

ACAD-BAU TUTORIAL

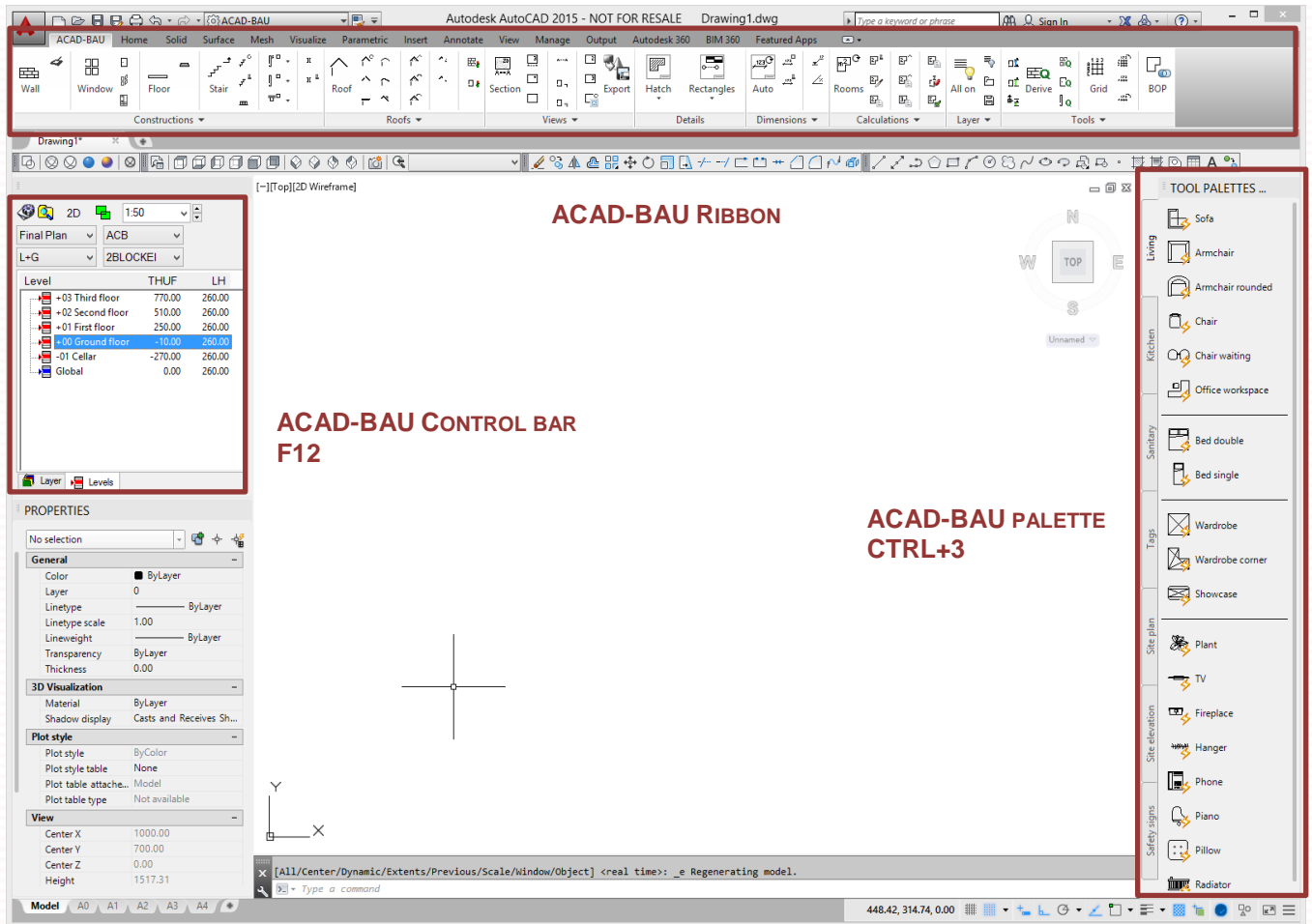


WWW.ARHINOVA.SI

For AutoCAD platform

August 2016

WORKSPACE



BASIC SETTINGS

Use **New** command and open the template called **ACB_International.DWT**. Drawing units are **cm**. Settings already defined in the template:

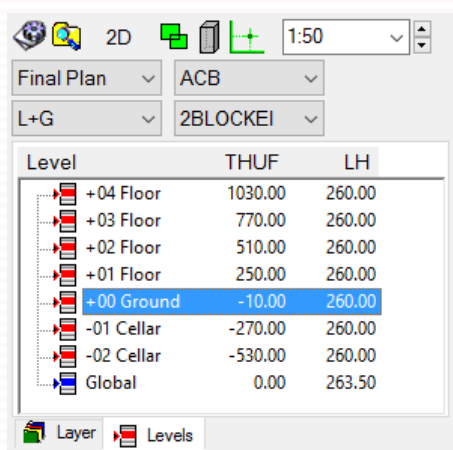
SNAP: (mouse step) 10 units are OK for preliminary design. For more detailed plans lower the value to 1 unit

GRID: (raster) 10 units

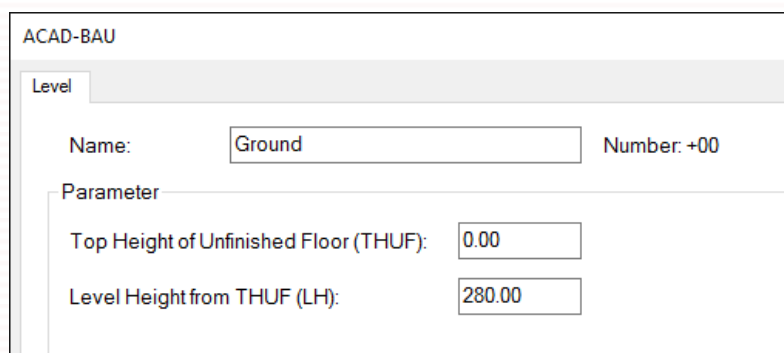
LIMITS: lower left corner: 0,0 and upper right corner: 2000,1400. Adjust the size corresponding to project size

OSNAP: Endpoint, Midpoint, Perpendicular and Intersection

LEVEL SETTINGS



On **ACAD-BAU Control bar** you can see all preset levels and their heights (**THUF** is Top Height of Unfinished Floor and **LH** is Level Height). For changing the settings, use the yellow folder button called **Settings**. Open **ACB** in upper left corner (click on + sign in front) and select **Levels**. On the right side choose **Ground** level with right click and select **Properties**. Set THUF on 0 and LH on 280. Confirm all changes.



Height Definition

Name:

Parameter

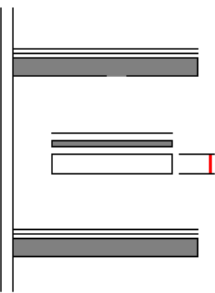
Constructive Height from Base:

Relative Base Height on Level:

Thickness of Unfinished Floor:

Floor Cover Thickness:

Screed:



On the right side double click on Ground floor to see its height definitions. The preset height definition is called **ACB0**. Use right click and select **Properties**. Set Unfinished Floor thickness to 30 and Screed and Floor Cover to 0 (Screed first). Set same values also for First and Second floor and their height definitions.

WORKING GRID

Orthogonal grid

Grid Representation

Width (from left to right)

Construction Rules:

Total Width:

Division Width:

Number of Grid Lines:

Text Type:

Counter Increment: ☐ Inverse

Start Number: Start Letter:

Prefix: Postfix:

Load / Save:

Length (from bottom to top)

Construction Rules:

Total Length:

Division Length:

Number of Grid Lines:

Text Type:

Counter Increment: ☐ Inverse

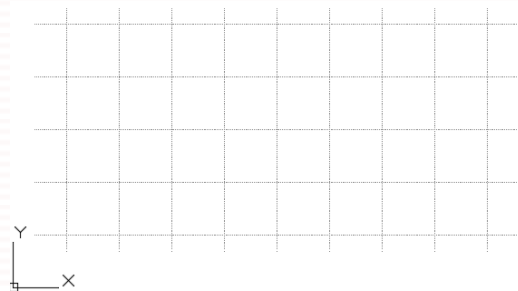
Start Number: Start Letter:

Prefix: Postfix:

3D:

OK Cancel

Working grid command can be found on **Ribbon ACAD-BAU / Tools / Grid**. Select **Settings** option (with shortcut menu or in command line). Select **Line distance and number of divisions** for Construction rules and define 9 vertical and 5 horizontal axes with 200 cm offset (as shown on the picture). Base is in the coordinate 200,200, angle is 0, the rest we confirm with Enter.



Grid uses certain style. It can be changed with double clicking the grid and setting up properties on **Representation** tab. Another way is loading settings from library, where some basic styles are saved. Activate **Grid** tab and select **Load grid** from Load/Save menu. Select the simple grid with dotted lines **ACB_Dotted.R17**. We want Grid to be visible all the time when changing levels, so we have to put it onto the Global level. Select the grid, use **Properties** palette (CTRL+1) and the **Height Definition** option to select **ACBG** level.

DRAWING THE PROJECT

WALLS

Wall

Wall Form Label

Name	Forced	Number of layers
Supporting 12	Supporting	1
Supporting 15	Supporting	1
Supporting 20	Supporting	1
Supporting 30	Supporting	1
Supporting 40	Supporting	1
Wall 1+20+1	Supporting	3
Wall 1+20+10+1	Supporting	4
Wall 1+20+10+1L	Supporting	4
Wall 20+10	Supporting	2
Wall 20+10W	Supporting	2
Wall 20+10E	Supporting	2

☐ Wall Stack

Height By:

Alignment: ☒ Inverse Layer Ordering

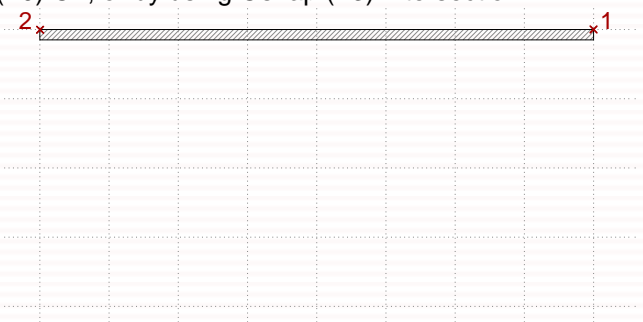
End Height:

Cutting Height:

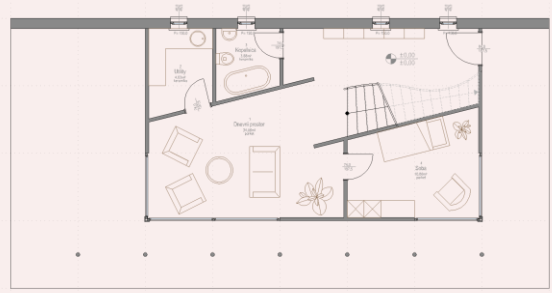
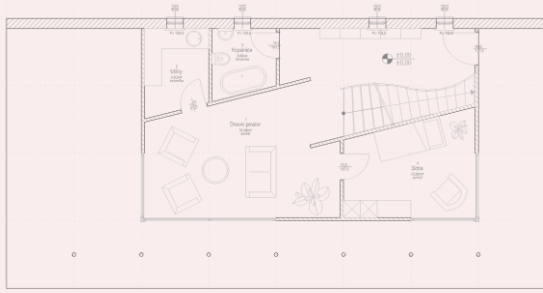
Load / Save:

OK Cancel

Use command on **Ribbon ACAD-BAU / Constructions / Wall** and select **Settings** option. Look for wall type **Supporting 30** in the list. Draw the wall on upper grid axis. Take care of accuracy with Snap (F9) On, or by using Osnap (F3) Intersection.

