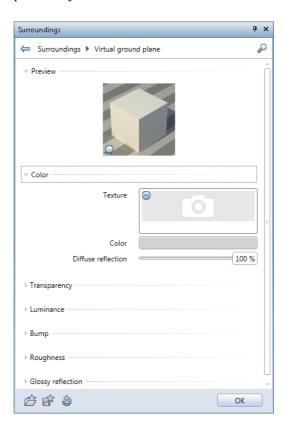
4 You can find the settings for the virtual ground plane in the Surroundings tool. This tool is in the Change area of the Animation module (Tools palette, Presentation family). You can also find it on the shortcut menu of the animation window. Select this tool.

5 As you can see, the Virtual ground plane option is selected in the corresponding area in the Surroundings palette.



The Connect with ground option is also selected by default. In this case, the virtual ground plane will automatically adjust to the bottom of the elements. For example, if you open drawing file 3 Chimney in addition to the other drawing files, Allplan will move the virtual ground plane below the bottom level of the chimney.

6 If you want, you can customize the surface of the virtual ground plane for your needs. Click the button and make settings.



- 7 Click **OK** to close the palette.
- 8 Quit the Surroundings tool.

Once you have defined the options of the animation window, you can use the mouse to walk around and through the building in the animation window. Before you start, check that Navigation Mode (viewport toolbar) is active (= cursor looks like this).

Animation using the mouse

Tip: Pressing and holding down the SHIFT key accelerates the movement of the mouse.

- 1 Navigate by pressing one of the following mouse buttons and gently moving the mouse:
 - Left: turns the camera about an object on the surface of an imaginary sphere.
 - Middle: moves the camera to the left/right and up/down on a linear path.
 - Right: "zooms"; moves the camera forward and backward.
- 2 Quit animation by closing the viewport or selecting the Wireframe view type on the viewport toolbar.

Mouse movement in sphere mode and camera mode

The default setting is sphere mode. In this mode, the eye point pivots about the target point and its movement is constrained to an imaginary sphere. You have already encountered the movement of the mouse in sphere mode. This topic was dealt with in the unit called "Building Design":

Mouse navigation in sphere mode

Left mouse button pressed and held down:

Turns camera about object on the surface of an imaginary sphere

Middle mouse button pressed and held down:
Moves camera laterally/up/down (camera movement)

Right mouse button pressed and held down:
Moves camera towards/away from object (zooming)

If you keep the CTRL key pressed down while in animation mode, you switch to Camera Mode. This mode can be visualized as the view through a camera with the observer at the center, 'looking' around.

Mouse navigation in camera mode

CTRL + left mouse button pressed and held down: "Camera pan" - this is rotation about the viewer

Middle mouse button pressed and held down:
Moves camera laterally/up/down (camera movement)

CTRL + right mouse button pressed and held down: Moves camera towards/away from object (zooming)

Exercise 15: lights and surfaces

Light

The choice and setup of appropriate lighting is an important factor if a presentation is to be a success. The program provides a wide range of lighting options:

- Sunlight: using Surroundings, you can make settings for sunlight by defining the position, time and angle of the North arrow in plan view. You can also add a fill-in light for interiors.
- Individual lights (particularly important for lighting interiors): use Set Light for Project to create these lights. For each light, you can define a color, the type of light source and the exact location of the light source and its target.
 - **Point light**: point light is diffused evenly in all directions from a single light.
 - **Spotlight**: the intensity of the light drops the further away from the point it is.
 - **Conical light:** is similar to the spotlight except that the intensity of the light pool cast is uniform.
 - Area: an area light source diffuses light evenly in one direction.

You can use the Sun Study tool to generate sun path studies quickly and easily,

In the following exercise, you will set the sunlight.

Tip: Click (at bottom left in the palette) to return to the default values.

To set up lights: sunlight

1 Click Surroundings (Tools palette, Presentation family, Animation module, Change area). You can also right-click in the animation window and select Surroundings on the shortcut menu.

2 In the Surroundings palette, make the following settings in the Position of sun / north area:

• Month: July

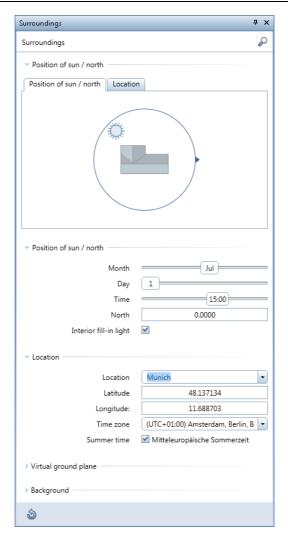
• Day: 1

• Time: 15:00

• North: **0** (on the side with the kitchen).

3 In the Location area, select a city in the list. You can add cities to the list: first enter the latitude and longitude. Then enter a name for the location.

4 Select the Summertime check box.



- 5 Press ESC to quit the Surroundings palette.
- 6 You can immediately see the effects of these settings in the animation window (if it is not open, select **Animation** on the viewport toolbar).

The shadows cast by the lights are not visible due to the rendering method employed here. The direction of lighting, however, is evident from the illumination of the surfaces. Note: Due to various factors (e.g. local time, time zone etc.), the calculated position of the sun might not exactly match the actual position in reality, even if you have defined the location and time parameters correctly. For further information and possible solutions, see the section entitled "Sun and Longitude, Notes" in the help for Allplan 2015.

Surfaces

Each line color can be assigned a surface color as well as a value for transparency, luster, refraction and a texture.

Defining colors

In Allplan, you have three options to define and mix colors. You can also combine these options.

- Click the color in the color circle and define its brightness using the slide bar.
- Mix the color in the following color spaces by entering values in the boxes:
 - RGB: red-green-blue color space
 - LAB: Lab color space
 - HSL: HSL color space (hue, saturation, lightness)
 - CMY: subtractive cyan-magenta-vellow color model
 - Hexadecimal: hexadecimal color definition; hexadecimal numbers represent the RGB color value in the sequence RRGGBB.
 - Select a color system, a color file and then a color name in the file. You can also define your own custom palettes.

Note: The Color stands for pen option, which can be switched on and off in Show/Hide, has no effect on the colors in animation; surface properties are always assigned based on 256 element colors.

We will now assign the walls a different color.

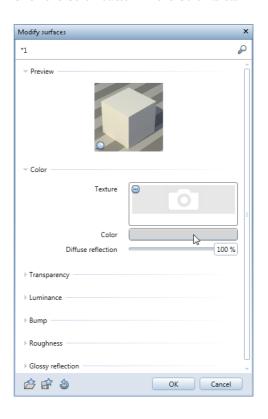
To define a wall surface

Tip: You can also define surfaces using the Set Surface tool (Tools palette, Presentation family, Animation module, Change area).

- The animation window is still open.
 If it isn't, press the F4 key.
 The walls have been drawn using color 1.
- 1 In the animation window, click one of walls with the right mouse button and select Set Surface on the shortcut menu.

The Modify Surfaces palette opens.

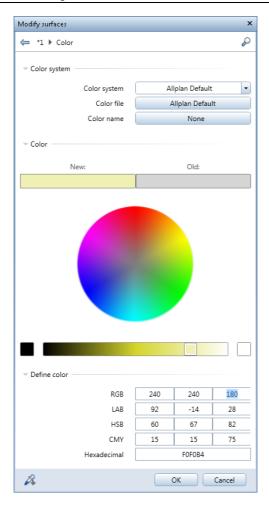
2 Click the Color button in the Color area.



Tip: You can save your own colors under a name of your choice. You can also save entire color palettes in color files.

3 Define a color using the RGB color space:

Red: 240 Green: 240 Blue: 180



4 Click OK twice to confirm all settings.

You can immediately see the effects of these settings in the animation window.

Changing the surface has an effect on all visible elements with the same color!

As an alternative to Set Surface, you can also use Assign Custom Surfaces to 3D, Archit. Elements on the shortcut menu of the animation window to assign animation surfaces to 3D elements, regardless of the element color.

Exercise 16: Rendering

The render tool will render your model, taking into account all the settings you have made for the view, lights and surfaces. You can choose from various rendering methods.

When rendering, Allplan always uses the most recent view you have set in the animation window. You should therefore never render straight from the viewport in which you design. Rather, set a suitable view in the animation window before you start rendering.

The following applies, whichever method you use: the more sophisticated the rendering method and the larger the rendering window, the longer the whole process will take.

