

ArCADia SYSTEM

User Manual

2016-09-20

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As a result, we would like to draw your attention to the fact that we cannot bear legal responsibility for any resulting problems. We would be grateful should you notify us of any possible errors.

2.INTRODUCTION

Introduction

2.1. System ArCADia BIM description

The ArCADia BIM system is a tool for supporting project work in the construction industry. ArCADia is modular software allowing to design the building from scratch, in objects, that is the architectonic design, through gas, water-sewage, electric or heating installations, up to creating reinforcement drawings in the slab or the pole or improving the distribution board design. Apart from the building itself the software allows to equip it with necessary utilities, connect it to external sewage, electrical or telecommunication networks. An option to introduce all systems, or networks at the building, enables verification of collisions both in a given trade and between trades. On the basis of designs, (projections), additional views are created automatically: sections, axonometries, expanded views, profiles of systems etc. Also, lists are automatically introduced to the project and they can be exported in RTF or CSV formats or transferred to the Ceninvest cost estimate software. In addition, ArCADia assists in drawing escape and fire fighting plans. At surveying, it allows to connect the range-finder that introduces projections already at in the measured building.

Projects made in the ArCADia BIM system are intelligent three-dimensional models containing the information in every single element which is used for calculations, selection of elements, specifications, or transferred to other programs. The thermal model of the building, created automatically on the basis of the architectonic design, is transferred to the ArCADia-TERMO software with one icon in order to prepare power certificates and thermal audits. Connection of ArCADia-ARCHITECTURE module and R3D3-3D Frame software provides an excellent tool for cooperation between the architect and the constructor. All this happens on the basis of one model.

Projects can also be imported and exported in IFC format, which enables combining work of designers using various applications also offered by other companies (communication with software: Revit, Allplan or ArchiCAD). Transferred projects may be further improved e.g. by other trades, collisions may be verified.

The ArCADia BIM system works on various graphic engines: ArCADia LT, ArCADia (PLIS), Autocad

2.2. Using the ArCADia BIM system

You can work with the ArCADia BIM system in several different ways, depending on whether the project has been started from a scratch or, for example, the materials have been received in the form of a digital file created in another application.

- If work with project has been started using an empty file, the first step should involve an insertion of a building (see section Buildings). Then, using the function of the relevant trade module, you draw the project.
- If you receive a project created with the use of other CAD application, for example AutoCAD or ArCADia-INTELLICAD, it should be treated as a base and after defining the building view and level it should be "outlined" with system functions.
- If the project was downloaded from ArCon, it is automatically converted into ArCADia-ARCHITECTURE elements, and such a project should be elaborated through the definition of

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wall layers, adding symbols to windows and doors, i.e. you must proceed as in case of work with the next stage of project created in industry-specific module.

- If you received the project in *IFC* format created with Allplan, Revit or ArchiCAD, proceed in the way similar to ArCon project. The imported project can be supplemented by further trades.

If you use ArCon project or if you uploaded files in *IFC* format, there is no need to create level, because they are imported along with other project elements (walls, windows, door, etc.). In such case, first of all, it is necessary to modify existing elements, e.g. define walls' layers, window or door symbol and add other module's functions to the project.

NOTE: This manual describes only the elements concerning the whole management system, libraries and creation of the project. Particular options of trade modules are described in their help files.

2.3. Construction of the system

Features of ArCADia BIM are divided into modules: basic, ArCADia-START (basic options of ArCADia BIM) and the branch modules: ArCADia-ARCHITECTURE, ArCADia-3D MAKER, ArCADia-IFC, ArCADia-CEILINGS TERIVA, ArCADia-ESCAPE ROUTES, ArCADia-ELECTRICAL INSTALLATIONS, ArCADia-POWER NETWORKS, ArCADia-DISTRIBUTION BOARDS, ArCADia-TELECOMMUNICATIONS NETWORKS, ArCADia-WATER SUPPLY INSTALLATIONS, ArCADia-SEWAGE INSTALLATIONS, ArCADia-SEWAGE SYSTEMS, ArCADia-GAS INSTALLATIONS, ArCADia-EXTERNAL GAS INSTALLATIONS, ArCADia-HEATING INSTALLATIONS, ArCADia-REINFORCED CONCRETE SLAB i ArCADia-REINFORCED CONCRETE COLUMN and ArCADia-SURVEYOR.

Below, there is a breakdown of options in relation to placing them on ribbons.



Fig. 1. *System* ribbon

The ribbon grouping basic tools of the ArCADia BIM system that can be found in this Manual and under the Help icon on the *System* ribbon. The *Project* group contains project management options. The *View* group manages the project views, the *Libraries* group contains libraries of elements and materials available in the program. In the *Insert* part, there are 2D and 3D objects, introduction of the line and drawing tables. The documents comparison and integration options are grouped in the *Comparison* part. The *Communication* logic group is a special group of options, because its appearance depends on the owned program licences. Constant elements of the group are:

XML export – export of the project to the XML format.

Project pack – packs templates, objects and textures not being part of the standard library to the folder that should be transferred along with the project. The catalogue will have the same name and will be placed in the same location as the project. A detailed description of the functions is included in the *Saving the project with the template* chapter.

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Project presentation and Project presentation data - ArCADia-3D MAKER module options, saving the building model along with a browser (or without it) allowing watching it regardless of the ArCADia LT software. A detailed description of the functions is included in the *Project presentation saving* chapter.

Termo Export – export of the building project to ArCADia-TERMO software (a broader description of the function is in the help file for ArCADia-TERMO software). This option is visible, if the computer has the ArCADia-TERMO module installed, and ArCADia LT is a 32-bit version.

IFC Import, IFC Export - ArCADia-IFC module options enabling loading the building model from files in IFC format (e.g. from the Revit or ArchiCAD software) and exporting the project to this format.

Other communication options (*OBJ Export, Initial drawing export to R3D3-3D frame*) belong to ArCADia-ARCHITECTURE licences and are described in the help file for this program.



Fig. 2. *Architecture* ribbon

The *Architecture* ribbon contains options of the ArCADia-START and ArCADia-ARCHITECTURE trade module. After installing the software, for over 30 days, all options are available. If at that time the license for this product is not installed, the ribbon will be disabled. Broader information, description of the versions and all options can be found in the help file for the ArCADia-ARCHITECTURE module placed under the last icon of the ribbon.

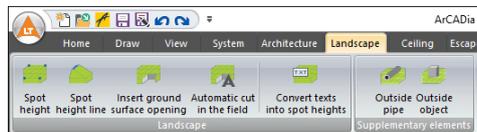


Fig. 3. *Landscape* ribbon

The *Landscape* ribbon contains options creating the land form. These options are available in licenses of the ArCADia-START module and are described in the help file ArCADia-ARCHITECTURE module.