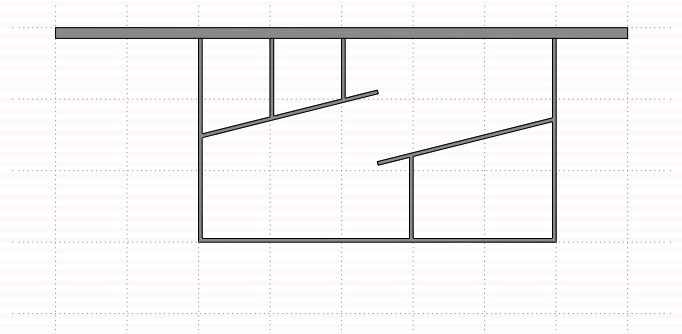
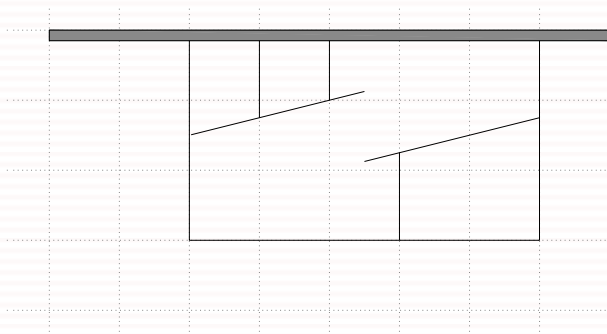


DISPLAY OF ELEMENTS



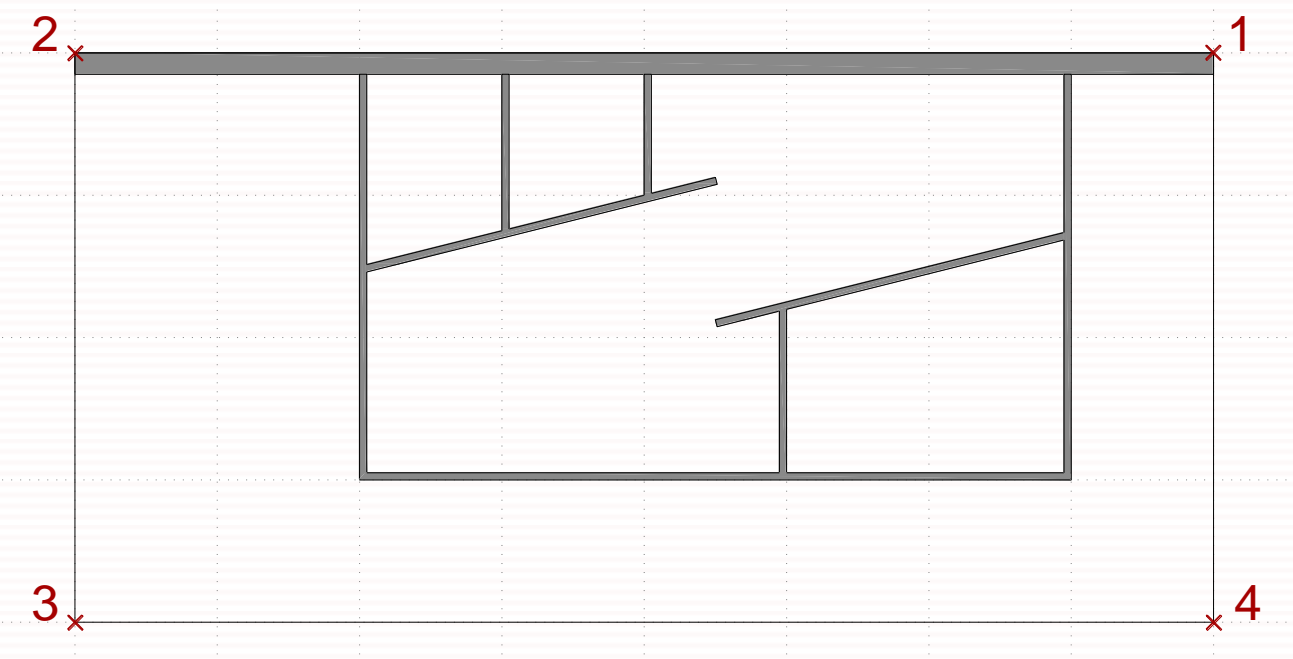
We can use different styles to display colors, lines, hatches and materials. Let's try with the simple style **ACB_Tutorial.lpr** that we find on **Ribbon ACAD-BAU / Layer / Load Layer Properties**. Choose option **Load** and look for it among saved files.

Preconstruction Polylines will define edges of non-supportive walls. Insert them using Tutorial tool palette – button **Preconstruction Wall**. If Tool palettes are hidden, press the upper right button to open them. Use command **Wall** on **Ribbon ACAD-BAU / Constructions** and select **Settings** option. Choose **Non-Supporting 10** from the list and use **Derive** option. Select all new Polylines in the drawing and press Enter until the command is finished.

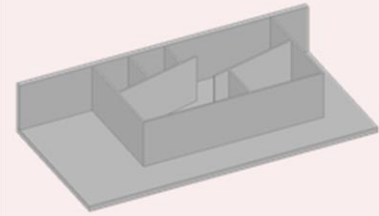
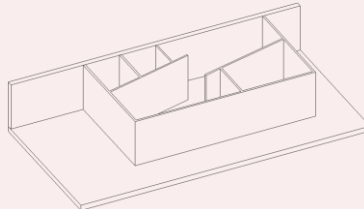
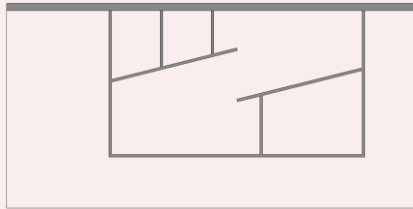


FLOOR

Floor is usually drawn automatically, if its boundary fits to building outline. In our case, we will draw it manually. Command is located on **Ribbon ACAD-BAU / Constructions / Floor**. Pick 4 points on outer grid line sections with Osnap Intersection as shown on the picture.



3D VIEW



While drawing in plan view, 3D model is built simultaneously. We can take a look at it with pressing any of the axonometric icons on the **View** Toolbar (for instance SW Isometric).



For shaded model or model with hidden lines use **Realistic** or **Hidden** icons on **Visual Styles** Toolbar. Return back to basic plan view with **Top** command (Toolbar **View**) and **2D Wireframe** (Toolbar **Visual Styles**). Alternative is using 2 saved views from the template: **PLAN** and **AXONOMETRY** found in the list on the end of View toolbar.

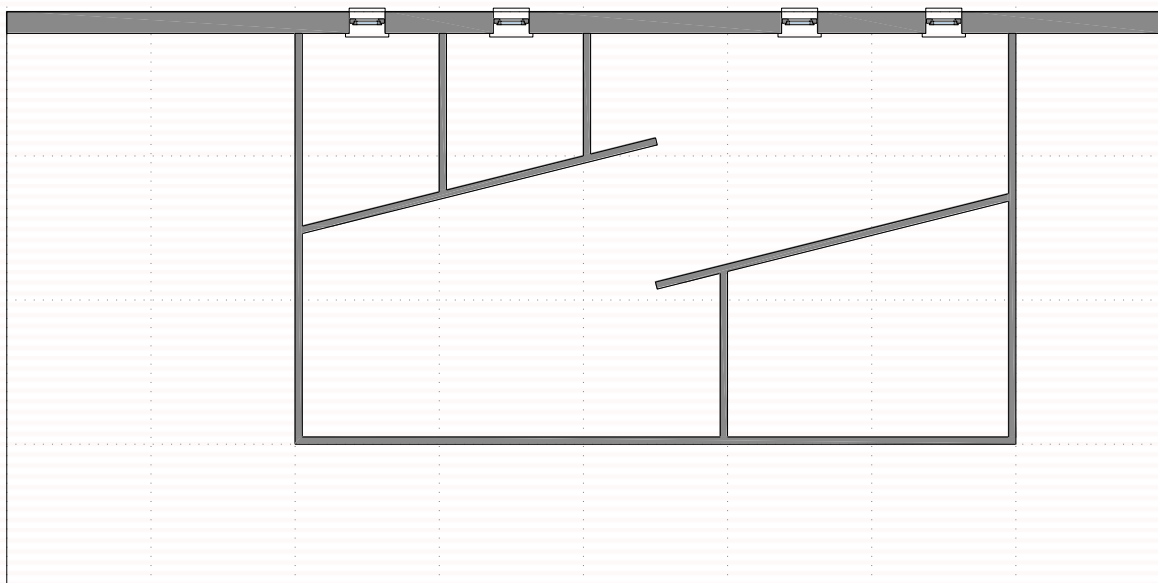
OPENINGS

WINDOWS

Command for drawing windows can be found on **Ribbon ACAD-BAU / Constructions / Window**. Choose **Settings** option.

On **Dimensions** tab set **Width** and **Height** to 50, then select **Height** in **Fixed Height** drop down list and set **Parapet** to 150 as shown on the picture. As a result, Lintel recalculates automatically to 200 (press TAB for recalculation)

Press OK to insert windows in between the grid lines using SNAP (F9) and Grid (F7) for precision. OSNAP (F3) is not needed in this case.