The following exercise uses the global illumination method.

To render an image

⊃ In the animation window, set the view you want to render.

1 Press the F2 key.

Or:

Click Render (Tools palette, Presentation family, Animation module, Change area)

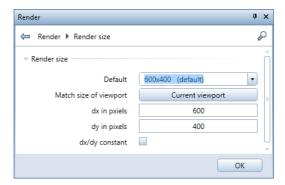
Or:

Click in the animation window with the right mouse button and select Render on the shortcut menu.

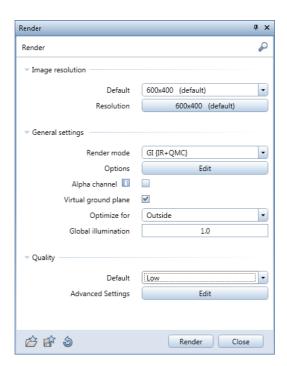
- 2 Now define the size of the image you want to generate. In the Render palette, go to the Image resolution area and click the Resolution button.
- 3 Open the list box and choose 600x400 (pixels). This will be sufficient for a first impression.

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4 Click OK to confirm.

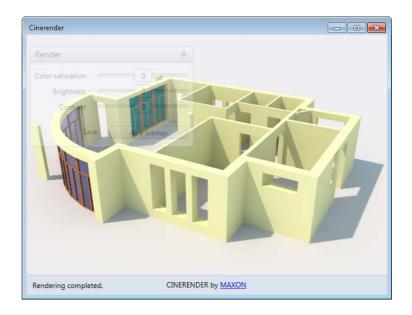


- 5 In the General Settings area, set the render mode to Global Illumination (GI (IR+QMC).
- 6 In the Quality area, set the Default to Low. Remember: the better the quality, the longer the whole process will take.

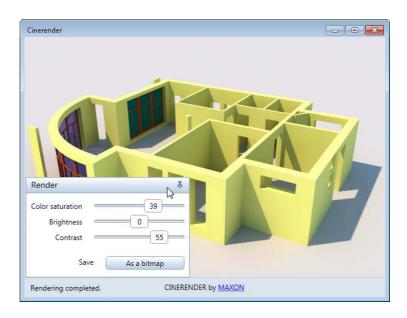


Tip: Once the program has finished rendering, you can save the image as a bitmap. You can then edit it using the Edit Bitmap tool. (For more information, please consult the F1 help.)

7 Start rendering by clicking the Render button.Allplan displays the result:



8 You can optimize the result using the settings in the Render dialog box.



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If you want, you can save the image as a bitmap to any folder.

9 Close the window with the result.



Exercise 17: Camera Path, Movie Model, AVI Movie

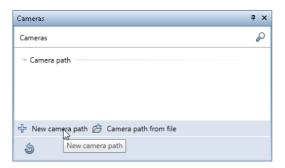
You will now simulate a fly-by around the ground floor.

To do this, you will set camera positions and save these together as a 'movie model'.

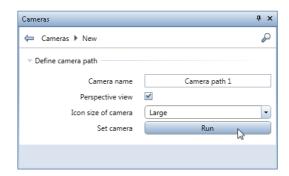
In the following exercise you will create a movie by positioning individual cameras in the floor plan.

To create a movie

- 1 Click Set Camera Path (Tools palette, Presentation family, Animation module, Change area) or click in the animation window with the right mouse button and select Set Camera Path on the shortcut menu.
- 2 Click New camera path at the bottom of the Cameras palette.



3 Click the Run button beside Set camera.



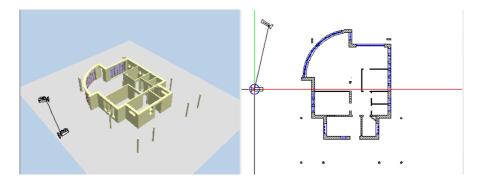
The first camera is attached to the crosshairs.

4 Place the camera in plan view.

You can rotate the camera freely.

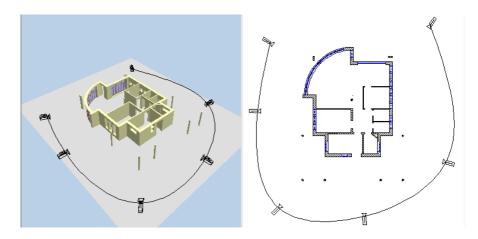
5 Click to turn the camera in the direction you need (defines the target point).

The program places the camera accordingly.



6 Position the next camera in the same way.

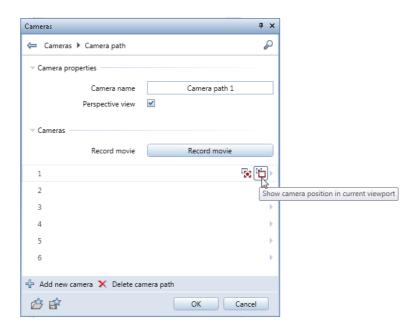
7 Place other cameras (see illustration) and press ESC to close the camera path.



The Cameras palette displays the camera path.

The Cameras area shows the cameras 1 to 6 you have just placed in plan.

8 In order to check and correct the camera positions, you can display them in the current viewport.
Select the camera you want to check and click the corresponding tool.



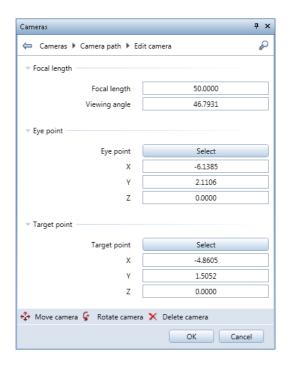
9 If you want to change the position of the camera, click the small arrow at the end of the line.

> Now the palette shows the parameters of the camera. You can change the focal length and the coordinates of the eye point and the target point.

> You can find more modification options at the bottom of the palette:

Move camera, Rotate camera and Notete camera.



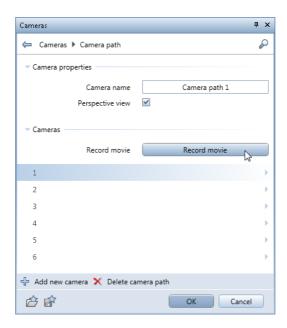


Tip: As you entered the camera positions in plan, the Z coordinates of the eye points and target points of all cameras are zero, that is, the cameras "lie" on the virtual ground plane. So that the observer can view the model realistically, enter a sensible height for the Z coordinates of the eye points and target points. For example, enter 1.65 m.

10 Click OK to confirm your changes.

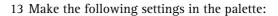
The Cameras palette displays the camera path again. Using the tools at the bottom of the palette, you can add cameras or delete the camera path.

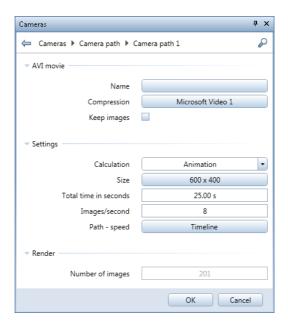
11 Click the Record movie button.



12 In order to get a first impression, you do not need to work with larges volumes of data.

Enter a name for the movie and specify the folder.





Note: Do not enter a Name for the AVI movie for the time being. Consequently, Allplan will play back the movie without saving it. So you can still change it before you save the final version.

- 14 Click **OK** to confirm the dialog box.
- 15 Click Yes to confirm the message.

 The movie runs as an animation in the current viewpoint.

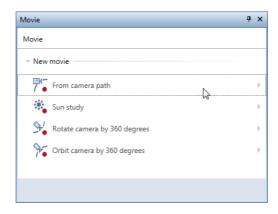
 This completes the Set Camera Path tool.

Recording an AVI movie

You will now record an AVI movie along the camera path you have just defined, taking into account the settings for lights and surfaces. Please note that this can take some time.

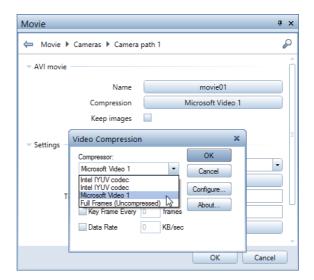
To record an AVI movie

- 1 Click Record Movie (Create area).
- 2 In the Movie palette, select From camera path.



- 3 Click Camera path 1.
- 4 Enter a Name for the movie and specify the folder. The project folder is the default setting.