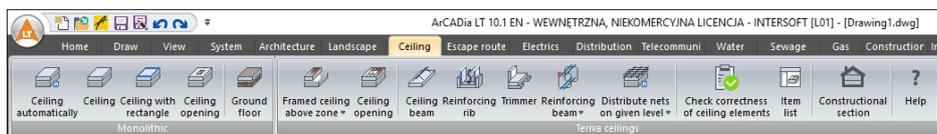


Fig. 4. *Ceilings* ribbon

The *Ceilings* ribbon includes options concerning inputting monolithic ceilings and ArCADia-CEILINGS TERIVA. The first part of ribbon has been moved from the *Architecture* ribbon, and their description is in the help file, while the other one is added. Any information on the ArCADia-CEILINGS TERIVA option can be found in the help file to this module.



Fig. 5. *Escape* ribbon

Introduction

The *Escape* ribbon contains options of the ArCADia-ESCAPE ROUTES that are installed along with the program in the demo version. Description of the function is in the help file for the module.



Fig. 6. *Electrics* ribbon

The *Electrics* ribbon contains options of modules: ArCADia-POWER NETWORKS, ArCADia-ELECTRIC INSTALLATIONS and ArCADia-ELECTRIC INSTALLATIONS PLUS that are installed along with the program in the demo version. Description of the function is in the help file to the modules.



Fig. 7. *Distribution* ribbon

The *Distribution* ribbon contains options of the ArCADia-DISTRIBUTION BOARDS trade module that are installed along with the program in the demo version. Description of the function is in the help file for the module.



Fig. 8. *Telecommunication* ribbon

The *Telecommunication* ribbon contains options of ArCADia-TELECOMMUNICATION NETWORKS module that are installed along with the program in the demo version. Description of the function is in the help file for the module.



Fig. 9. *Water* ribbon

The *Water* ribbon contains options of the ArCADia-WATER SUPPLY SYSTEM that are installed along with the program in the demo version. Description of the function is in the help file for the module.

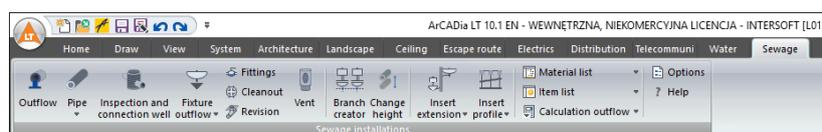


Fig. 10. *Sewage* ribbon

Introduction

The *Sewage* ribbon contains options of ArCADia-SEWAGE INSTALLATIONS and ArCADia-SEWAGE SYSTEMS that are installed along with the program in the demo version. Description of the function is in the help file to the modules.



Fig. 11. *Gas* ribbon

The *Gas* ribbon contains options of ArCADia-GAS INSTALLATIONS and ArCADia-EXTERNAL GAS INSTALLATIONS that are installed along with the program in the demo version. Description of the function is in the help file to the modules.

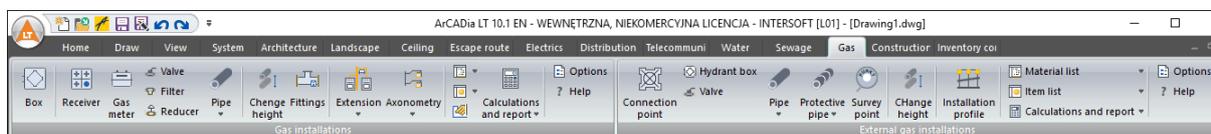


Fig. 12. *Construction* ribbon

The *Construction* ribbon contains options of ArCADia-REINFORCED CONCRETE POLE that are described in the help file of the module, as well as ArCADia-REINFORCED CONCRETE SLAB whose options are described in its help file.



Fig. 13. *Inventory control* ribbon

The *Inventory control* ribbon contains options of the ArCADia-SURVEYOR module that are described in the help file for the module.

NOTE Tables with module options are at the end of the manual in the *Command Tables* chapter.

3. BASICS OF APPLICATION OPERATION

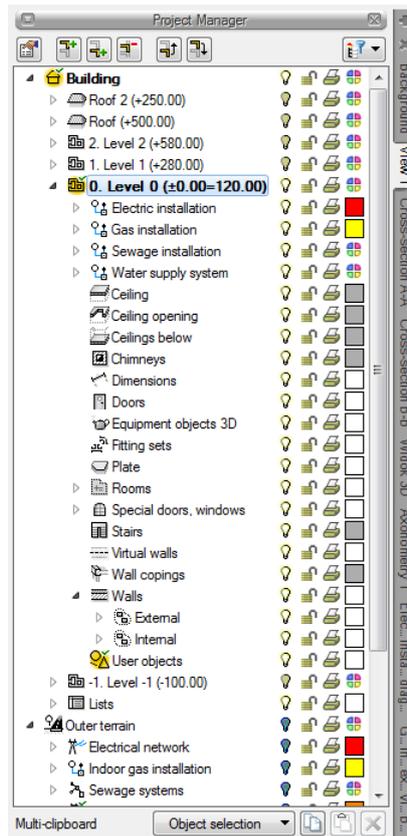
Basics of Application operation

3.1. Project Manager

The *Project Manager* allows managing all the ArCADia software elements: buildings, levels, electric, gas and sewage installations, telecommunications networks, etc.

Activation:

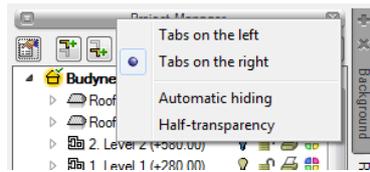
- *System* ribbon => logical group *Show/Hide* =>  *Show/Hide the Project Manager*



Drawing 1. *Sample project Project Manager window*

The *Project Manager* window changes along with the creation of the project, additional buildings, system designs, networks and new views are added in tabs, with each subsequent element the windows becomes more developed. This may however get in the way in the course of designing, the window may obscure the drawing or the much needed workspace, therefore, depending on the option selected, the *Project Manager* windows may be a standard view window, a semi-transparent window or it may be hidden automatically until one of the tabs is clicked. This selection is made from the manager menu available after right clicking the *Project Manager* bar.