Corner Window

Dimensions Rebate Details Sash Dimensions Miscellaneous Label

Window Dimensions

Height: 250.00

Lintel: 250.00

Parapet: 0.00

Fixed Height: Parapet

Post Casing: 2.00

Rebate Casing: 6.50

Material: Corner window facing FECKVBL

Load / Save: Current corner window

Settings

Stone Grid: No stone grid

Base Point: Finished dimensions

Dimension Type: Inner structural dimensions

OK Cancel

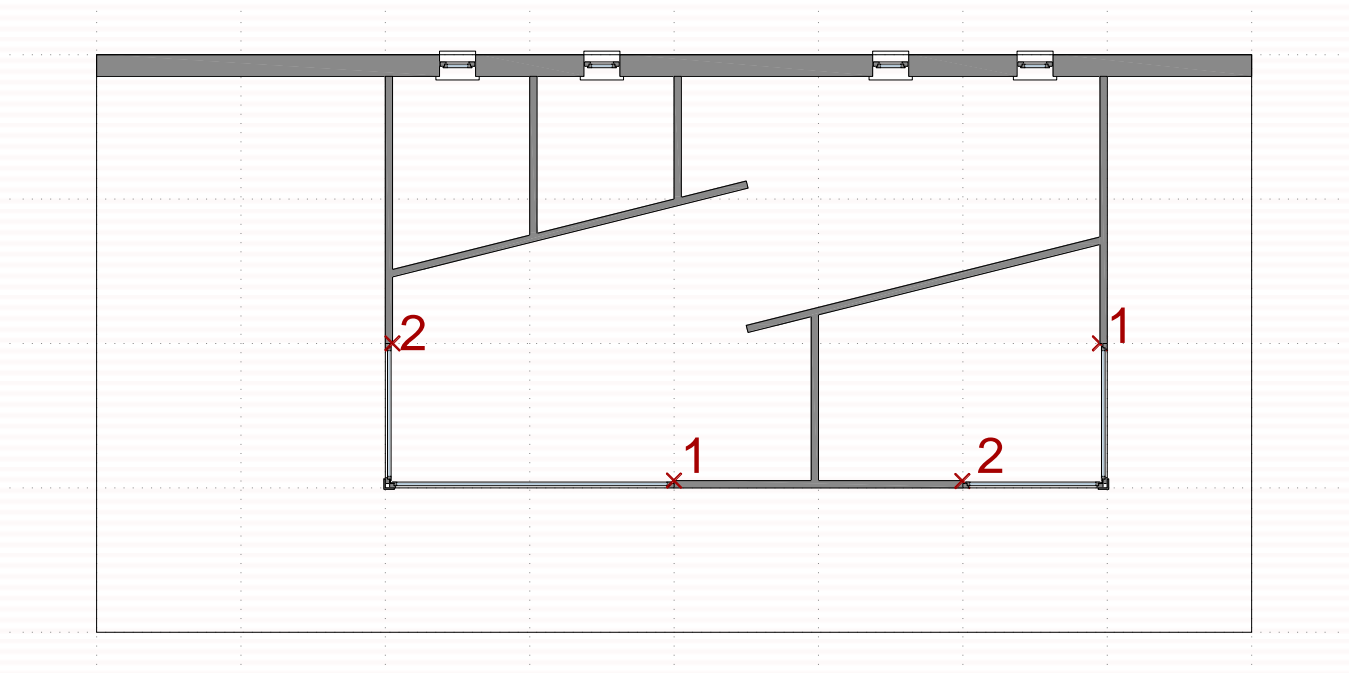
CORNER WINDOWS

Command for drawing corner windows can be found on **Ribbon ACAD-BAU / Constructions / New Corner Window**.

Choose **Settings** option.

On **Dimensions** tab load the file **Panoramic Corner window** from Load / Save drop down list. Settings for window without Parapet are loaded. Fix Parapet (=0) in **Fixed Height** drop down list and set **Height** to 250 as shown on the picture. As a result, also the Lintel is corrected to 250. On **Rebate** tab correct the **Depth** to 0.

Press OK and pick the first and last point of the corner window on the raster. All intermediate points are detected automatically. Repeat the command to draw the second window.



Sash

Sashes Sash Design Sash Dimensions

Construction

Horizontal: 2

Vertical: 1

Delete

Sashes

Type: Opens to the inside

Width: 193.00

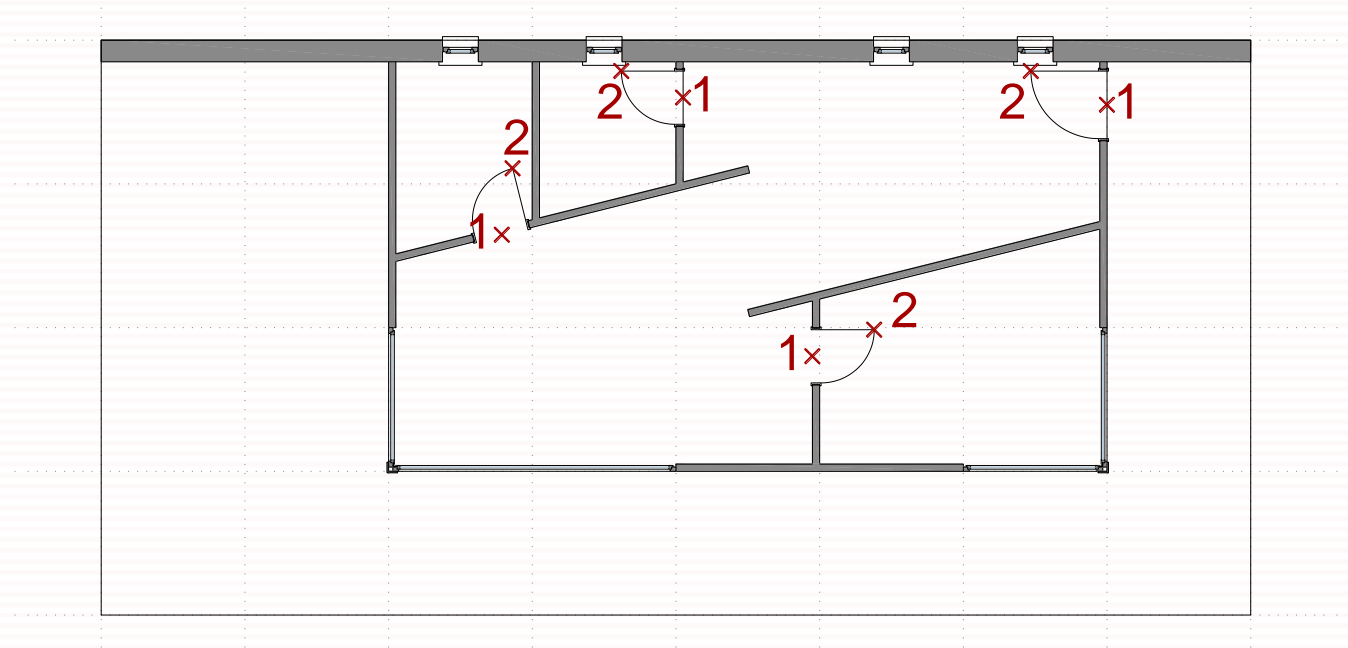
Height: 242.00

OK Cancel

Select the left corner window and right click to select **Design Corner Window** command. Select **Design** option and pick close to the longer horizontal side. Arrow is drawn to confirm the right element selection. Press Enter. On the **Sashes** Tab put 2 in Horizontal field and click **Horizontal** button to make the division. Press OK.

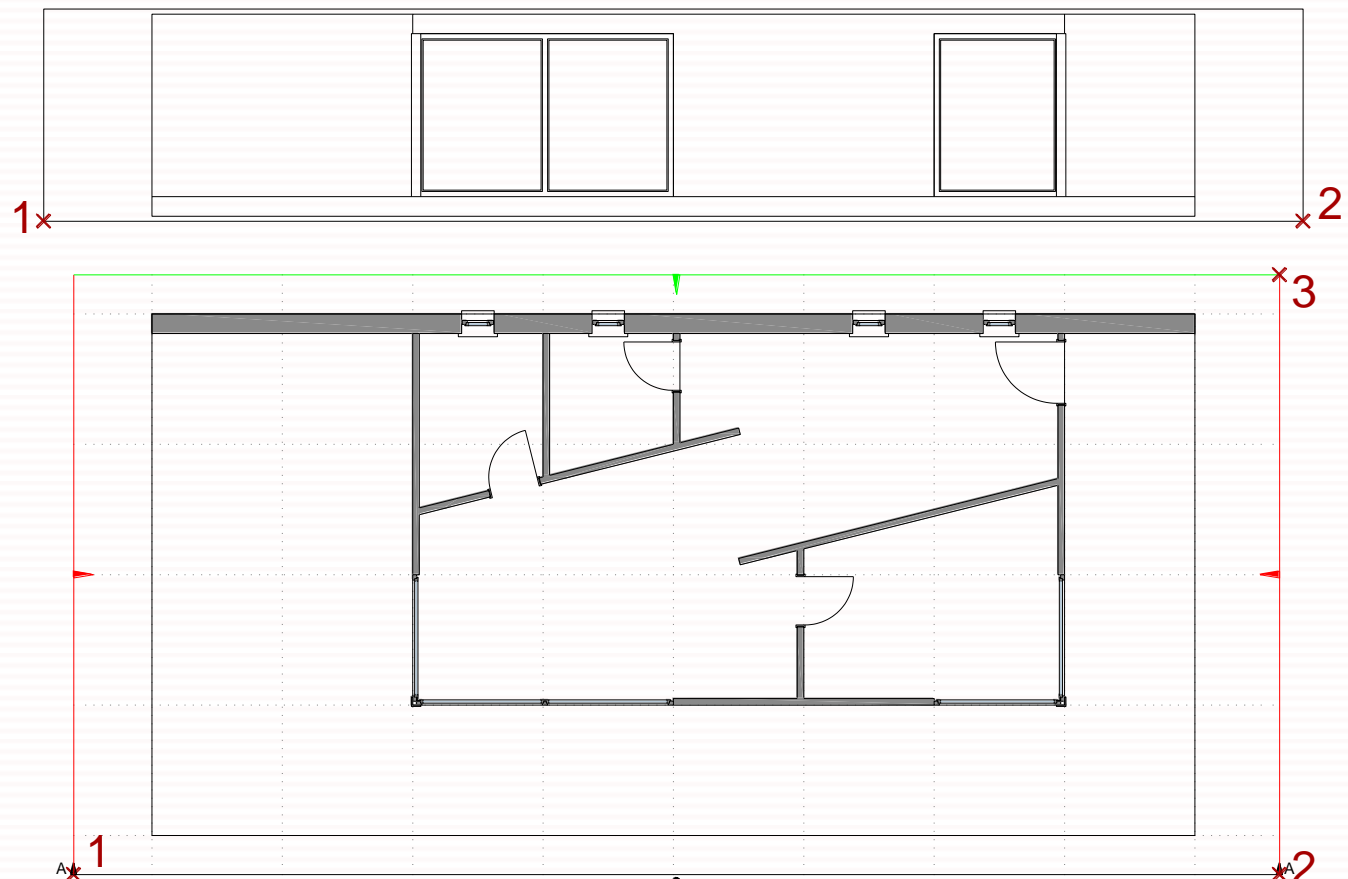
DOORS

Command for drawing doors can be found on **Ribbon ACAD-BAU / Constructions / New Doors**. We have to pick 2 points. 1st defines the door location in the wall and the 2nd wing opening direction. Door jumps into the wall automatically when we come close with the mouse cursor. By moving the mouse, we define the proper position of door opening. Later we move the mouse around the opening and door wing is following. We pick when the proper wing opening direction is shown. For the entrance door choose **Settings** option and Dimensions tab to set Width to 100.

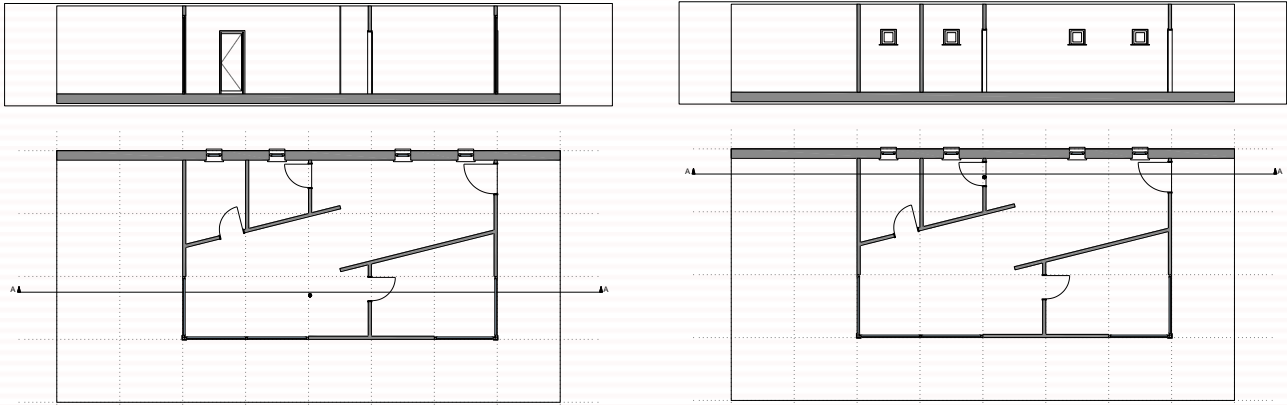


VIEWS

To have a better overview of the building model, define a view with command **Ribbon ACAD-BAU / Views / View**. Command inserts a new 2D view (façade, section, axonometric view...) beside the plan we are working on. 2 points have to be defined for the view itself (location and rotation) and then 3 more points (location, rotation and size) for the extents of the model we want to show in the view. Last 3 points, that define the Clip Box, should surround whole model in our case.