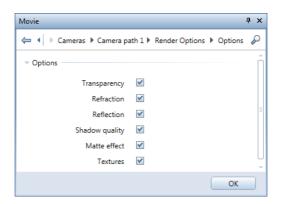
5 Select the Compression type or switch it off if you want to obtain top quality (requires a lot of disk space!). Click OK to confirm.



Note: You can choose from all Compression methods installed on your computer. Using Windows Media Player, you can automatically update codecs (compression/decompression). Further information is provided in the help of Windows Media Player.

- 6 In the Settings area, set Calculation to Render.
- 7 Define the **Render options** by clicking the **Edit** button.
- 8 In the General settings area, set the render mode to GI (IR+QMC).

9 You can define further settings for rendering by clicking the Edit button beside Options. Click OK to confirm.



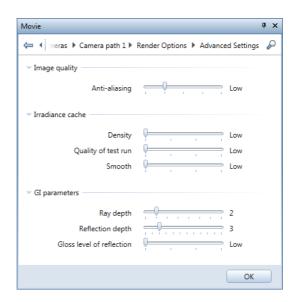
10 You can define the quality of the rendered images in the **Quality** area.

Set the default to Low.

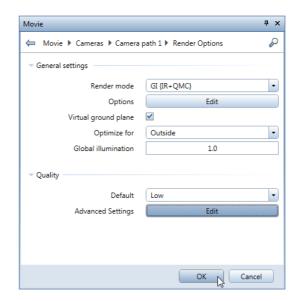
Remember: the better the quality, the longer the whole process will take.

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11 You can customize the quality settings by clicking the Edit button beside Advanced settings.
Click OK to confirm the settings.

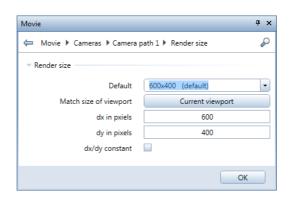


12 Click **OK** to confirm the **Render Options**.



13 Specify the Size (= size of window with the rendered image) by clicking the button.

Select a default setting of enter the width and height in pixels. You can also match the size of the current viewport. Click **OK** to confirm the render size.



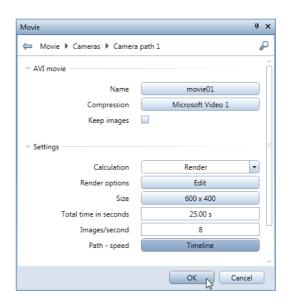
14 Using the Timeline button in the Settings area, you can make time settings for the movie. For example, you can modify the time between the camera positions.

Click OK to close the timeline.



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15 Finally, check the settings and click OK.



Note: Select the Keep images option only if you actually need the images. In addition to the AVI movie, the program saves all images calculated (see Number of images) to the folder you selected when you entered the Name. This can quickly lead to large volumes of data.

16 Start recording.

At any time during calculation, you can see how many images Allplan has already calculated.



You can find the final movie in the folder you specified (the project folder is the default setting). To view the movie, double-click it.

Using the settings above, it can take a few minutes to record the movie.

For a high-resolution, flicker-free movie select the following settings:

- Render method: Global Illumination (GI (IR+QMC)); set the default quality to high or very high.
- Size: match the size of the current viewport
- Images/second: 16

... and start recording just before you leave work.

Appendix

If you want to create the project and the building structure yourself, you can find useful information and step-by-step instructions on the following topics:

- Project organization managing data using ProjectPilot
- Using layers
- Project organization using the Default layer
- Creating a project
- Creating a building structure
- Defining print sets

In addition, you can find general information on the palette configuration and on drawing files.

The "Overview of tools" section shows you the most important tools you need in this tutorial.

Note: If you want to skip the general sections, continue as described in Creating a project (see "Creating the Training Project" on page 447).

Note: You can also download the project template for the training project from the Internet. For more information, see Project templates on the Internet (on page 476).

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Project organization

Project structure, i.e. the way in which you organize your data, is an essential part of any building design project. An efficient and logical structure will allow you to locate the data you need without having to perform tedious searches.

It is worth spending time carefully planning a project's structure before even drawing the first line. Consider the time and effort spent doing this as a good investment - after all, in the long term, it will save you time and money.

Allplan's flexible approach allows users to create their own office-specific structures which, in turn, can be altered to suit the needs of special projects.

Managing Data with ProjectPilot

What is ProjectPilot?

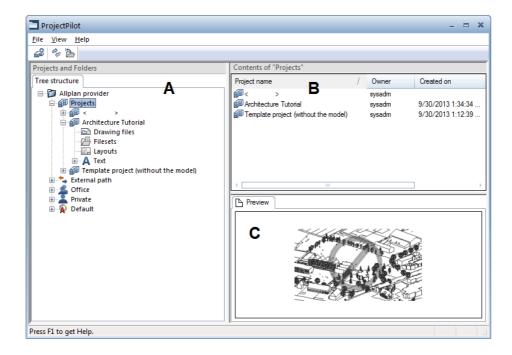
You use ProjectPilot to create and structure projects in a simple and clear manner.

ProjectPilot is a powerful data management tool developed specially for the data structure of Allplan. ProjectPilot provides tools for copying, moving, renaming and deleting data (e.g., projects, drawing files, symbols, etc.).

If you are already familiar with Windows Explorer, then you'll find that working with ProjectPilot is just as easy. You can use the shortcut menu for almost everything. If you find that you need to move or copy files, you can simply drag them to the new folder.

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User interface



Left window (A)

The left window shows the projects and folders in a tree structure. The current project is selected and open. Click the plus sign (+) to display the levels in a folder. Click the name of a folder to display its contents in the right window.

You can display the contents of the folder and open it at the same time by double-clicking.

Right window (B)

The right window shows the folders and documents in the selected node (in the left window). You can sort the displayed documents by clicking on the title of a column. Clicking in the background with the right mouse button lets you display the documents as a list or as icons.

Preview (C)

A preview of the currently selected document (drawing file, layout) is displayed in the preview area. To move the preview, click it with the middle mouse button and drag. To zoom in on an area in the preview, open a selection rectangle using the left mouse button. Double-clicking with the middle mouse button restores the preview to its original size. Alternatively, press the * key on the number pad.

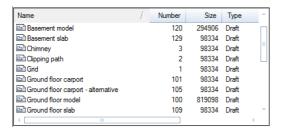
To display in an isometric view: use the number keys on the number pad. Check that the Num Lock key is active as you do so.

Common approaches in ProjectPilot

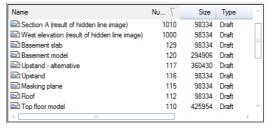
If you are already familiar with Windows Explorer, you will quickly find your way around ProjectPilot. You can accomplish most steps using the shortcut menu or drag-and-drop operations.

Sorting the documents displayed

You can sort the displayed documents by clicking on the title of a column. The first time you click the column title, the documents are sorted in ascending order. Clicking the same column title again sorts the documents in descending order. An arrow is displayed to indicate which column is being sorted and whether sorting is in ascending or descending order.



Sorted in ascending order (arrow points upwards) and according to drawing name



Sorted in descending order (arrow points downwards) and according to drawing name

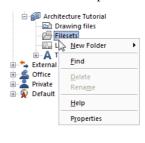
Copying and moving using drag-and-drop operations

Instead of using the shortcut menu, you can also drag selected documents in order to move or copy them. Select the documents, click within the selection with the left mouse button, keep the mouse button pressed down and then drag. You can tell whether this is possible by the shape of the cursor when the mouse pointer is positioned over the destination area.

Cursor	Meaning
<u>+</u>	The document will be copied to the folder that is below the mouse pointer.
	The document will be moved to the folder that is below the mouse pointer.
	Note: To move documents, hold down the SHIFT key while dragging the documents.
	A shortcut to the document will be created in the folder below the mouse pointer (e.g., when assigning drawing files to a fileset).
0	The document cannot be placed here.

Working with the shortcut menu

Almost all tools available in ProjectPilot can be accessed via the shortcut menu. Depending on which element you click, a shortcut menu appropriate to the element opens.





New Folder

Architecture Tutorial

Structure..

Copy Project to...

Exter Office

Defaul

Shortcut menu of a project

Shortcut menu of the fileset folder

Using the preview

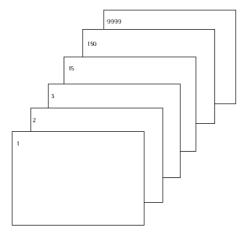
A preview of the selected document is displayed in the preview area. In this view, you can zoom, pan and select isometric views. Click **Preview** on the **View** menu to specify whether and where the preview is placed.