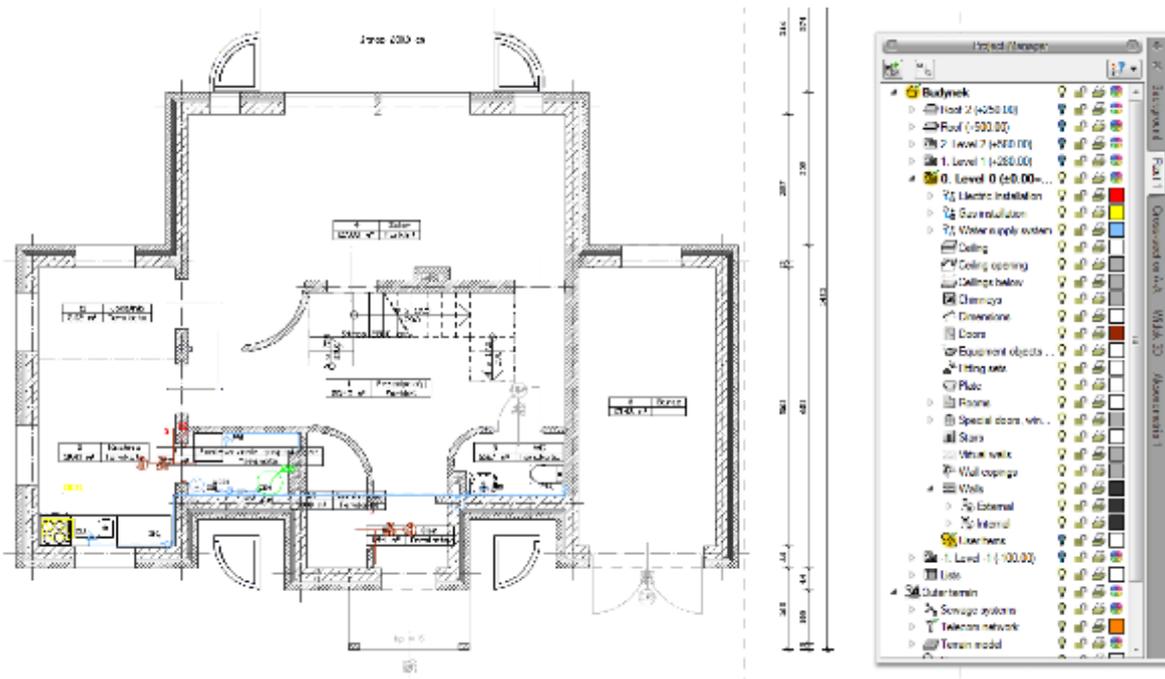
Basics of Application operation



Drawing 2. Visibility options of the Manager window

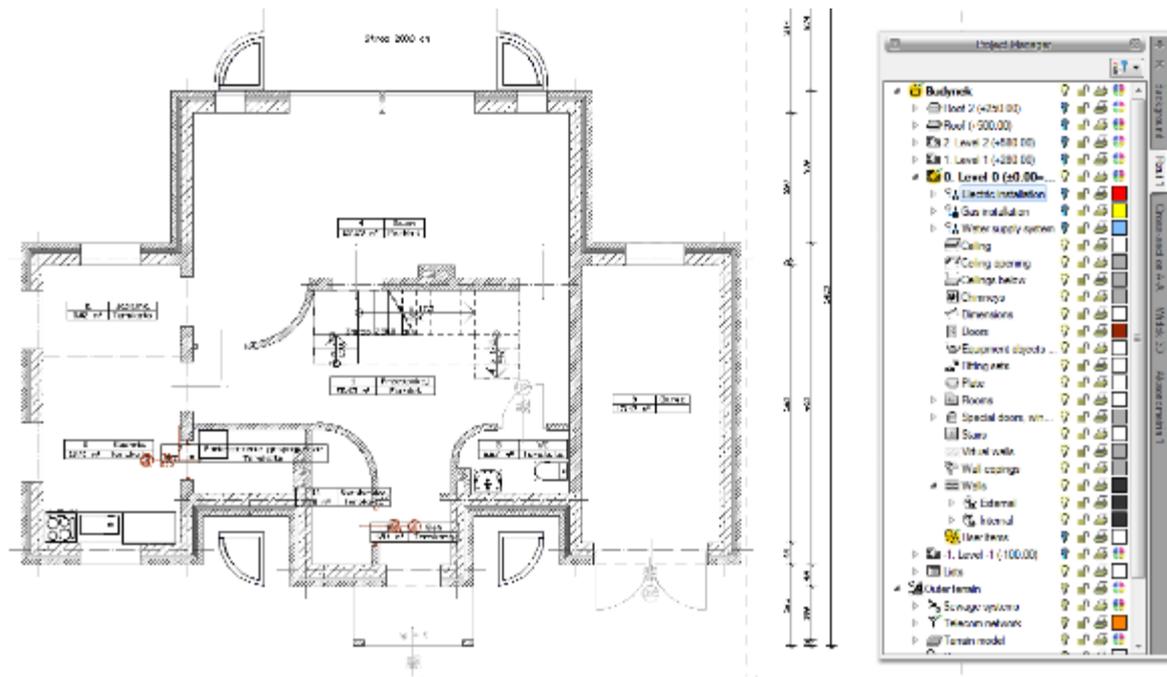
The *Project Manager* allows setting the visibility, drawing and printing colour. Each building is divided into levels and each level is made up of certain elements, i.e. the installations, walls, columns, chimneys, stairs window and door joinery, etc. These elements may be joined and blocked, both in groups and individually. This means that e.g. rooms descriptions or ceilings may be turned off in a particular level to ensure drawing transparency.

The software also features *Trade filters* to enable working in a team of several designers from different branches using the same project. These filters allow to quickly enable or disable all the elements of a particular branch. For example once the electric installation is drawn all the architectural elements may be disabled or just the opposite – leave the architectural elements enabled and disable all the electric installation items. The Branch filter  button is located in the *Project Manager*.



Drawing 3. Level projection with all the items visible, i.e. the architecture and sewage installation trade.

Basics of Application operation

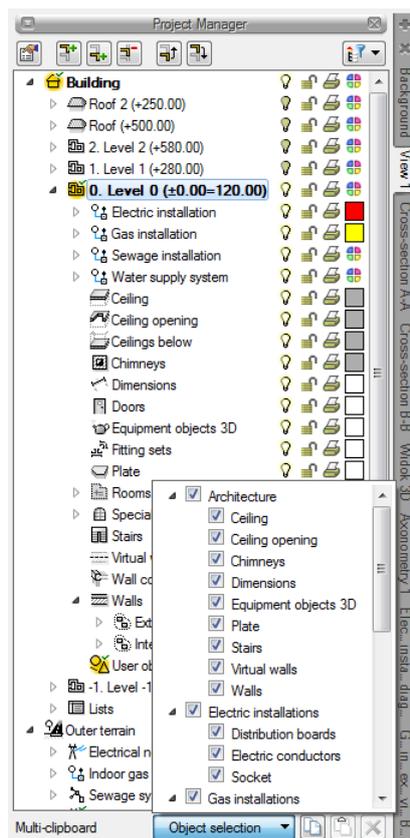


Drawing 4. Level projection with sewage system objects turned off.

NOTE Trade filters are available in views: Projection, section and 3D View

The *Project Manager* also enables copying selected items or branches. The *Multi-clipboard* also enables selecting an item from one or several branches

Basics of Application operation



Drawing 5. List of branches and elements of the building that can be copied.