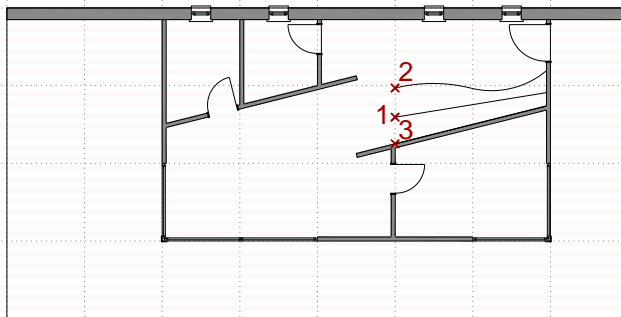
With moving the middle grip on the A-A section line, the view changes from façade to section through given point.



Later we will switch among different levels, but the defined view should stay visible. Therefore we will move it to the Global level. Select the view and in **Properties** palette (CTRL+1) select the level **ACBG** in **Height Definition** list.

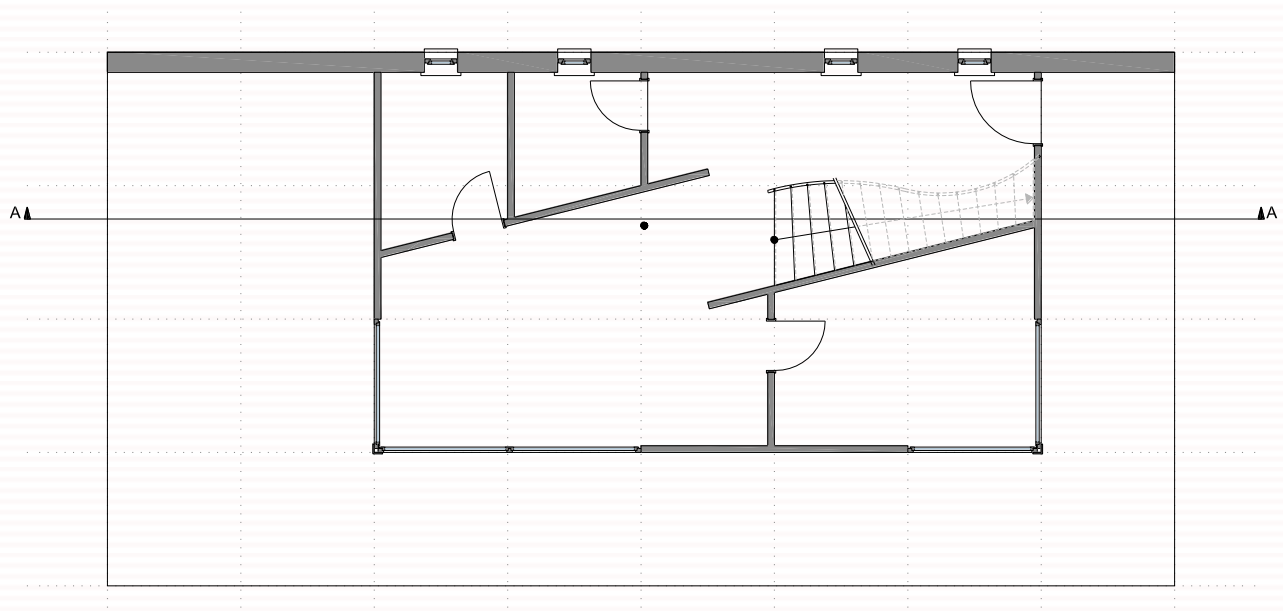
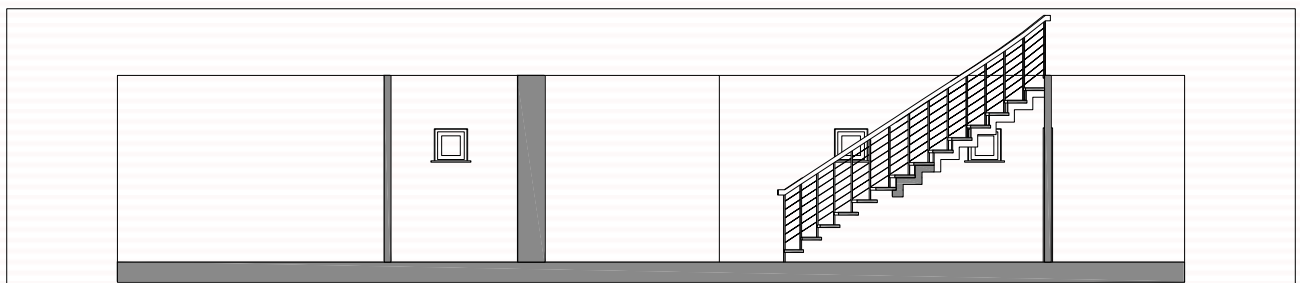
STAIRS

Take stair preconstruction lines from the Tutorial Palette – click **Preconstruction Stair** button. 3 Polyline objects are inserted as contours of future stairs.



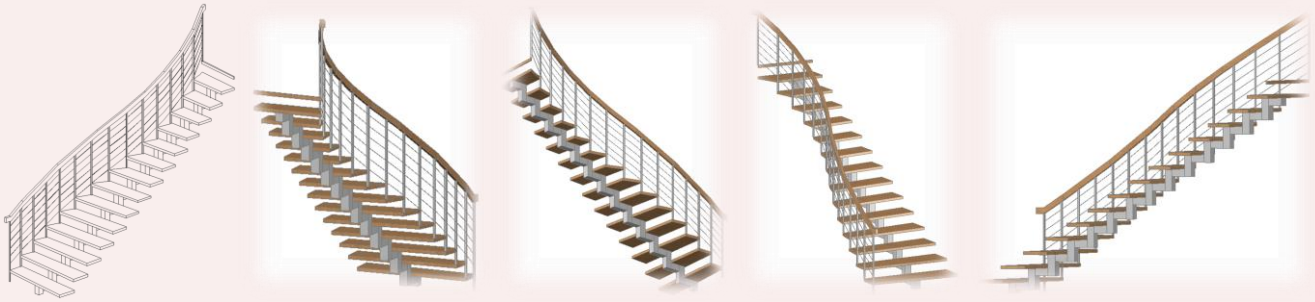
Command for drawing stairs based on free curves is located on **Ribbon ACAD-BAU / Constructions / New stair from Preconstruction**. 3 Polyline objects have to be defined: walking line and both stair edges. We pick all 3 on the same side, where the stairs will start rising.

After confirming all questions, stairs are drawn automatically. To edit the construction, double click it and choose **Settings**. On **Dimensions** tab select **Load stair** from **Load / Save** list. Search for **ACB_Wooden-cross-beam_Wire-rope.R08** stair definition file. Select the **Construction** tab and deselect **Railing right** option.



QUICK 3D ORBIT OF SELECTED OBJECT

Select the object, hold **SHIFT** key on the keyboard and press the **mouse wheel**. By moving the mouse, object is rotated on screen (3D orbit). While orbiting, any Visual style can be active on Visual Styles Toolbar.



When orbiting an object in Realistic visual style, we can check out different material combinations. Use the saved material definition **ACB_Stair_Natural_Wood.lpr** that can be found on **Ribbon ACAD-BAU / Layer / Load Layer Properties** Select **Load** option and look for it in the file list.

PILLARS

Concrete pillar

Profile Selection Display Label

☐ Hollow rectangular profile
☐ Pipe profile
☐ Rectangular profile
☒ Round profile
☐ User defined concrete profile

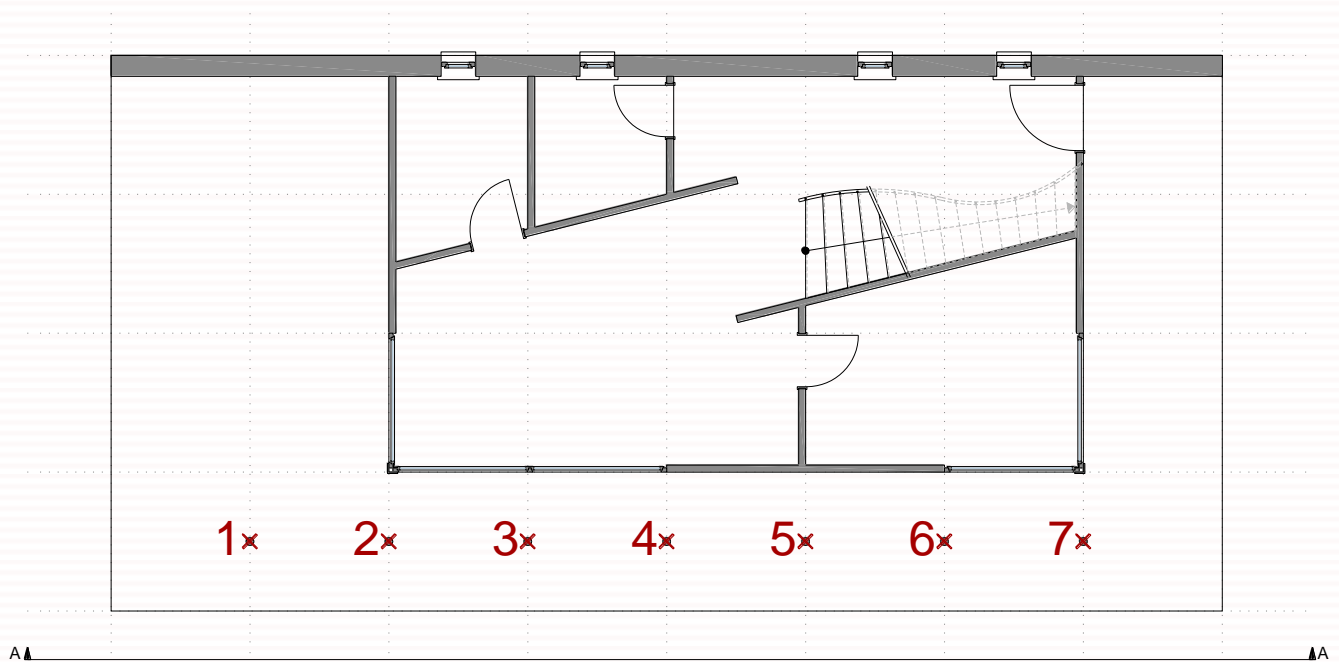
Name	d1[mm]	Layer	Abbreviat
ROM-110	110.00	Concrete profile	PBETON
ROM-220	220.00	Concrete profile	PBETON
ROM-330	330.00	Concrete profile	PBETON
ROM-440	440.00	Concrete profile	PBETON

Height by: Height: To Height Definition:
 Base Height by: Base Height: (relative to Level)
 Alignment: Angle: ☐ Inverse
☒ Profile fixed

OK Cancel

Command for drawing pillars is found on **Ribbon ACAD-BAU / Constructions / Concrete pillar**. Select **Settings** option to open the dialog. Select Round profile **ROM-110**, with Height defined by **BHUF** (Bottom Height Unfinished Floor) Level set to **ACB1**. Alignment is set to **Middle**.