- To switch the preview off: point to Preview on the View menu and click None.
- To zoom: use the left mouse button to open a selection rectangle around the area you want to view in detail. The cursor changes to crosshairs.
- To pan in the preview: move the view with the middle mouse button. The cursor changes to a hand. Alternatively, use the cursor keys.
- To restore the full view of the image in the preview: double-click in the preview are with the middle mouse button, or press the * key on the number pad.
- To display in an isometric view: use the number keys on the number pad. Check that the Num Lock key and the preview are active as you do so.

Note: The preview is only available with certain documents (drawing files, layouts).

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

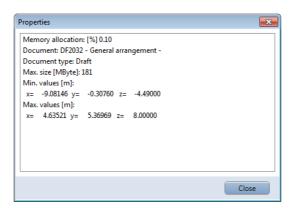
With the drawing file status, you define the drawing file on which you draw and which drawing files are visible and/or can be modified. The following illustration shows the different drawing file statuses. An explanation is provided in the table below.



Number	Drawing file status	Comment
1	Active	The active drawing file is the one on which you draw. There must always be one 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 and/or reference mode).
3	Open in reference mode	Elements in drawing files open in reference mode are visible, but 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 X Options , click Desktop environment and open the Display page. Empty drawing files cannot be opened in reference mode.
4	Inactive	Elements on inactive drawing files are not visible.
5	Empty	Empty drawing files have no data type icon.
6	Assigned tempora- rily	The drawing file is assigned temporarily to the fileset; this assignment is removed when 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	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. Using the Options, Desktop environment page, you can confirm the resource to inform the page, you can confirm the resource to inform the page, you can confirm the resource to inform the page, you can confirm the page of the page of the page of the page of the page.

Information on the active drawing file

To get information on the active document, click in the workspace with the right mouse button and on the shortcut menu, choose **Properties**. An information box with all the important information about the file opens.



Information	Meaning
Memory allocation	This shows how much of the memory reserved for a file has already been allocated (as a percentage). Background information: a certain amount of memory is reserved for files.
Document	The number of the current file is displayed here. The number is also displayed in the title bar of the Allplan application window.
Document type	The file type is displayed here. This corresponds to the data type icon that is displayed in the status bar.
Max. size	The maximum amount of memory available for the file is displayed in Kbytes.
Min./Max. values	The minimum and maximum coordinates in the file are displayed here.

Using layers

Understanding layers

Layers provide an additional means of structuring design entities within drawing files. You can display exactly the information you need just by switching the relevant layers on and off. This way, you can see better what you are doing and proceed quickly.

You can use layers to define the format properties of elements.

Layers are important organizational elements. Their importance increases the more people are involved in a project and the more a CAD system is used for the specialist design processes. Layers do not replace drawing files. Rather, they complement them.

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Defining the current layer

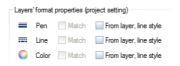
When created, each element is given the current layer. The layer which is used as the current layer is governed by the following settings:

- When you activate a tool (e.g. line) for the first time, a specific layer is automatically selected as the current layer (if the Auto-select layer with tool option is selected in the Layer dialog box). The layer in question depends on which tool you activate. If the Auto-select layer with tool option is not selected, the program automatically uses the layer you selected last.
- The Layers palette shows the current layer. Now you can change
 the layer status with just one click.
 You can display the entire layer hierarchy, the layers assigned to
 the currently selected tool or the layers used in open documents.
 To do this, you can use the extensive shortcut menu of the Layers palette.
- You can use Select, Set Layers or the Format toolbar to define a different layer as the current one. This layer will then automatically be used as the current layer the next time you activate the tool.
- When you save components as styles or favorite files, the layer currently set is also saved. When you retrieve these components later, the layer saved is automatically set as the current layer.
- Normally, openings like recesses in walls and slabs or window and door openings get the same layer as the element into which they are inserted. Click the Special button in the Options Components and architecture Miscellaneous area to specify whether these openings can be assigned separate, independent layers.
- As walls can consist of multiple construction layers and each layer can have different format properties, you can define the layer for each of the construction layers in a wall or upstand directly in the Properties dialog box (you usually make these settings on the Format toolbar).

Setting the format properties of layers

Every layer has **pen**, **line** and **color** properties. In the Layer dialog box, you can specify that an element is to automatically assume the properties of the layer on which it is drawn.

The format properties of a layer can also be defined as a line style and saved under a name of your choice. Elements can then assume the format properties of this layer.



When defining line styles, you can specify how they change with the scale or drawing type. You can define different line styles for various scale ranges and/or drawing types so that the elements are displayed and printed differently, depending on the reference scale or drawing type set. Using line styles, you can work on a scale-independent basis.

Drawing types define how elements are displayed on screen and in the printout. The display of the elements varies depending on the selected drawing type. Requirements: the format properties are taken from the layer (in a fixed manner) and the use of line styles is selected. 442 Using layers Allplan 2015

Layer access rights

There are different layer access rights. On the one hand, there is the visibility setting which controls whether a layer is visible or hidden. On the other hand, there is the edit setting which controls whether a layer can be edited or not (i.e. it is frozen). You can save visibility settings in print sets (see "Using print sets" on page 446) and edit settings in privilege sets. The status of a layer is represented by icons in the Layer dialog box (Select Layer/Visibility tab) and in the Layers palette:

Icon	Access right	Explanation
	Current	The layer on which you draw.
	Modifiable	Elements in this layer are visible and can be modified.
	Visible, frozen	Elements in this layer are visible but cannot be modified.
	Hidden, frozen	Elements in this layer are not visible and cannot be modified.

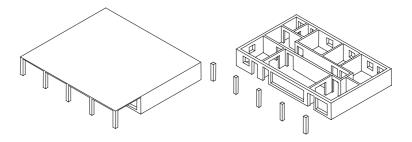
You can restrict access to layers using the Select Layer/Visibility tab or the Layers palette. For example, you can change the status of layers from Modifiable to Visible, frozen.

Layer access rights also depend on the privilege set to which a user belongs. Therefore, you cannot assign a higher status to layers (for example, set hidden layers to modifiable) when you belong to a privilege set that is not granted full access rights to the relevant layers.

Setting layer visibility in drawing files

You can set layers so that they are visible or invisible and thus show/hide the corresponding elements.

This way, you can quickly hide the elements you don't need during the current design phase, selectively modify elements in the displayed layers, check your plan and see whether all the elements are assigned to the desired layer. For example, you might choose to hide the slab layer and then view the spatial arrangement of the building as a hidden line image in perspective view.



Note: Click an element with the right mouse button and, on the shortcut menu, select Modify Layer Status and then Isolate layer - set all other layers to hidden to hide all the layers with the exception of the layer on which the element clicked is located.

If you find that you often require the same combination of visible and hidden layers (for dimensioning or labeling at certain scales, for example), then it is best to define what is known as a print set. You can also use print sets when assembling your layout later on so that only the visible layers print.

Note: You can choose to Display elements on frozen layers using a fixed color by selecting this option in the Layer dialog box.

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Managing layers and layer structures

The management of layers and layer structures is generally the responsibility of the office administrator. This person defines which layers are used, sets up the privilege sets and grants access rights. The designers (architects, engineers, etc.) are assigned to the privilege sets and thus automatically have the relevant permissions.

When you create a project, you can decide whether you want to use the layer structure of the office standard or a project-specific layer structure.

You can name and save layer structures and retrieve these structures later. If you have assigned line styles to layers, they are saved together with the layer structure (with the same file name plus the extension .sty). When importing a layer structure you saved, you can decide whether to import the associated line style file, too.

Advantages of data organization using layers

With large projects in particular, organizing data using layers has significant advantages:

- Associative elements such as wall dimensions or sill elevation labels - reside in the same drawing file and yet can still be hidden from view.
- In order for the interaction between elements to function cleanly, the components in question have to reside in the same drawing file. This is also the case for certain analysis and evaluation operations. With layers, you can meet these requirements easily.
- Easier to assemble layouts thanks to print sets. Print sets are user-defined compilations of layers. These can also be used when editing and assembling layouts. When assembling a layout, you can choose to display only the elements in a specific print set switching between 1:50 and 1:100 is thus no problem.
- Exporting drawing files to DXF/DWG layers is easier as you can assign each layer in a drawing file to a different DXF/DWG layer. When importing DXF/DWG files, the DXF/DWG layer structure can be automatically integrated in the layer hierarchy.
- The layer of an element can often be modified more quickly than the element's assignment to a drawing file.