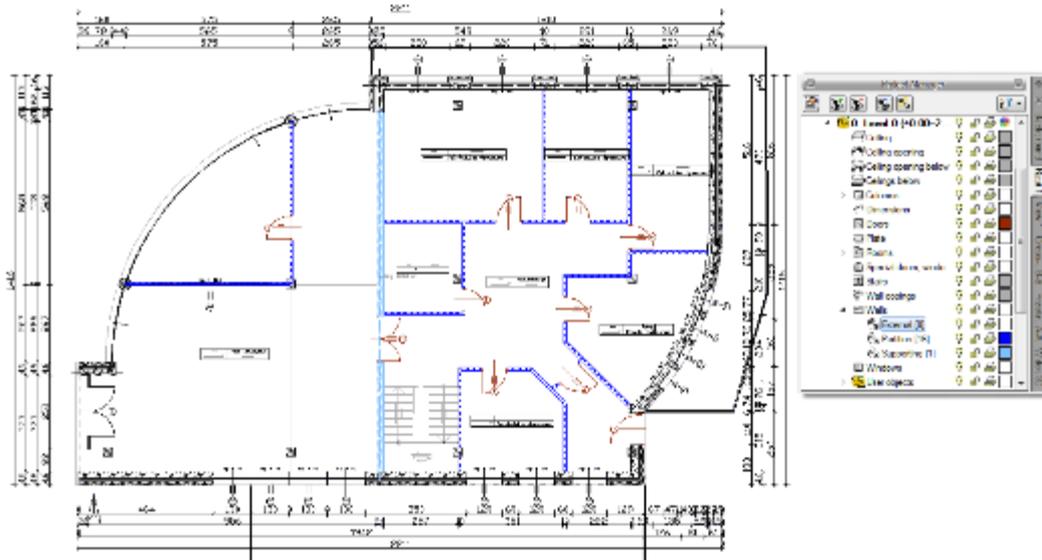
Another option of the *Project Manager* is the ability to define user's groups. These groups help manage the drawing. They enable e.g. blocking or turning off part of the information included in a view, 3D view or cross-section.

A description of the options available in the *Project Manager* for level elements (walls, joinery, ceilings, roofs, electric, gas, sewage installations, etc.) defined as groups or subgroups.

	<i>Group properties</i>	Opens the <i>Group properties</i> window.
	<i>Add subgroup</i>	Adds a subgroup of items to the selected group e.g. group of walls.
	<i>Remove group</i>	Removes the selected subgroup.
	<i>Add selected objects to group</i>	Adds the selected object/objects to the selected subgroup.
	<i>Select objects</i>	Selects all the objects in a group or subgroup, e.g. all the windows in a particular level.

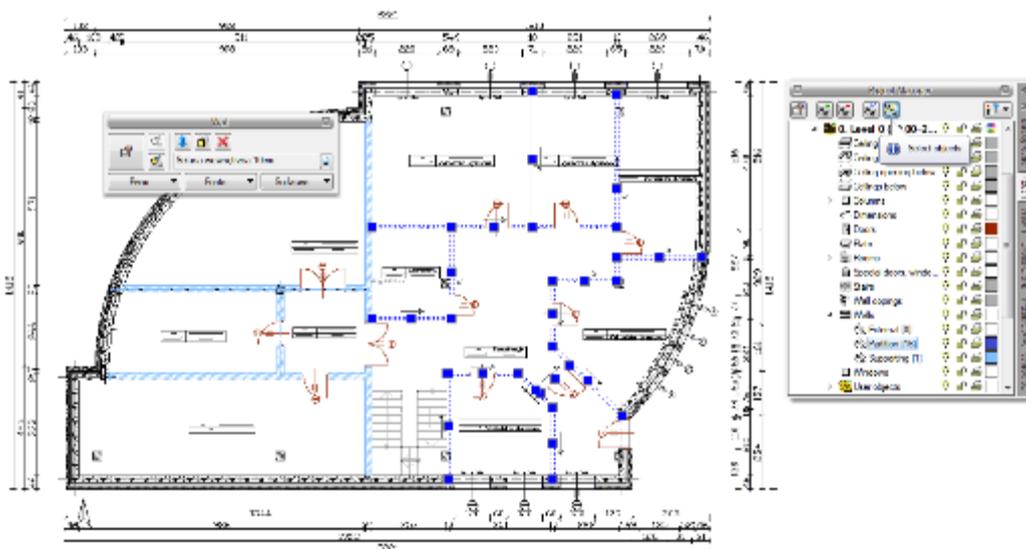
Basics of Application operation

For example: you draw a building, starting from the ground floor and the external contour. Then you define walls with a particular type and save it in the *External* group. The next step is to introduce walls to be added to the *Supporting* and *Partition* groups. In order to facilitate work and ensure transparency of the example the groups are assigned different colours.



Drawing 6. Example of the project with walls divided into groups

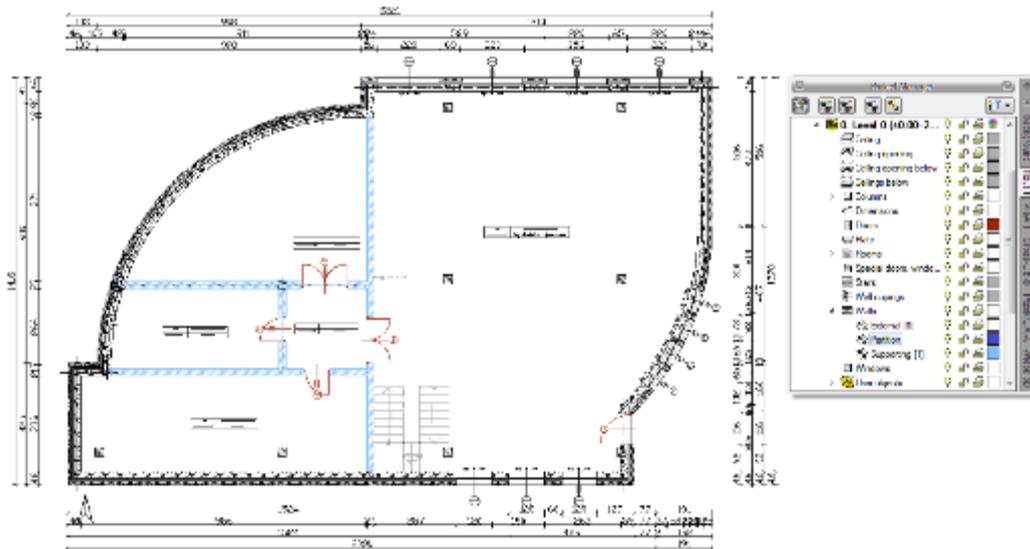
Once the entire level is drawn we introduce another level by copying the contents. No partition walls are necessary in the Substructures level, so after quick-selecting the entire group (indicating the group and pressing the  *Select items* button) you remove all the walls from the group by pressing the *Delete* key.