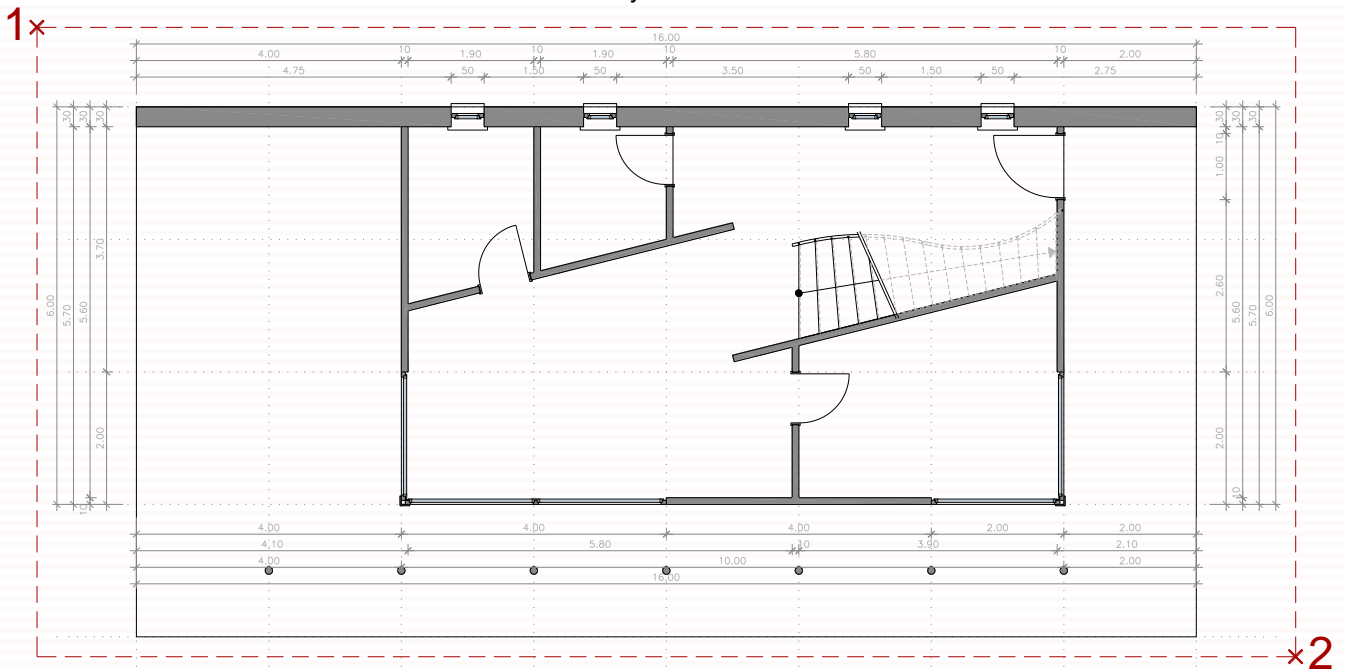
Insert pillars in the middle of the grid lines as shown on the picture. For accurate position use Grid (F7) and Snap (F9).



DIMENSIONS

OUTER DIMENSIONS

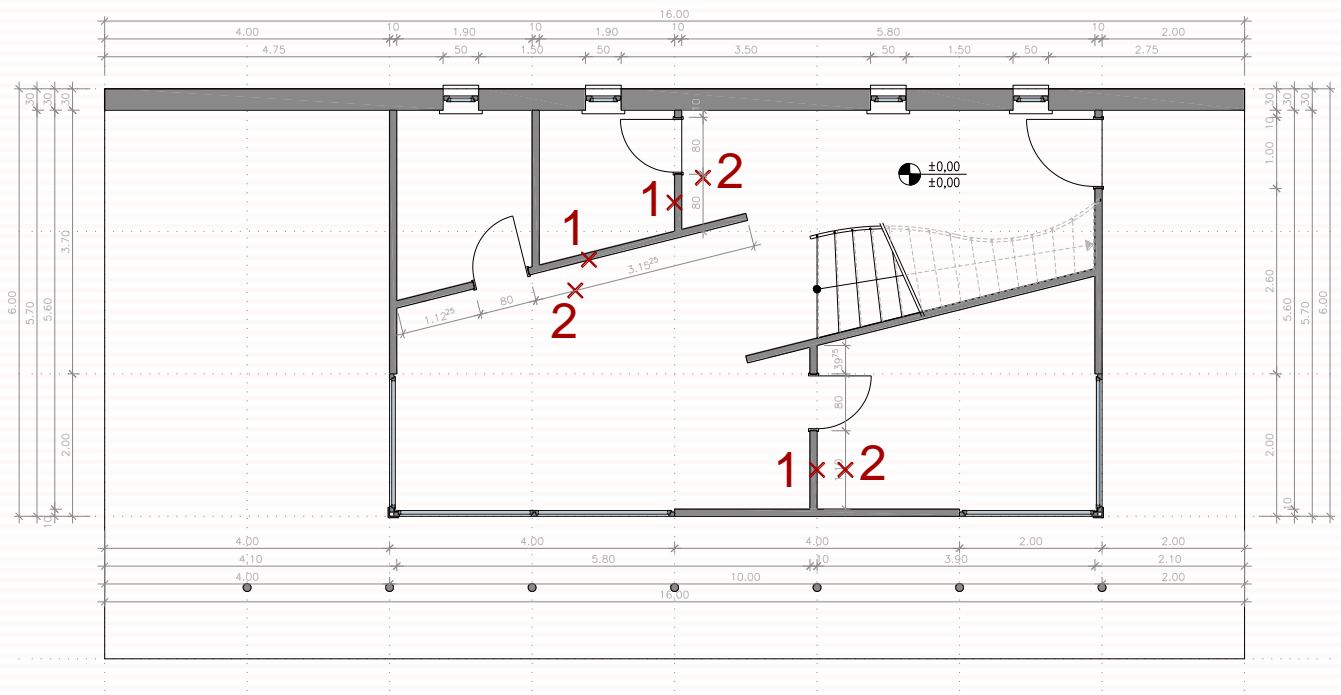
Command for dimensioning can be found on **Ribbon ACAD-BAU / Dimensions / Auto**. Drag a window around the whole model and dimensions are created automatically.



INNER DIMENSIONS

For inner dimensions we want only one dimension line. Right click on Palette title (top of palettes) and select **ACAD-BAU functions** from the list. Palettes with ACAD-BAU commands and macros are now available. Select **Dimensions** palette and choose **Inner Dimensions** command.

Select command **Ribbon ACAD-BAU / Dimensions / New Object dimension**. Pick the inner wall and then click to set the distance from the object. Ortho (F8) has to be OFF. Don't forget to load **Outer_Dimensions** from the palette, when interior dimensioning is finished.

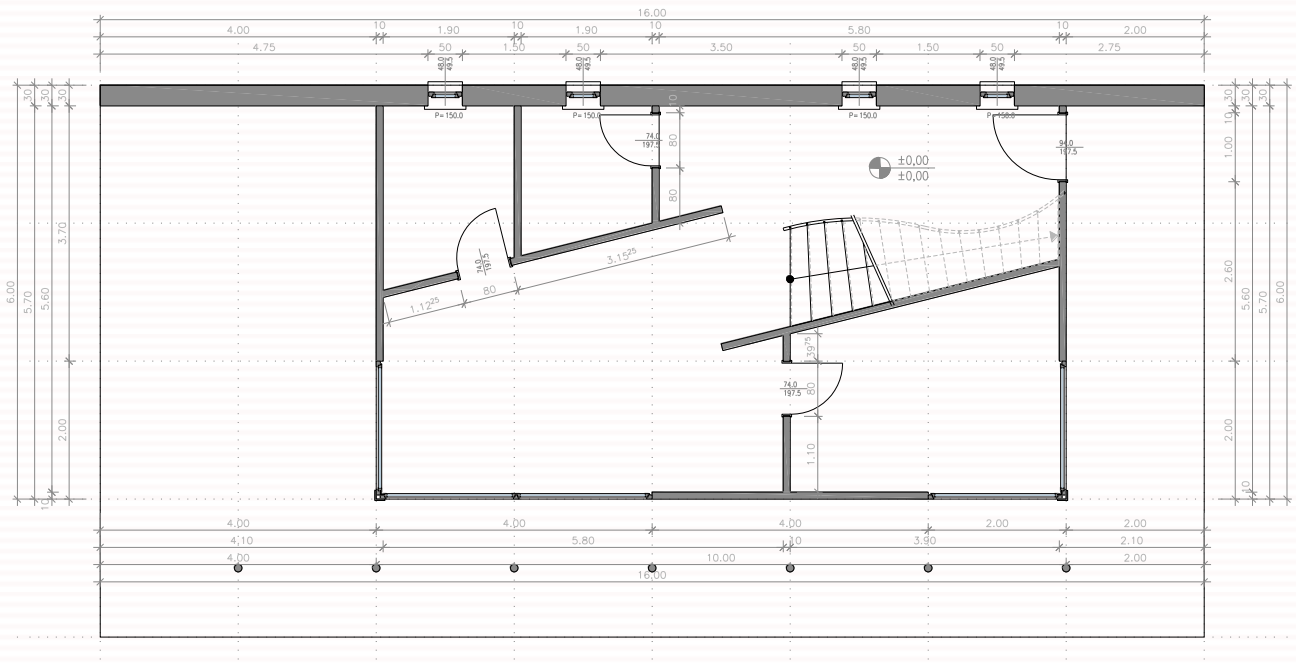


HEIGHT NOTATIONS

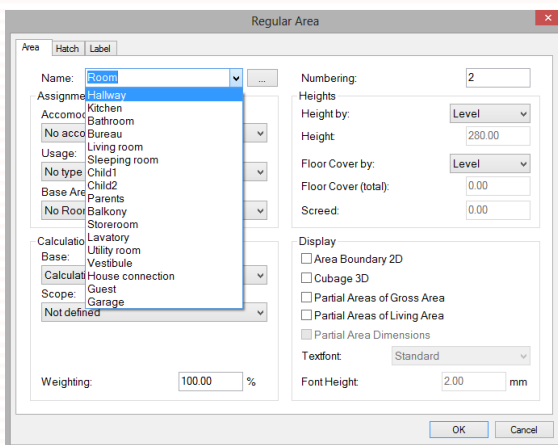
Select command **Ribbon ACAD-BAU / Dimensions / New Height Notation**. Pick the location and take care that Ortho (F8) is OFF. While inserting also **Settings** are available to change to a different Height Notation symbol. **Plan THFF** (Top Height Final Floor) uses the plan symbol and final floor height, **Plan THUF THFF** uses heights of Unfinished Floor and Final Floor. You can modify the size of the symbol by using **Scale by Input** and typing preferred scale in the Scale box.