 You can quickly create layers that are not included in your layer structure and then use these layers in all the drawing files of a project.

- As a project can contain more layers (approximately 65,000) than drawing files (9,999), layers allow you to distinguish more precisely between the individual design entities.
- You can display and edit 65000 layers at once whereas the number of drawing files that you can have open simultaneously is 128.
- Layers can be shown and hidden very quickly (using print sets or favorites).
- You can change the format properties of a layer later. All the
 elements of this layer that were drawn using the From layer, line
 style setting will adapt automatically. This way, you do not need
 to modify them separately.
- You can copy format properties including layers by double-clicking with the right mouse button. This method also works with wizards. Similarly, you can use Copy Format to quickly copy the format properties of an element and apply them to other elements.

Relationship between layers and drawing files

The use of layers doesn't mean that drawing files don't play a role when it comes to organizing your data. With large project in particular, a combination of both is essential. With the same structural depth, the number of drawing files required is far less when working with layers.

The number of drawing files you need not only depends on the size of the project, but also on your hardware. Modern, fast computers with a lot of memory can handle a lot more data per drawing file without this leading to a noticeable downturn in performance.

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The interplay between layers and drawing files depends on the following factors:

- The size of the project and the number of designers involved at any one time.
 - If several designers are working on one floor, create one drawing file per area of responsibility (e.g., East Wing, Central Unit, West Wing, for example.)
- Simultaneous involvement of specialist designers on the project.
 Separate drawing files should always be used for the specialist designs in order to facilitate concurrent activity.

Using privilege sets

Access to layers can be controlled by means of privilege sets. Privilege sets are generally assigned when there are several people working on the same project: when working with Workgroup Manager, you can assign individual users to one or more privilege sets. As a result, these users can only see and/or edit the layers that are associated with the relevant privilege set.

Privilege sets not only control who accesses which layers. By defining privilege sets with a selection of layers that are to be available while drawing, the entire design process can be facilitated.

When you install the program, the privilege set ALLPLAN is created automatically. This privilege set has read and write access for all layers.

Using print sets

A print set is a set of layers that you can select when compiling and arranging layouts. You can also use print sets to control which layers are visible/hidden. Only the elements in the selected print set are displayed in the layout.

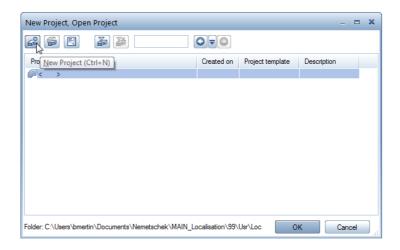
For example, you can select a print set for working drawings so that only the data that is relevant to a working drawing appears in the final printout.

Creating the Training Project

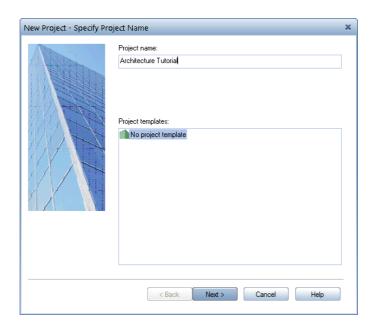
Start by creating a project.

To create a project

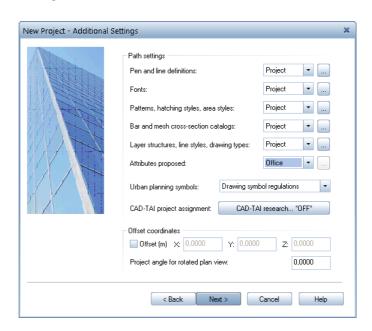
- 1 On the File menu, click Project, Open Project.
- 2 In the Open Project dialog box, click New Project, Open Project....



New Project - Specify Project Name
 Enter Architecture Tutorial for the project name and click Next
 .



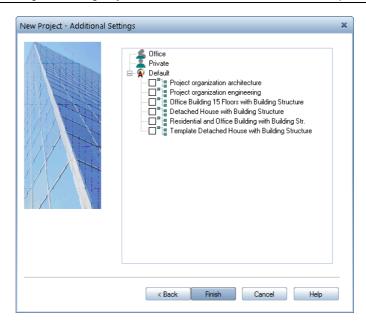
4 New Project – Additional Settings
Check that all path settings (except Attributes proposed) are set to Project. Then click Next > to confirm.



5 New Project - Additional Settings

If the Template - Detached house with building structure is selected, clear this check box. You will create your own building structure.

Click Finish to confirm the dialog box.



You are back in Allplan; the Architecture Tutorial project is open.

Note: You can also create a new project using ProjectPilot (File menu).

Path settings

This defines which pen, line, hatching settings, fonts and material catalogs are used. 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 are working 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/or hatching styles, to apply to this project only (in which case they will probably be different to those used as the office standard).

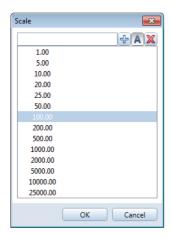
Setting the scale and unit of length

Define scale and length settings for the project.

Start by setting the reference scale to 1:100.

To set the reference scale

1 On the View menu, click Reference Scale.

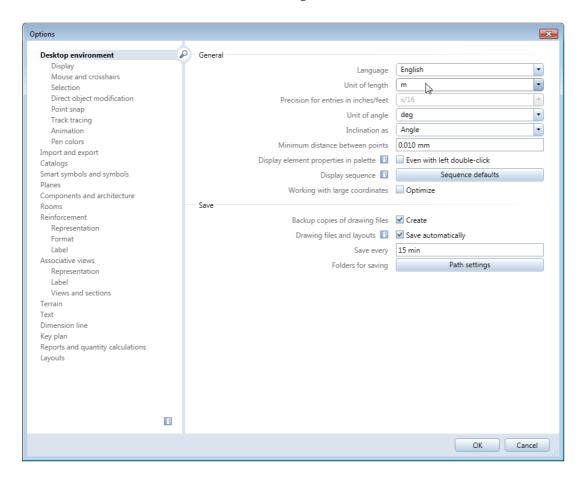


Tip: Alternatively, you can set the scale in the status bar: click to the right of scale and select 1:100. 2 Click 100.00 in the Scale dialog box.

Set the unit you want to use to enter values. The values are to be interpreted in meters.

To set units

- 1 Click **3** Options (Standard toolbar) and select Desktop environment in the dialog box.
- 2 Set the Unit of length to m.



Tip: Alternatively, set the unit of measurement in the status bar: click to the right of Length and select m.

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

Building structure

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. Allplan provides two options you can use to structure drawing files in a project:

- the building structure and
- the b fileset structure.

You can select either option in the Open on a project-specific basis: drawing files from fileset/building structure dialog box. Click

Open on a Project-Specific Basis (File menu or Default toolbar).



Use the building structure to clearly structure the training project of this tutorial. The advantage of working with the building structure is that views, sections and building lists can be generated quickly and easily.

An important difference between the building structure and the fileset structure is that each drawing file can only be assigned once in the building structure. To create the building structure for the training project, do the following:

- 1 define structural levels
- 2 assign heights of structural levels (Floor manager)
- 3 assign drawing files for structural levels (create building structure)
- 4 name the drawing files

Note:

Advanced information on the building structure is provided in the Allplan help.

Creating structural levels and the plane model

Now you will create your own project structure. It is advisable to work with stories and print sets in a real project.

Our example involves a detached house of which you will design the basement, ground floor and top floor.

When creating the building structure, you start by defining the necessary structural levels. This example requires the Building and Story structural levels. To set up the structural levels, you will use the Floor Manager tool.

Using the floor manager, you first define the number of stories and assign height settings to the entire building and the individual stories.

In the Floor Manager dialog box, you can also configure Allplan to create the building structure automatically. If you have selected this option, you can assign drawing files to the selected structural levels. In addition, you can specify whether to create views and sections.

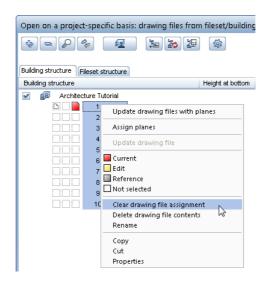
To define structural levels

- 1 Click Open on a Project-Specific Basis (File menu or Default toolbar).
- 2 Click **OK** to confirm the **Create custom building structure** option, which is the default setting.