Drawing 7. Marking the group from the Project Manager window

Basics of Application operation

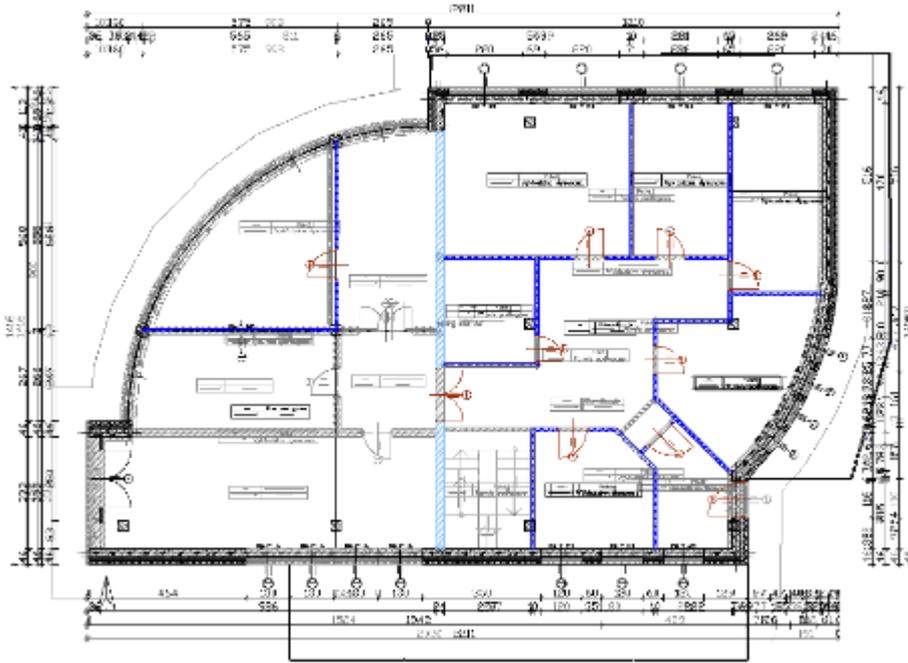
You then change the thickness of external walls included in the next group by removing one of the layers.



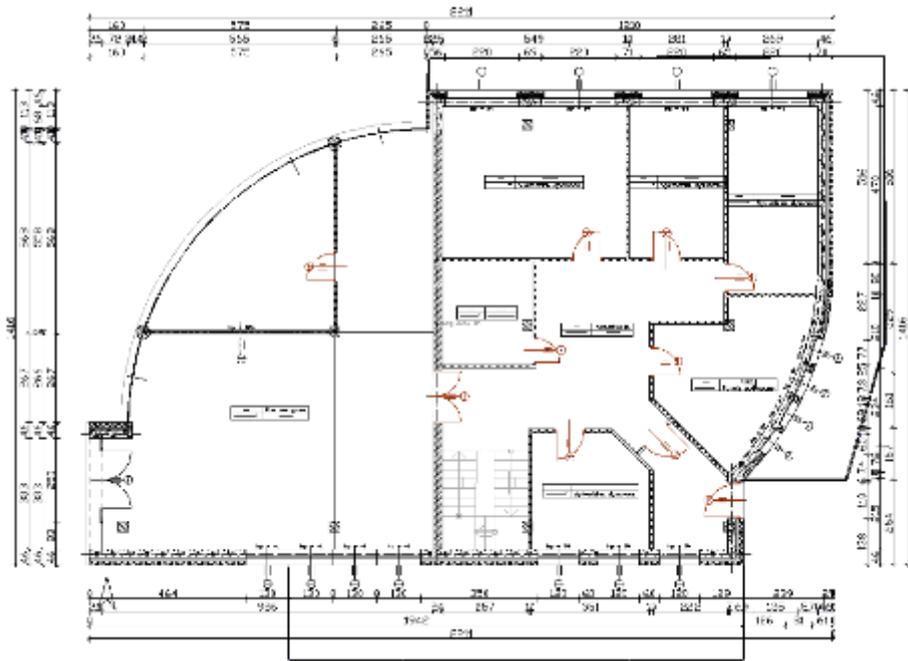
Drawing 8. *Modification of the elements form the selected group*

Groups may be created for all elements in a level.

The *Project Manager* also enables management of views i.e. saved "worksheets". A view may define what and how will be visible in the subsequent views and cross-sections. This means that one project may have any number of views that e.g. present the subsequent levels. Once distributed on the working screen such views enable the presentation of the project one level next to the other, though in the physical model the levels are still one above the other.



Drawing 9. A projection of the ground floor with a preview of the other levels in the project.



Drawing 10. Projection of the ground floor level

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Drawing 11. Views with only one level enabled in each view.

NOTE: Elements that are added in the levels are automatically placed in the Project Manager tree as User items and turned on along with the level. If the user moves to the AutoCAD, ArCADia or ArCADia-INTELLICAD software layer by introducing additional items, these will not be assigned to a level.

The user items, i.e. lines, polylines, descriptions, circles, etc. are placed in the *Project Manager* in the *User items* subgroup. This group operates similarly to the Levels, which means that the items are introduced into the active subgroup marked with the  icon.

3.2. Views

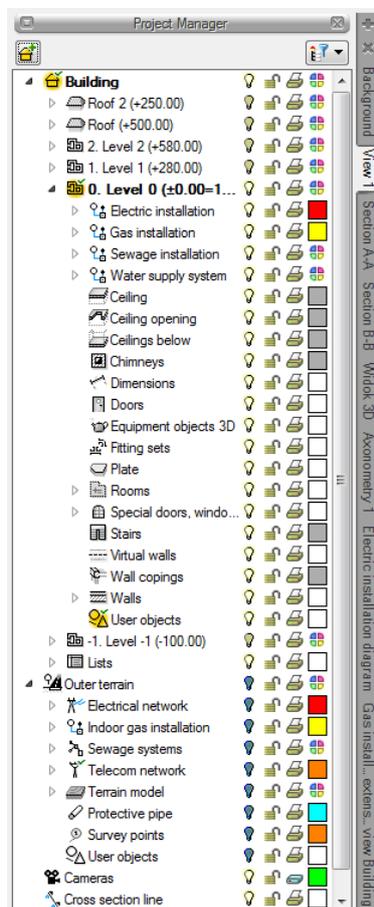
The ArCADia software allows creating the building shape or designing the gas or electrical networks by displaying these in different views. The first view is always the projection and subsequent views depend on the branch of the project. The additional views for architecture are the sections and elevations, for the water supply systems it will be the axonometry, for external gas installations it will be the gas installation profile, for the gas installation it will be the expanded view and axonometry, for the sewage installations it will also be the profile and expanded view, for electric installations and networks – schematic diagram and for gas installation – axonometry

And so, as an example: the level projection is entered as the first architectural view. You can work with one view, which will show the levels one above the other and you can also display the level projections in separate views so as to see all the levels one next to the other. Such operations are carried out on the views; levels are not shifted one next to the other, as this would ruin the building shape.

Section views, profile axonometry and 3D views may also be included in a project apart from the projection views. These views are independent and have their separate project trees in the subsequent tabs introduced. Switching between views is possible by clicking the view anchor (as is the case for

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sections, axonometries, profiles and views) into the *3D view* window or in the *Project Manager* by selecting the relevant tab located on the right or on the left side of the *Manager* window.