LABELS

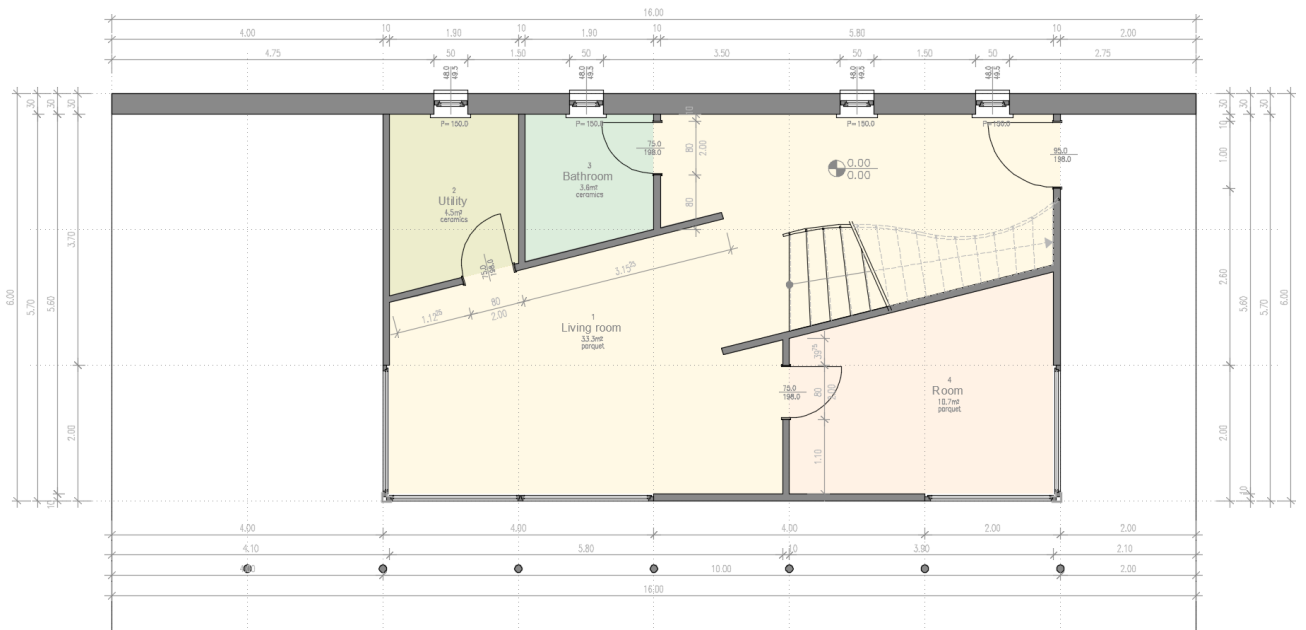
Text labels need only to be switched on for all objects where we need them. To select multiple instances of same object at once, select 1 object, then right click and **Extend Selection / Same Objects**. Do this for the small upper window. Again use shortcut menu and select **Edit Windows**. On **Label** tab select **Add Label** and choose **AX-carpenter**. Repeat the procedure for doors and select **AXIS-clear**.



ROOMS



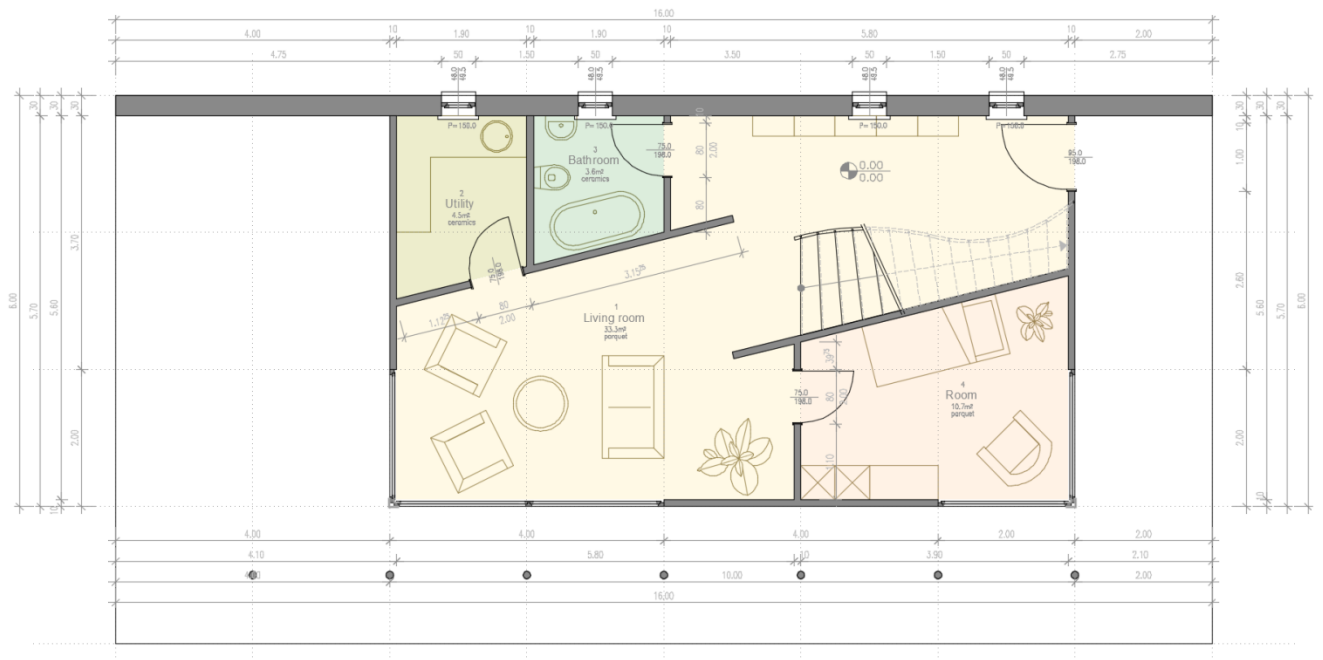
Command for room creation is found on **Ribbon ACAD-BAU / Calculations / Rooms**. Choose options **Create** and **Automatic** to automatically insert 4 room labels with corresponding data. Double click the label to edit data. Select right room name in the **Name** list on **Area** tab (can also be typed in) and optionally type in the final floor in **Text line 1** on **Label** Tab. Label position can only be changed by grips. Rooms can also be hatched or colored. On **Hatch** tab select **ROOM-filled** in **Hatch** list and select the color. This hatch has a predefined transparency so that all elements in the room (symbols, dimensions, labels...) are still clearly visible. Switch on also hatching of **Passages** and subtract **Window Sills**. For manipulating multiple rooms, use **Extend selection** command that was mentioned in previous paragraph!



SYMBOLS

2D SYMBOLS

Symbol library is located on Tool palettes. Right click the Tool palettes title (on top) and then select **ACAD-BAU 2D Symbols**. Look for **Living**, **Kitchen** and **Sanitary** tabs. Insert symbols from the palette into the drawing. All symbols are dynamic blocks so we can change the way they look after they are inserted. Use multifunctional grips or Properties palette (CTRL+1) to make changes.

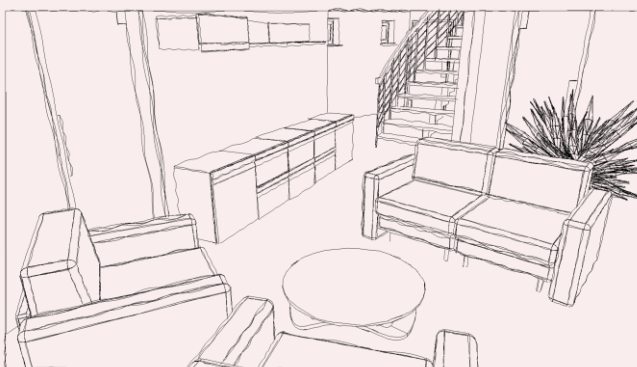


3D SYMBOLS

Also the 3D symbol library is located on the Tool palettes. Right click the Tool palettes title (on top) and then select **ACAD-BAU 3D Symbols** or **ACAD-BAU 3D Furniture** to choose among variety of 3D Dynamic blocks. Before inserting the symbol, select **3LIBRARY** in Block-Insertion-Layer list on ACB Control bar. Take care of Z insertion point. The easiest way is by using the Properties palette (CTRL+1) and **Position Z** field. Materials of the furniture symbols can be changed using the bottom part of the Tool palette or by loading LPR files with **Ribbon ACAD-BAU**

CAMERA VIEW

Select **Camera** command on **View Toolbar**. Set camera location and target point in plan view and then Exit. Select the camera and set **Z** coordinate for location and target in Properties window (CTRL+1). Change field of view with triangular grips. Activate the camera view by selecting the **Camera1** on the **View control** list on View Toolbar. Activate any of the visual styles on Visual Styles Toolbar or render the view. Exercise **Phase 11a_3DSymbols** is rendering ready.



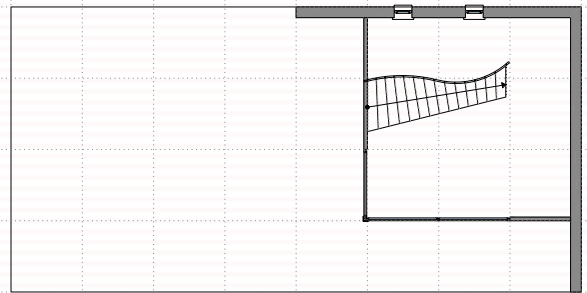
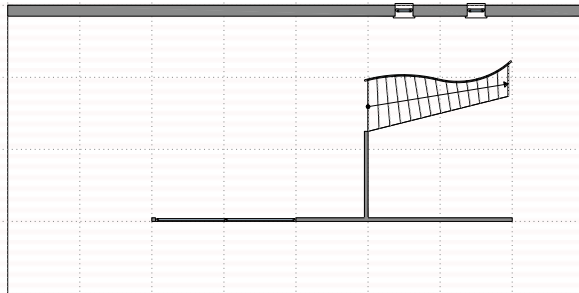
/ Layer / Load Layer Properties.