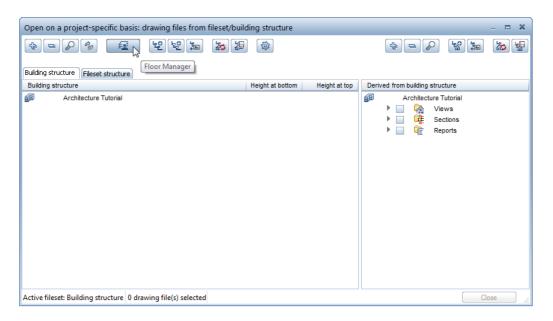


The program automatically assigned some drawing files to the building structure. You do not need these drawing files.

3 Select the drawing files, open the shortcut menu and click Clear drawing file assignments.

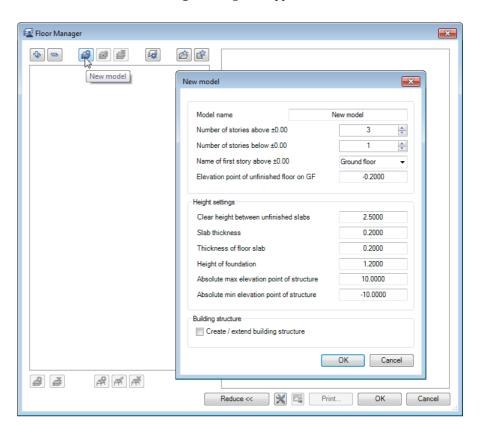


4 Click Floor Manager.



5 As you have not yet assigned planes to drawing files, choose No when you see the Would you like to update now? prompt.

6 The Floor Manager dialog box appears. Click PNew model.



7 Make the following settings in the New model dialog box:

Model name: Detached house Number of stories above 0.00: 2 Number of stories below 0.00: 1

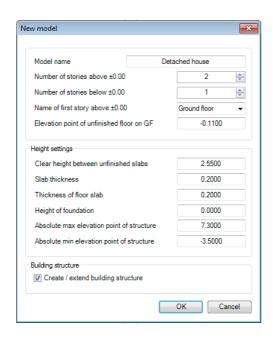
Name of first story above 0.00: Ground floor Elevation point of unfinished floor on GF: -0.11

Clear height between unfinished slabs: 2.55

Slab thickness: 0.20

Thickness of floor slab: 0.20 Height of foundation: 0.00

Absolute max elevation point of structure: 7.30 Absolute min elevation point of structure: -3.50



Do not forget to select the Create / extend building structure option.

8 Click **OK** to confirm the New model dialog box.

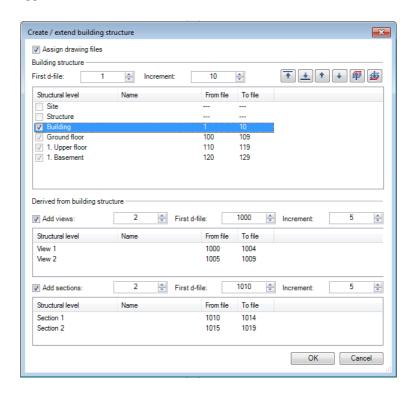
The Create / extend building structure dialog box opens.

9 Make the following settings in the Create / extend building structure dialog box:

- Enter the number 10 for Increment in the area at the top.

 The number of drawing files assigned to the structural levels changes.
- Enter names in the Name column (see illustration below).
- In the Ground floor line, From file column, click number 11 and change it to 100. Press ENTER to confirm. The drawing file numbers of the subsequent stories adapt automatically.
- Select Add views and enter the number 2.
- The First drawing file for the views should be the drawing file with the number 1000.
- Enter the value 5 in Increment.
- Select Add sections and enter the number 2.
- The First drawing file for the sections should be the drawing file with the number 1010.
- Enter the value 5 in Increment.

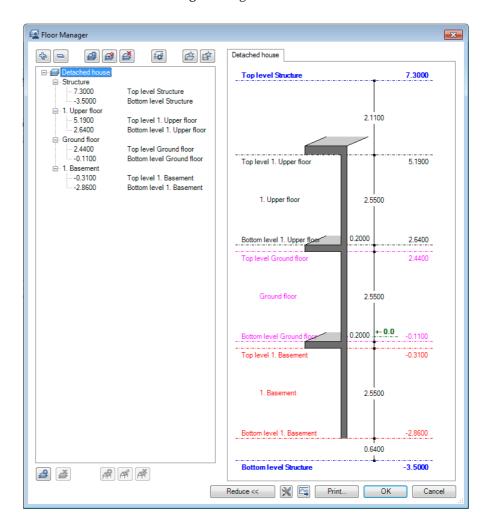
The Create / extend building structure dialog box should now appear as follows:



Note: You can use the 🛂 🚺 📬 🎓 buttons to change the sequence in which the levels that make up the Story structural level are displayed.

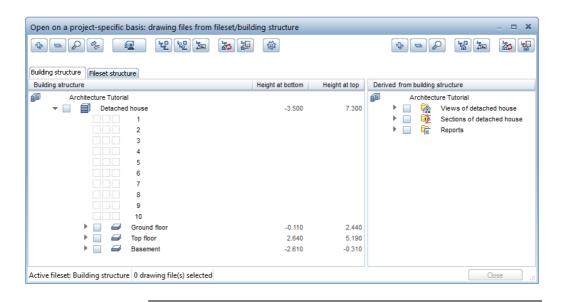
- 10 Click **OK** to confirm the **Create / extend building structure** dialog box.
- 11 Select Detached house in the Floor Manager dialog box (left pane) and click to display all entries.

The Floor Manager dialog box should now look like this:



12 Click OK to confirm the Floor Manager dialog box.

13 You are back in the Open on a project-specific basis: drawing files from fileset/building structure dialog box, which now looks like this:

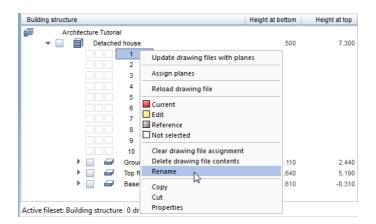


Naming drawing files

When you create a building structure, the last step is to name the drawing files.

To name drawing files

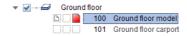
Select the relevant drawing file number. Click the drawing file number with the right mouse button. The number is highlighted blue and the shortcut menu opens. Click Rename.



2 Enter the drawing file names as shown in the table:

Drawing file num- ber	Name
1	Grid
2	Clipping path
100	Ground floor model
101	Ground floor carport
112	Roof
120	Basement model

4 Select drawing file 100 by checking the Ground floor box and activating drawing file 100 Ground floor model.



5 Click Close to quit the dialog box.

Tips on Project Organization

Allplan is a very flexible system that allows you to develop your own custom solutions for projects within the office. The structure presented here is intended as a guide and can also be used for large-scale projects. You can use the entire structure or just parts of it.

You will probably find this structure useful when you start. As you progress, you will be in a better position to judge what needs changing/adding to suit your own needs and requirements. We would like to emphasize once again that a carefully though out project structure will save time for everybody in the long run. The system has the following structure:

- Store general project information in drawing files 1-99. For example, the site plan, axis system or layout.
- Story design starts at drawing file 100.

 The first digit indicates the number of the story. The last two digits provide information on the contents. The sequence in which the drawing files are named should be identical on each floor.
- Use the drawing files starting at number 1000 for elevations and the relevant sections.
- Use the drawing files starting at number 2000 for detailing.

Setting up layers

When you created the project, you set the layer structure to Project. All the settings you make, therefore, will apply to this tutorial project only.

The office standard is thus unaffected by any changes. You will probably use the office standard in your daily work. The office standard's settings are defined by the system administrator and apply for the entire office.

Allplan 2015 provides a very extensive layer structure designed to meet a broad range of requirements.

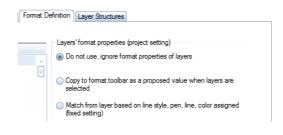
You can also define your own layer categories/hierarchies and layers. For this tutorial you will be using the layers in the main AR-CHITECTURE category.

You can specify whether the format properties (pen, line, and color) are based on your custom settings, whether these properties are proposed by the program and displayed on the Format toolbar (you can modify them at any time) or whether these attributes are always taken from the relevant layers (from the line style or the setting assigned to the layer).