Drawing 12. *Project Manager* window

3.2.1. Projection

ArCADia presents the project in views of the building or buildings: projections, sections, elevations, axonometries etc. All the existing buildings or levels or only the selected items may be included in the projection view.

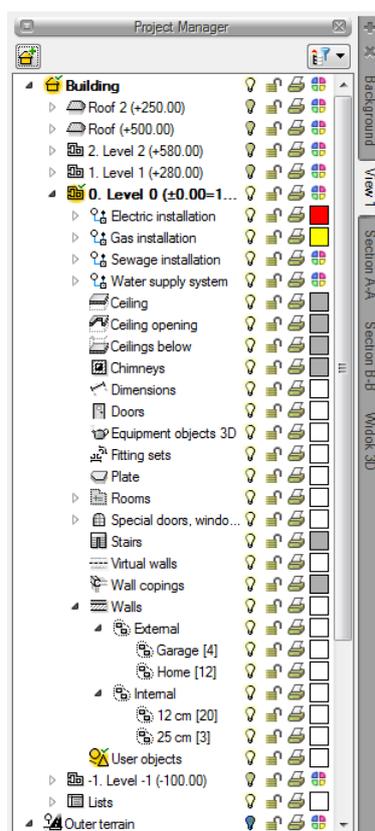
Adding a projection:

- *Project Manager* =>  => *Insert view*
- *Toolbar* =>  *Insert view*

NOTE: Another (new) projection view can be inserted only when projection view is active. With other views: cross-sections, 3D view, axonometry, etc. new view will not be inserted, instead information about necessity to switch to projection view will be displayed.

Switching and managing the projection views is done through the *Project Manager*.

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Drawing 13. *Project Manager window*

Only one building and one level or the land and the installation designed on it may be active for a projection. The rest is only an underlay which may be made visible or turned off with the  icon. This means that inserting and editing is only done in the level marked with the Active level yellow icon . Focus is switched by double-clicking on the selected level lub clicking the icon before the name once.

The projection is divided into buildings and terrain, buildings are divided into levels and levels are divided into item groups: branch installations, walls, doors, headers, ceilings, etc. The area is divided into the model and the networks designed on it. What is visible in the projection view depends on the items selected in the *Project Manager*.

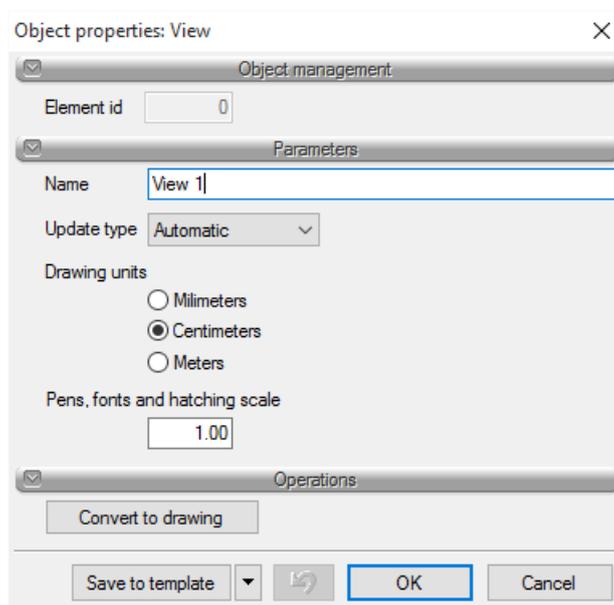
It is possible to create any number of projections and define the displayed items for each of them. Switching between views is done by clicking the tab (name) of a particular view located on the left or on the right side of the *Project Manager* window. The number of views included in a single project is limited only by the computer's capabilities.

In order to add a projection view:

- *Project Manager* =>  => *Insert view*
- *System* ribbon => logic group *View* =>  *Insert view*

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Indicate its location. Before or after introducing a projection you can adjust its properties after right clicking on the tab for the particular view and selecting the *View properties* from the context menu.



Drawing 14. Selected view properties window

In the window above you may select a name, *Update type* and *Drawing units*. Moreover, the selected view may be converted using the *Convert to drawing* option and hence it will be composed of lines only. This will enable e.g. working on the details of the sections or details. This option, however, should be selected at the end of designing, since the view transformed into drawing will be no longer copied along with changes in the project.

NOTE: When working on a large project composed of several views you may need to set the *Update type* to *Manual*. This will greatly speed up working on the project, since an element introduced in one view will not have to be represented on the other ones yet. Having to reflect all the introduced options in more than one view greatly increases the duration of the drawing process.

3.2.1.1.1. Example: INTRODUCING CAD PROJECTIONS

Below is a description of the process of introducing CAD level projections, which means working on a background provided by a designer working in CAD.

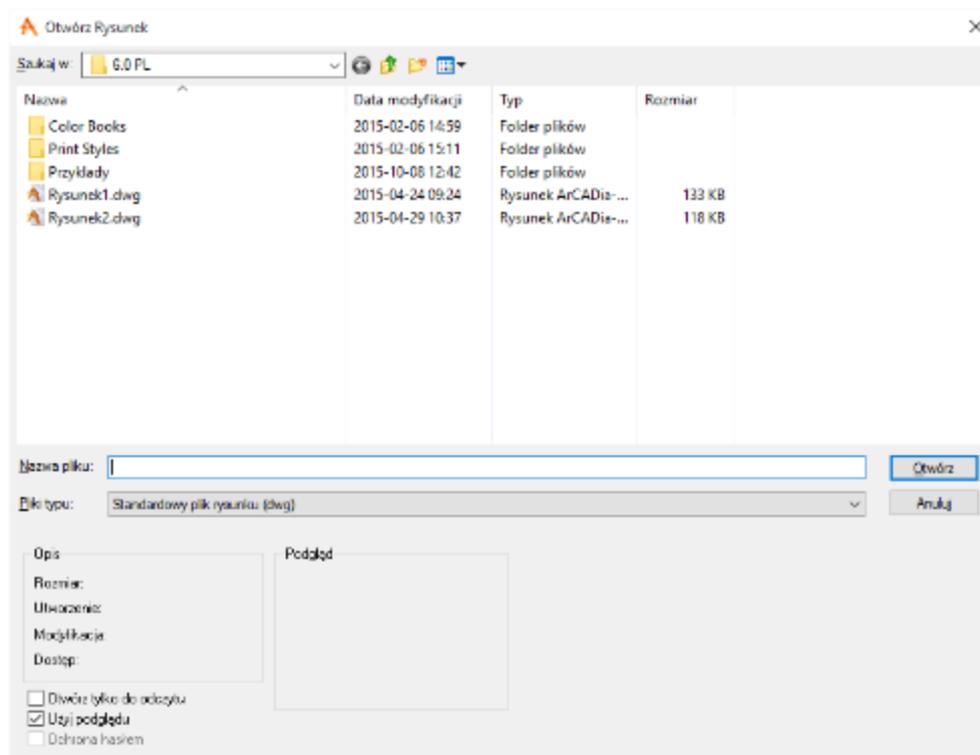
This is a common situation where the designer receives a building plan from the architect in the form of a .dwg file where the projections have been created in a CAD program and do not include objects (walls, windows, doors) and only a 2D drawing of the projections. ArCADia allows you to import such projections and use all the features that the ArCADia system provides to the user, adhering to the rules of creating buildings in the ArCADia environment. The purpose of the example above is to facilitate the

Basics of Application operation

introduction of such projections step by step into the ArCADia system for the engineer. It is irrelevant which branch module the user works in, the steps described are universal for each module.