LEVELS

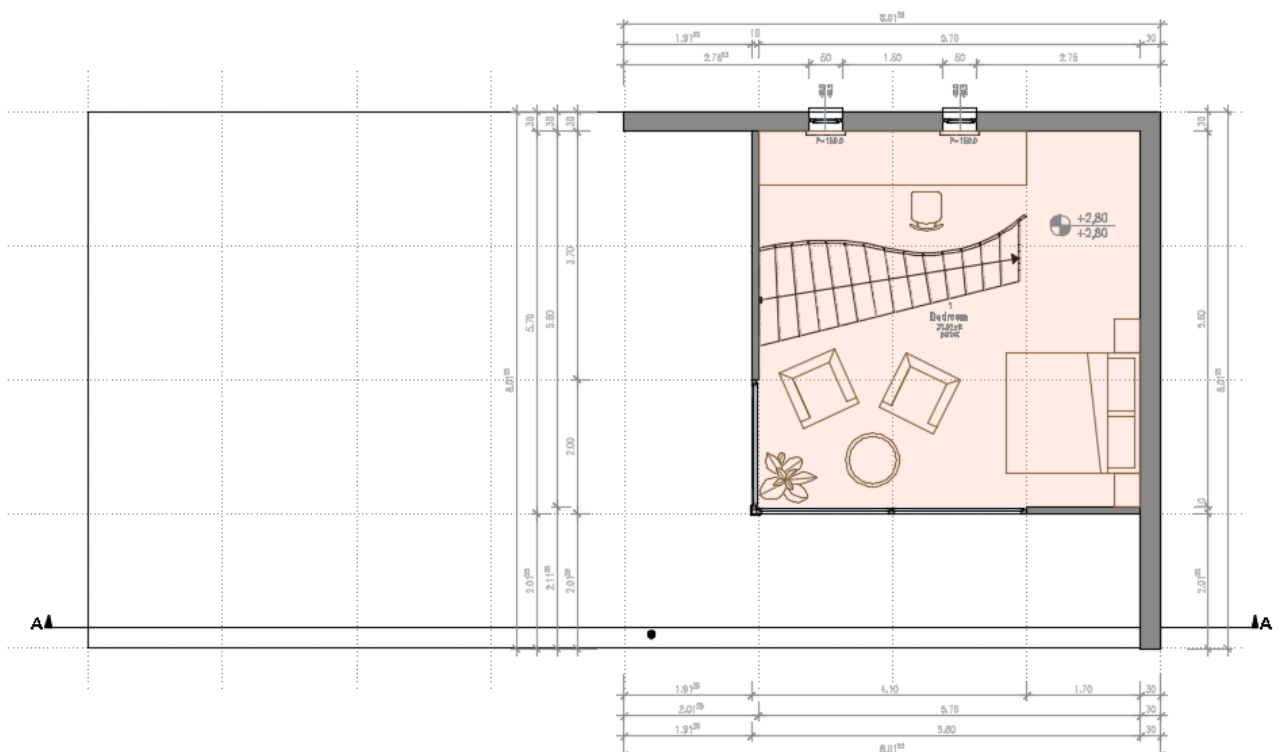
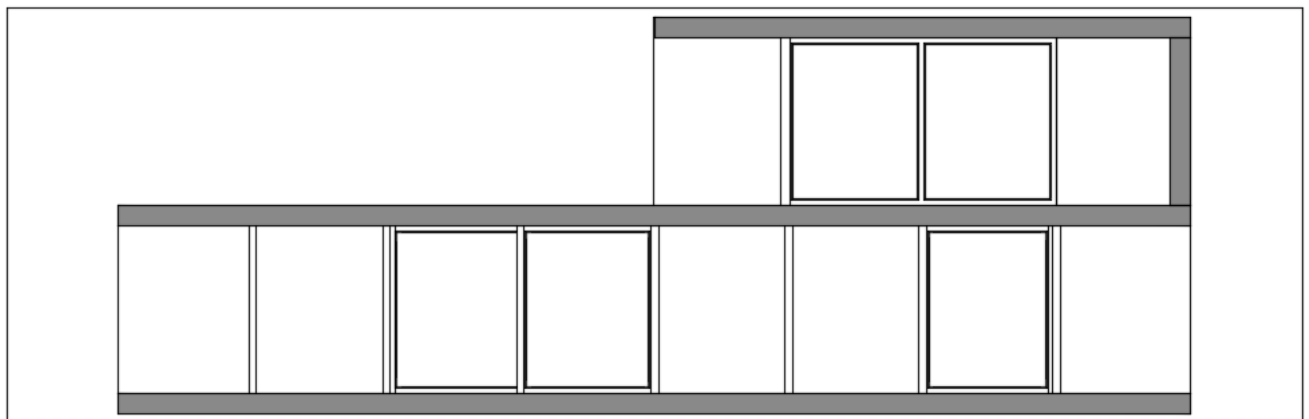
Level	THUF	LH
+03 Third floor	840.00	280.00
+02 Second floor	560.00	280.00
+01 First floor	280.00	280.00
+00 Ground floor	0.00	280.00
-01 Cellar	-260.00	260.00

Elements can be copied among levels with command **Ribbon ACAD-BAU / Tools / Copy on Level**. Select the Floor object and copy it to **First** and **Second floor** (hold **CTRL** for multiple level selection). Repeat the command and copy the thick wall, right 2 windows, left corner window and bottom horizontal and middle vertical non-supporting wall to **First floor**. Switch to First floor by clicking **+01 Floor** on **ACAD-BAU Control bar**.

Shorten the supportive wall by half and mirror it by 45°, to get the vertical part. Change both non-supportive walls with grips to connect them with supportive wall and make a nice corner connection. Move both Corner windows grips to corresponding position on the raster. Pick the floor object and right click to select **Boolean operations** from shortcut menu. Select **Subtract** option and pick on stairs. Stairs are subtracted from floor. It is visible in the section view (move the section line over the stairs).



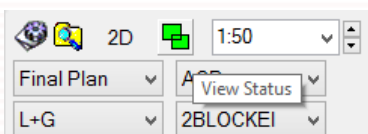
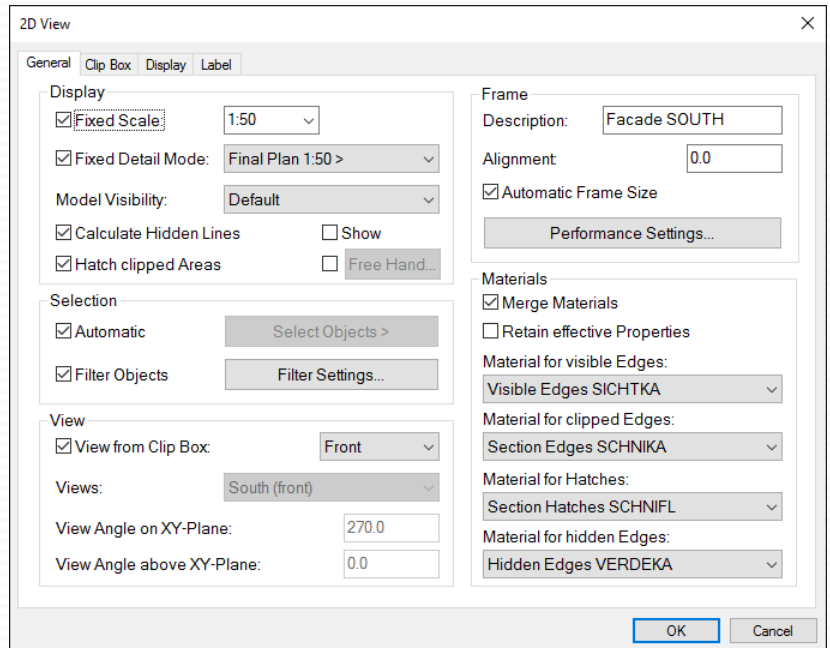
Switch to **+02 Second floor** and shorten the floor object by half to the raster line. Edit the First floor to add dimensions, labels, symbols...



DEFINING VIEWS

Move the section line of current view to cross the stairs. Double click the view and rename it to **Section A-A** in **Description** filed on **General** tab. We need some additional views to insert in Layout and print. Create 3 more views as described in the Views section and place them beside the existing view. Set next properties for the 3 new views:

- Clip Box covers whole model, double click – General tab: Description: **Façade SOUTH**, Clip Box tab: Name **FS**
- Clip Box covers whole model, double click – General tab: Description: **Façade WEST**, view from Clip Box: Left, Clip Box tab: Name **FW**
- Clip Box covers whole model except on Left side, where it crosses bathroom, double click – General tab: Description: **Section B-B**, view from Clip Box: Left, Clip Box tab: Name **B**
- Clip Box covers whole model, double click – General tab: Description: **Axonometry**, view from Clip Box is Off, Views list: Isometry South-West

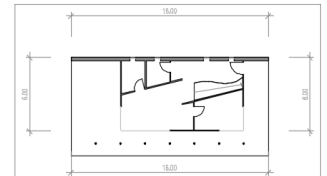
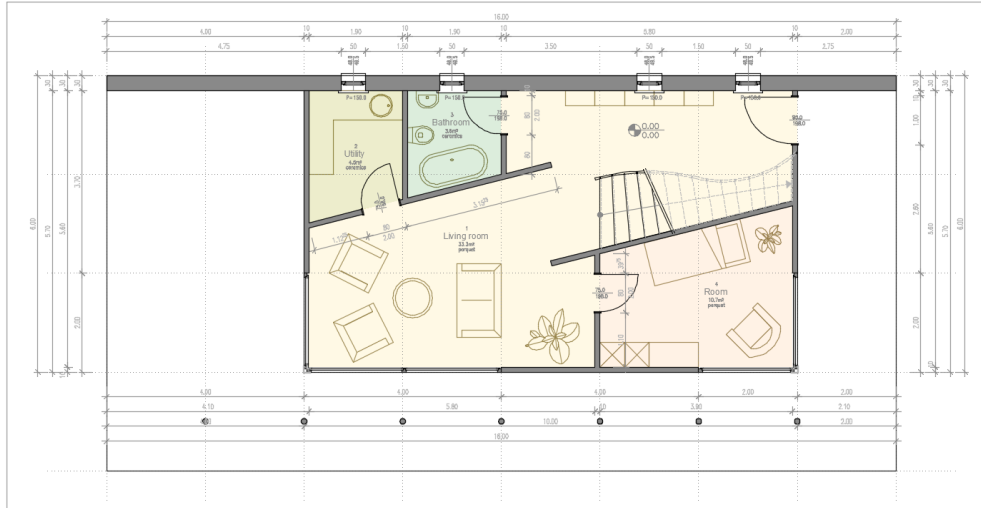


After all views are defined, switch them off by clicking the green icon **View Status** on **ACAD-BAU Control bar**. Icon changes to red. Clicking the icon again would switch all views back on.