In this tutorial, you will work independently of the predefined layer format properties and make these settings while drawing.

To disable predefined format properties

- 1 Click Select, Set Layers (Format toolbar) and then select Set.....
- 2 Switch to the Format definition tab and enable the Do not use, ignore layer's format properties setting.



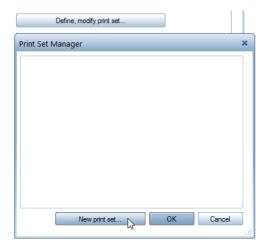
Defining print sets

A print set (see "Using print sets" on page 446) is a saved combination of visible and hidden layers.

Both when setting up your layouts and when turning layers on and off, activating a print set is a rapid way of showing/hiding only those layers that are required for a specific print set. First create and name the print sets. Then assign layers to these print sets.

To define print sets

- The Layer dialog box is still open.
- 1 Select the Print Set tab and click Define, modify print set....



- 2 In the Print Set Manager dialog box, click New print set....
- 3 Name the first print set SC Entry and click OK to confirm.



4 If you are working with Workgroup Manager, assign the user local to the print set.

- 5 Repeat steps 2 to 3 (4) and create more print sets:
 - PR Design
 - Model
 - SC Rooms

You can enter any name you choose. The names here mean the following:

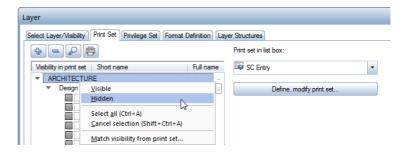
- PR: layout elements that are printed
- SC (SCreen)
- Model: contains the components for the visual 3D check.
- 6 Click **OK** to confirm the print set manager

Defining visible and hidden layers for the print sets

Now you need to define which layers are to be visible and which hidden in each print set.

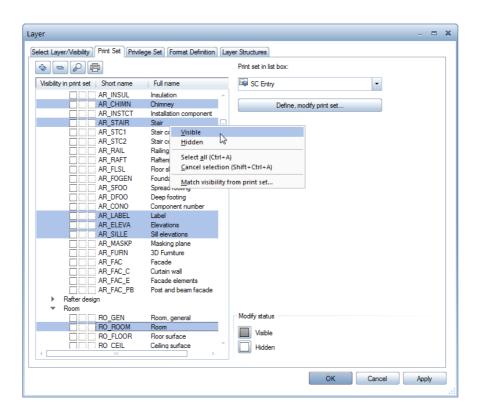
To define visible and hidden layers for the print sets

- **⊃** The Layer dialog box is still open.
- **⊃** The first print set **SC** Entry is displayed.
- 1 As only a few layers are to be visible, start by setting all architectural layers to Hidden. To do this, click Architecture with the right mouse button and, on the shortcut menu, choose Hidden.



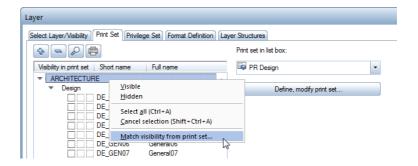
2 Press the CTRL key and select the layers which are to be visible in the SC Entry print set (see table below).

3 Click the selection with the right mouse button and click Visible on the shortcut menu.



Tip: For other print sets, you can transfer the setting of an already defined print set and then adapt it as appropriate.

- 4 Click Apply to save the current setting.
- 5 Select the next print set in the **Print set in list box** area and define which layers are to be visible and which hidden in this print set (see table below).



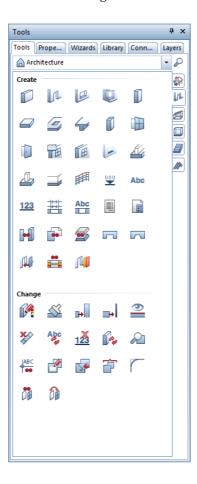
Category	Layers	Short name	SC Entry	PR Design	Model	SC Rooms
Draft	General 1	DE_GEN01	✓	✓		✓
	General 2	DE_GEN02	✓	✓		
	Grid	DE_GRID	✓			
	Furniture	DE_FURN	✓			
	Sanitary faci- lities	DE_SANI	✓			
text	Text 1:100	TX_100	✓			
Dimension Line	Dimension line 1:100	DL_100	✓	✓		
Architecture	Wall	AR_WALL	✓	✓	✓	✓
	Column	AR_COL	✓	✓	✓	✓
	Slab	AR_COL	✓		✓	
	Window	AR_WIND	✓	✓	\checkmark	
	Smart Window and Door Symbols	AR_SMSY	✓	✓	✓	
	Planes	AR_PLANE	✓			
	Roof	AR_ROOF	✓	✓	✓	
	roof covering	AR_ROOFH	✓		✓	
	Chimney	AR_CHIMN	✓		✓	
	Stair	AR_STAIR	✓		✓	✓
	Label	AR_LABEL	✓			
	Elevation specs	AR_ELEVA	✓			
	Sill height	AR_SILLE	✓	✓		
Room	Room	RO_ROOM	✓			✓

⁶ When you have assigned layers to all print sets, click Apply and then **OK**.

470 Palette configuration Allplan 2015

Palette configuration

In Allplan 2015 the palette configuration is set by default. This configuration displays the Tools, Properties, Wizards Library, Connect and Layers palettes on the left and the Filter Assistant and Edit toolbar on the right.



You can use the first three palettes to access the families, the modules and their tools, the properties of design entities and the wizards.

When the Tools tab is open at the top, the following options are available:

Drop-down menu at the top

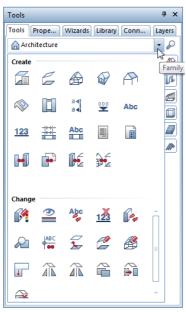
Tabs on the right

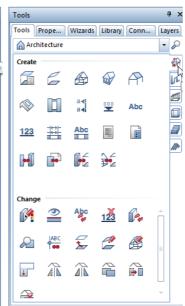
Available tools

Select a family:

Select a module:

Select a tool in the **Create** and **Change** areas:







472 Palette configuration Allplan 2015

Modify properties

When the Properties tab is open at the top, the following options are available:

Drop-down menu at the top Tools at the top and bottom Element properties

Select active elements

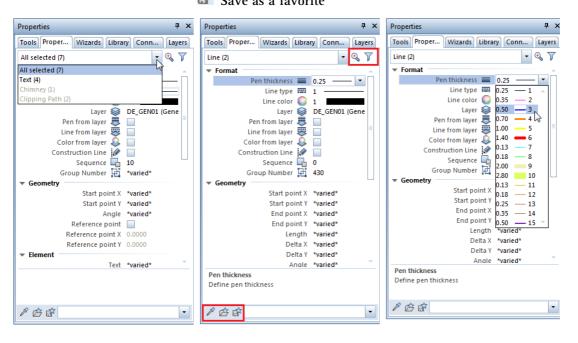
Filter Step by Step

Zoom in on selected objects:

Match parameters

Load favorite

Save as a favorite



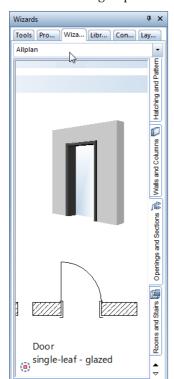
When the Wizards tab is open at the top, the following options are available:

Drop-down menu at the top

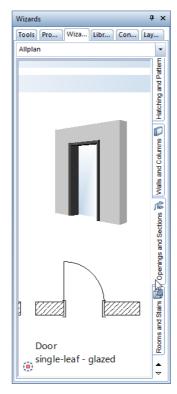
Tabs on the right

Available tools

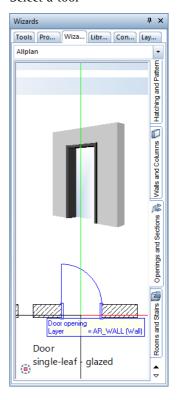
Select a wizard group



Select a wizard

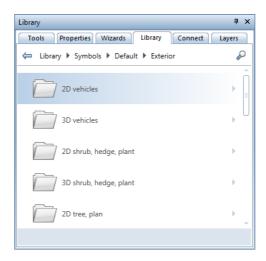


Select a tool



474 Palette configuration Allplan 2015

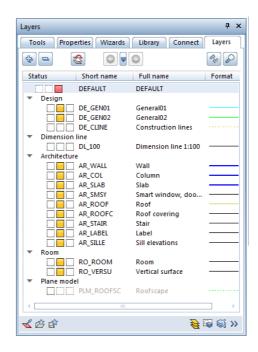
The Library palette takes you directly to the Symbols, Smart symbols and SmartParts library folders. You can select the objects you want to use. You can also add your own objects to the corresponding library folders.