Opening a project:

- *Home* ribbon => logical group *File* =>  *Open*
- *ArCADia*  button =>  *Open*



Drawing 15. *Opening project window*

1. Select the file type you want to open from the drop-down list for the particular file type.
2. Choose the folder that contains the selected drawing.
3. Do one of the following:
 - Choose the drawing that you want to open and click *Open*.
 - Double-click the drawing you want to open.

If the drawing requires a password, provide the password, click *OK* to verify the password and then click *Open* again.

Working with the file

For the purposes of this example we will use a file that includes the architectural projections of a building with the following levels:

- substructures,

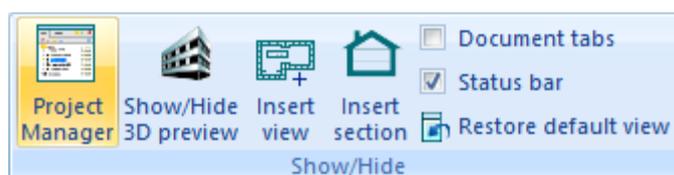
Basics of Application operation

- ground floor,

- attic.

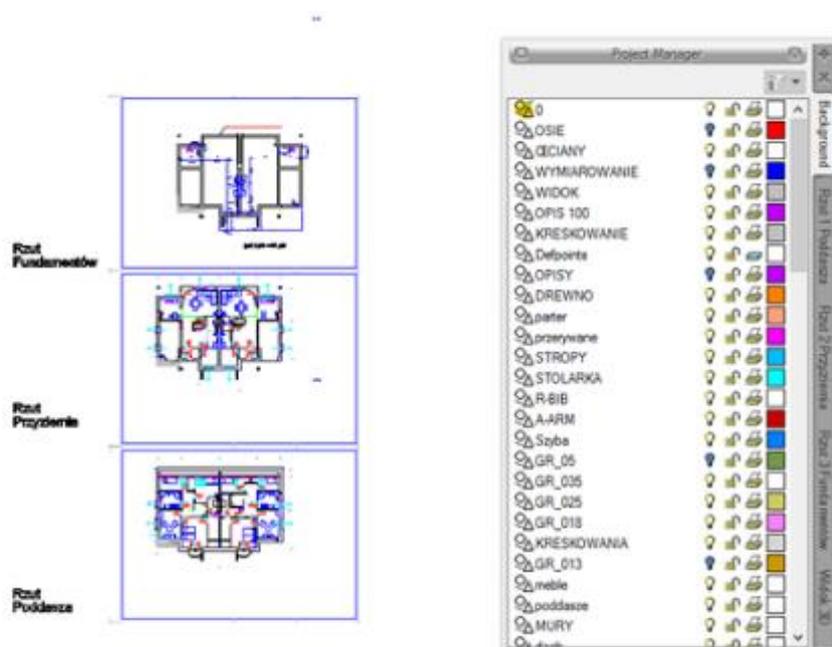
After opening the file the *Project Manager* window will be displayed. This is a software element necessary to utilize the software correctly and fully. You can turn it on by clicking the icon located in the ArCADia-START bar or from the *ArCADia* menu ⇒ *Show/Hide the Project Manager*. For users who have the architectural module in the ArCADia-ARCHITECTURE bar  or in the *View* ribbon in the

ArCADia-START  software.



Drawing 16. *Activation of the Project Manager window*

Below is an example of an open *CAD* file with the projections of building levels.



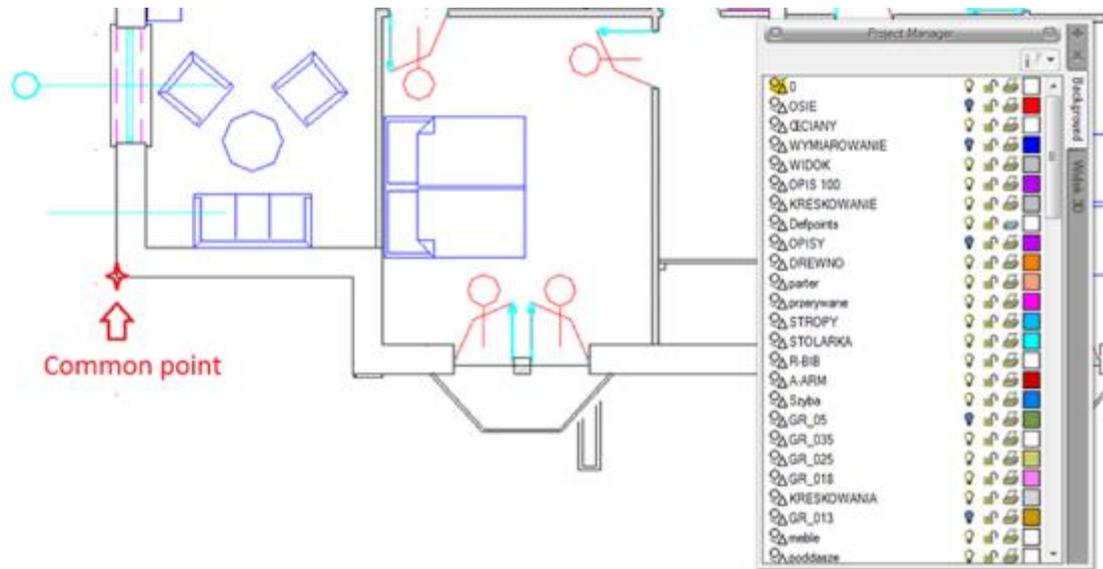
Drawing 17. *Example of open CAD file with projections of building levels*

As you can see in the projection above, only one view tab is visible in the *Project Manager* window: *Underlay*. This is a view where all the non-object *CAD* items (lines, circles, hatching, etc.) included in the file are displayed.

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Introducing projections

The first step to introduce a building is to locate the common point for all the projections in each *CAD* level projection. This may be the building corner, staircase contour, lift shaft contour, etc. The example below includes a common point being the building corner.



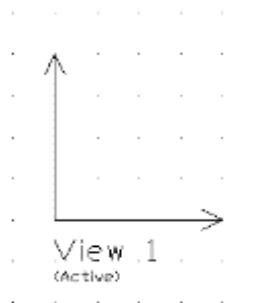
Drawing 18. Example, where constant point is the corner of the building

In the top right corner of the *Project Manager* window there is a grey plus icon. After clicking the icon you have the possibility of introducing a projection (and cross-section). Select the *Insert projection* option.