LAYOUT

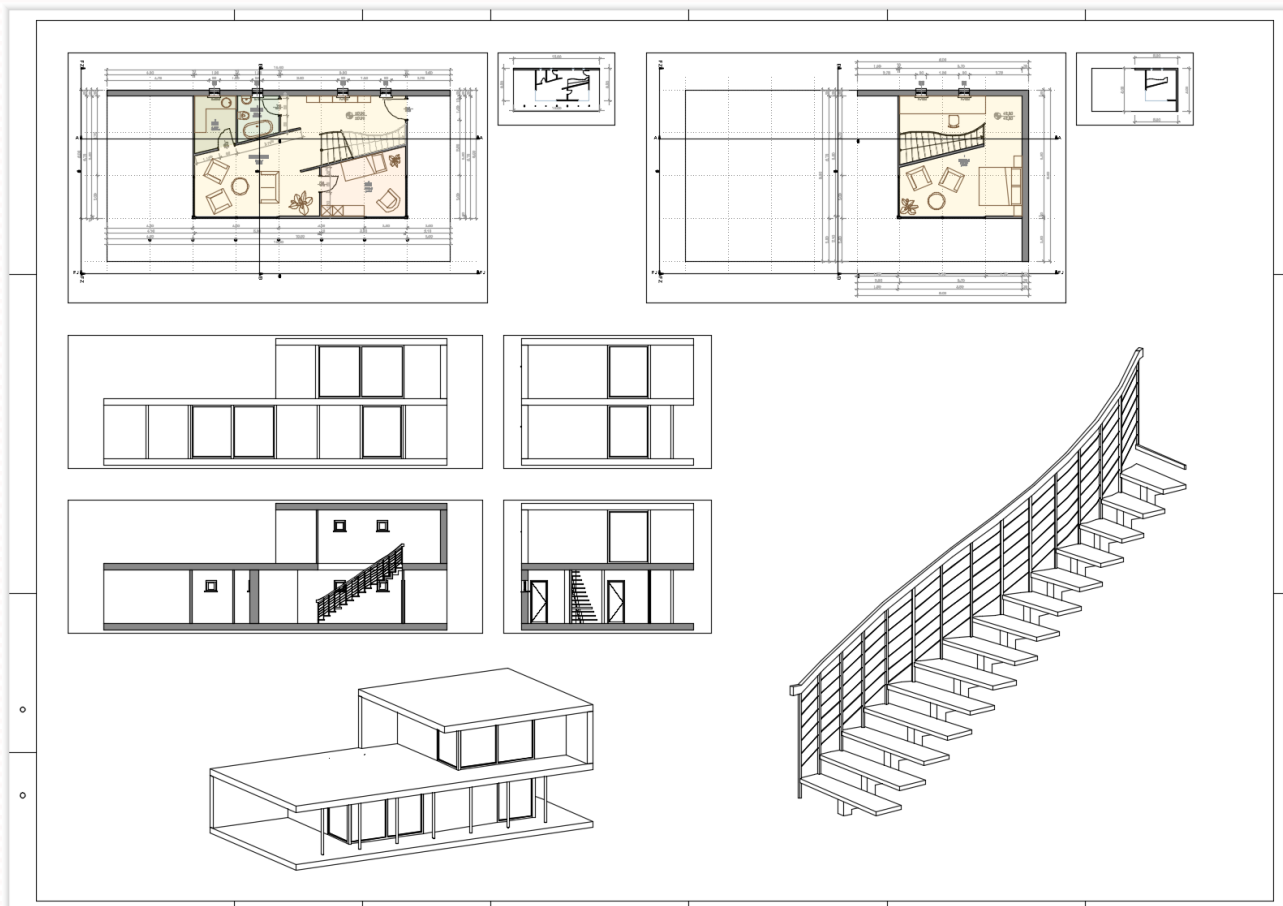
INSERTING PLANS

Switch all layers on by **Ribbon ACAD-BAU / Layer / All on**. Switch to Layout **A0** and start inserting plans with command **Ribbon ACAD-BAU / Views / New/Edit 2D Viewport**. Select **Insert** Option and place **Ground floor** in **1:50** scale. Repeat the insert and use same floor with **1:200** scale and change Level Visibility to **L+G-Symbols**. Plan is inserted in schematic way without symbols and adopted to 1:200 scale. Insert the **First floor** with both scales too.

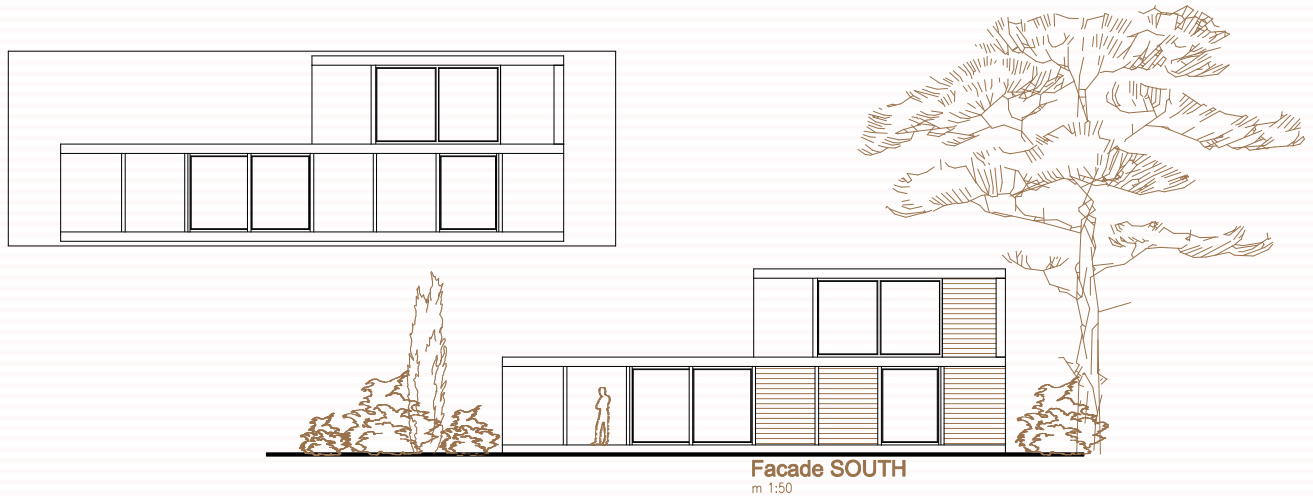


INSERTING VIEWS

Command for inserting defined views is found on **Ribbon ACAD-BAU / Views / New Layout View**. Select **Façade SOUTH** from the list, position it and define 0 rotation angle. Insert other 3 views in same way. Double click axonometric view and switch off **Show Frame** on **Display** tab. Make a copy of this view with Copy command. Double click it and change **Scale** to **1:10** on **Display** tab and **Model Visibility** to **Only all Stairs** on **General** tab.



Views in Layout can be processed. If we explode them, we can also delete lines, but in this case associativity with the model is broken. Add symbols from Tool Palettes **Site plan** and **Site elevation** (ACAD-BAU 2D Symbols group), hatch the view with classic or gradient hatches, add labels...

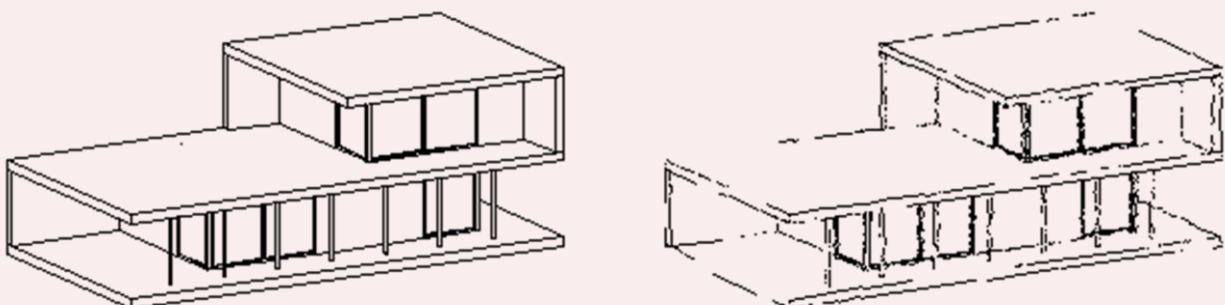


3D model can also be used for visualizations. Renderings can be made in AutoCAD or transferred to 3D Max for more outstanding results. Model export is possible with command **Ribbon ACAD-BAU / Views /Export**. Load appropriate settings called **3Dmodel MAX.r19** with Load Export Settings in Load/Save list.



View as sketch

Each view can be displayed as hand drawn sketch. Double click the view and activate **Free Hand** on **General** tab. Pick Free Hand button and **Load Freehand Style** from the **Management** list. Select **Tutorial.r20** file. We can also play on with different settings in the dialog.



ADDITIONAL INFORMATION

Tutorial for ACAD-BAU is only a short introduction into work with this powerful BIM program. For testing you need basic knowledge of 2D AutoCAD drafting. On the Tool Palette you can find this manual and final DWG if you want to take a look at properly finished exercise. Also all intermediate steps are saved, so you can start working on any tutorial phase.

Of course, ACAD-BAU is capable to do much more. Additional knowledge is available by:

- **COURSES**

Visit ACAD-BAU course in our ATC (Autodesk Training Center) Course lasts 3 days – 5 school hours each day. Each attendee gets a brochure and set of exercises.

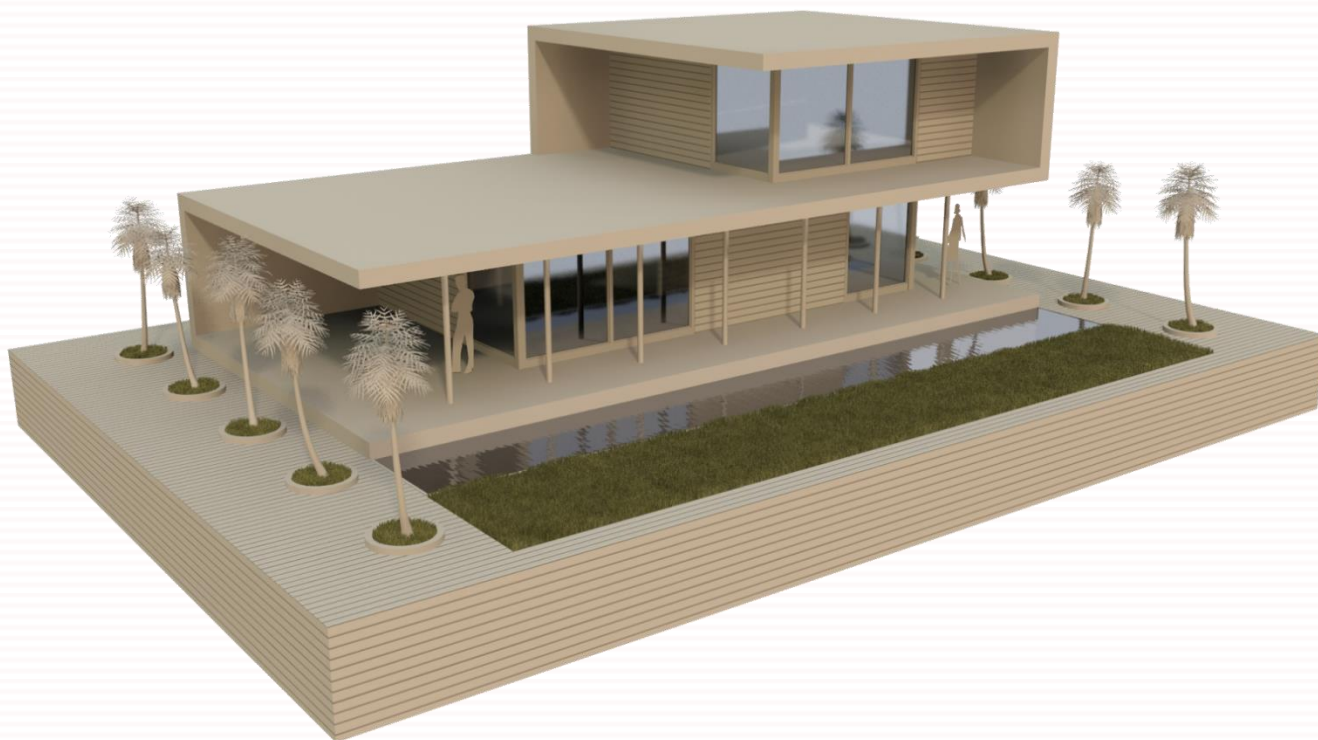
- **INTERNET PAGE**

CadToBim internet page offers some more information about ACAD-BAU. <http://www.cadtobim.com/acad-bau.html> or BIM: <http://www.cadtobim.com/what-is-bim.html>

To become a better ACAD-BAU user, also AutoCAD knowledge is important. Additional AutoCAD help can be found here: <http://www.cadtobim.com/autocad-tricks.html>. You can also improve your knowledge with courses, instructions or standardizations we make in our company. Courses useful for general ACAD-BAU use:

- AutoCAD 3D
- AutoCAD advanced
- AutoCAD rendering

For all additional information about purchase, support or BIM introduction refer to:
Vesna Križnar: vesna.kriznar@arhinova.si or phone: 00386 (0)41 500 764



ENJOY USING THE PROGRAM!