The Connect palette takes you straight from Allplan to content provided by Allplan Connect. You can enter the user name and password directly in the palette or on the Palettes tab of the Customize... tool on the Tools menu.



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



Note:

You can customize the arrangement of the palettes for your needs using the Palettes tab of the Customize... tool (Tools menu). You can show and hide the individual palettes as you need.

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

Project Templates on the Internet

Allplan Connect offers two project templates:

- Allplan 2015 Architecture Tutorial. This project template comes
 with a building structure consisting of structural levels and assigned drawing files. It includes predefined objects derived from
 the building structure, such as views, sections and reports. In addition, it provides four print sets you can use to control which
 layers are visible.
 - You can use this project template if you want to start with Unit 1: Basics and work through the entire Architecture Tutorial.
- Allplan 2015 Architecture Tutorial (with model). This project template includes the data of the finished project with all the drawing files, views and sections as well as various reports. You can fall back on this project template if you do not want to work through the entire tutorial. In addition, you can use the Architecture Tutorial (with model) project template to compare this model with the model you created yourself.

Downloading project templates

You can download the project templates with the training data for this tutorial from Allplan Connect, the international service portal for all Allplan users.

Go to connect.allplan.com

• Register with your customer number and email address. Registration is free and not subject to any conditions.

The whole process only takes a few minutes.

- You can find the two project templates for this tutorial in Allplan Connect in the Training - Documentation - Manuals and Tutorials area.
- You can also find the latest version of this document as a PDF file (Allplan 2015 Architecture Tutorial).
- Save the zipped project templates with the training data to any folder on your computer.
- Extract the data in any folder, for example, C:\Training data for Allplan Architecture Tutorial.

Note: Serviceplus customers have access to a variety of step-by-step guides in the Training area of Allplan Connect. It usually takes one to two working days until you can access this restricted area and download these documents. Please note that this service is available to Serviceplus customers only.

For general information on Serviceplus, go to http://www.nemetschek-allplan.de/serviceplus

A note on organizing projects using the default layer

Allplan 2015 is a very flexible system that allows you to develop your own custom solutions for special projects and entire offices. The layers used in this tutorial provide essential support.

However, it is also possible to structure projects without using layers. In this case, the individual elements are arranged in drawing files.

The structure presented here for large-scale projects is intended only as a guide.

Drawing File Organization "Without Layers"

- General project-related information is stored on drawing files 1-99. This is universally required data (plan layout, axis system etc.).
- Story design starts at drawing file 100. The first digit indicates
 the number of the story. The last two digits provide information
 on the contents. The sequence in which the drawing files are
 named should be identical on each floor.
- Other material is stored starting at drawing file 2000. Numbers 2000-2099 contain sections. Numbers 2100-2199 contain the elevation views while 2200-2299 include the presentation data and 2300+ the detail drawings.

Fileset	File	Contents
Grid	1	Axis system (coarse)
	2	Axis system (fine)
	3	Axis dimensions
	4	Axis labeling
Layout	5	Title Block
	6	Legend
Surveying	11	Survey points
	12	Dimensioning
	13	Labels
	:	
Site plan	21	Boundaries of lot
	22	Neighboring buildings
	23	Existing building
	24	New building
	25	Hatching
	26	Dimensioning
	27	Text
	:	

Fileset	File	Contents
Outdoor facili- ties	51	Draft
	52	Symbols
	53	Dimensioning
	54	Design
	55	Text
	:	
Foundation	71	Foundations
	72	Hatching
	73	Sections
	74	Hatching
	75	Dimensioning
	76	Text
	:	
1st floor	100	Background pattern, fill
	101	Load-bearing walls
	102	Non-bearing walls
	103	Beams
	104	Stairs, elevator
	105	Slab
	106	Doors (2D)
	107	Windows (2D)
	108	Wall recess (2D)
	109	Slab recess (2D)
	110	Reflected ceiling
	111	Reflected plan
	112	Furniture
	113	HVAC
	114	Grids, axes
	115	Dimensioning

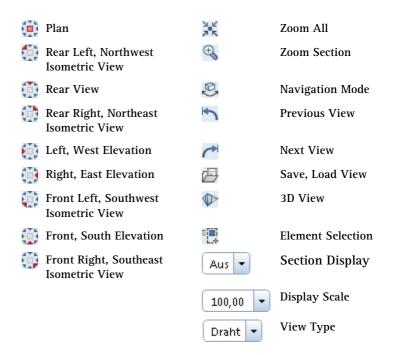
Fileset	File	Contents
	116	Additional dimensions
	117	Text
	118	Additional text
	119	Rooms
	120	Area
	121	DIN 277 areas
	122	DIN 276 costs
	123	Prelim. roof design
	124	Special components
	125	Adjacent components
	126	Foreground patterns, fills
	:	
2nd floor	200	Background pattern, fill
	201	Load-bearing walls
	:	
3rd floor	300	Background pattern, fill
	301	Load-bearing walls
	:	
Section A -A	2000	Section (hidden line image)
	2001	Details
	2002	Hatching, pattern, fill
	2003	Fixtures
	2004	Dimensioning
	2005	Text
	2006	Outdoor facilities
Section B - B	2010	Section (hidden line image)
	:	
	2019	

Fileset	File	Contents
East elevation	2100	Hidden line image, result
	2101	Details
	2102	Hatching, pattern, fill
	2103	Dimensioning
	2104	Text
	2105	Outdoor facilities
South eleva- tion	2110	Hidden line image, result
	:	
	2119	
Perspective views	2201	Hidden line image, result
	2202	Hatching, fill, textures
	2203	Outdoor facilities
	2204	Text
	:	
	2299	
Detail A	2300	Draft
	2301	Details
	2302	Hatching, patterns
	2303	Dimensioning
	2304	Text
	:	
	2309	
Detail B	2310	Draft
	:	
	2319	
	1	

Overview of Tools

We recommend photocopying this page and placing it somewhere near your monitor so that you can refer back to it as you work through the workbook.

Viewports



You can find more tools for working with viewports on the View menu.

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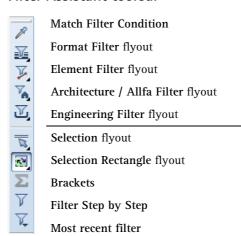
"Height" dialog box

You can use these icons to define how the component you are drawing – e.g., walls, rafters etc. – is attached to the reference planes.

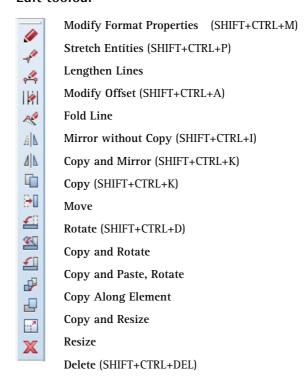
拿	Top level relative to lower plane	Use this to set the offset between the	
4	Top level relative to upper plane	top level of the component and the lower/upper reference plane.	
4	Bottom level relative to lower plane	Use this to set the offset between the	
4	Bottom level relative to upper plane	bottom level of the component and the lower/upper reference plane.	
\triangle	Absolute value for top level	Use this to set the top or bottom level of the component as an absolute	
∇	Absolute value for bottom level	height.	
Ż	Match bottom level of component Match top level of component	Use this to match the top or bottom level of a component from the top/bottom level of a different component or plane. When you select this	
		option, you need to click the reference level immediately.	
\$	Fixed component height	Use this to enter the component height directly.	
1	Vertical offset	This toggle controls whether the offset entered is to be interpreted as a vertical	
By	Perpendicular offset	offset or perpendicular to the plane.	
TT	Normal	This makes the component adapt to the upper plane in its entirety.	
T	Jamb wall	With this, the top, outside edge of the component will adapt to the upper reference plane.	
T	Chimney	With this, the component will pierce the upper reference plane by the value you specify.	
Ă	Maximum component height	When the top level of the component is attached to the upper reference plane, you can use this to have the component not exceed a certain height and to run horizontally at that height.	

The Filter Assistant and Edit Toolbars

Filter Assistant toolbar



Edit toolbar



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