Drawing 19. Selecting the insert projection function

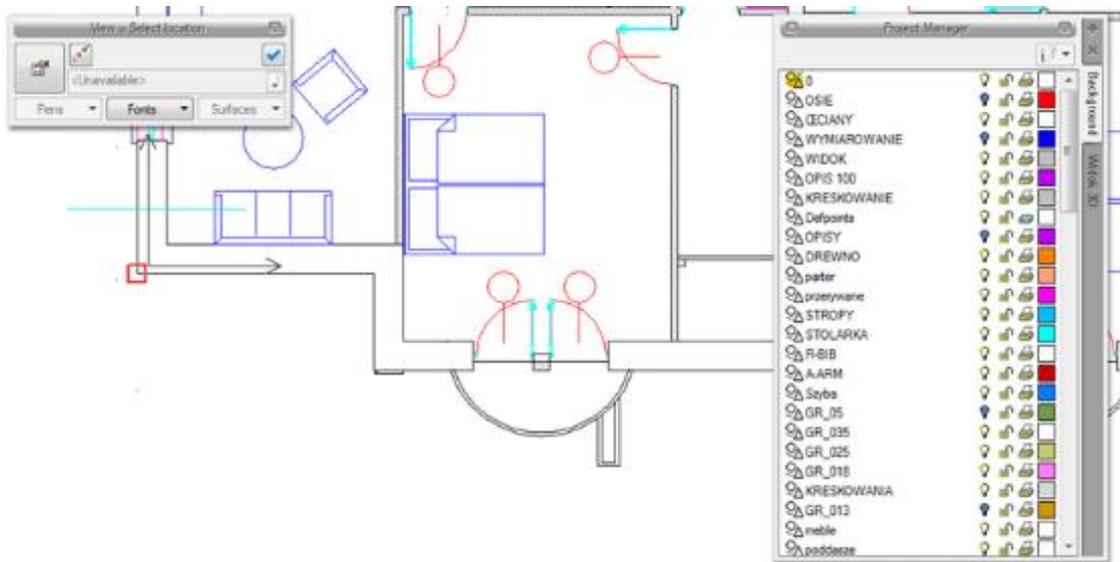
You then get the possibility to insert a projection view which will be represented in the drawing as a view anchor.



Drawing 20. View anchor projection inserted to the drawing

Basics of Application operation

Using the *CAD* anchor points, e.g. *End*, insert the projection at the building's common point site.



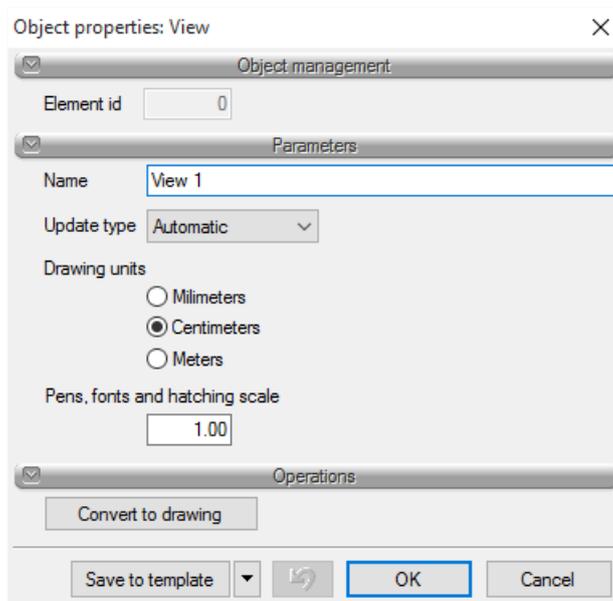
Drawing 21. *Inserted via anchor*

NOTE: When inserting a projection the *View properties icon*  is available in the insertion window, and after the projection is inserted and the anchor is selected, it is also available in the modification window. After clicking this icon you may use the view parameters window, i.e. e.g. the drawing units.



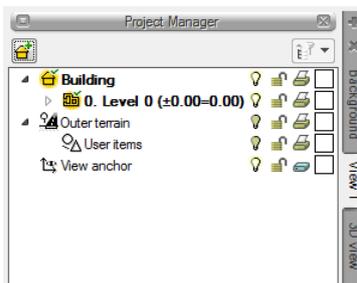
Drawing 22. *Inserting and editing view windows*

Basics of Application operation



Drawing 23. View properties dialog box

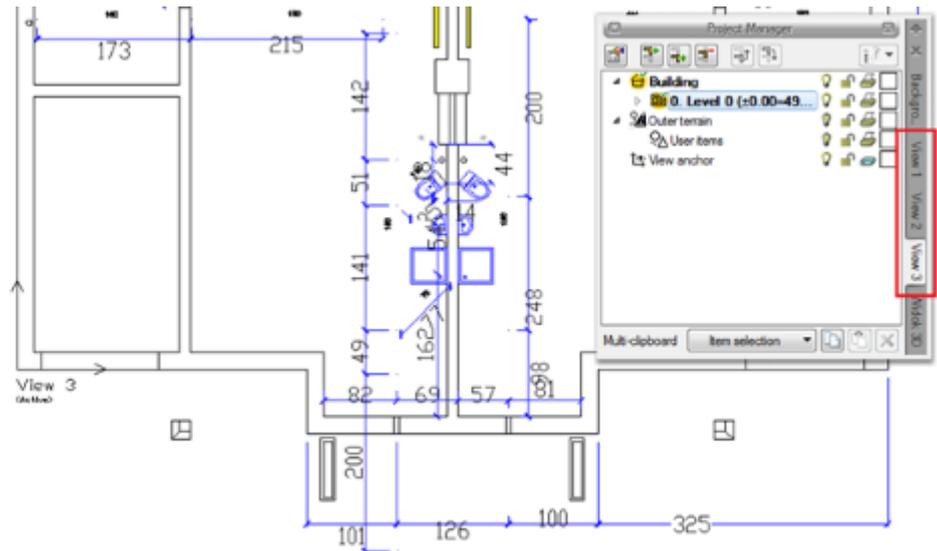
NOTE: The ArCADia system will activate when inserting a projection. You need to select a template you want to work with and activate the building by clicking not the terrain, but rather any architectural element or an element of a branch module the elements of which are being introduced into the building, e.g. ArCADia-WATER SUPPLY SYSTEMS.



Drawing 24. Project Manager window after inserting the view

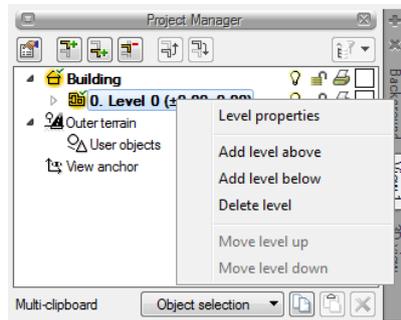
The next step is to insert the *Projection 2* view, similar as with the *Projection 1* view, however this time you need to click a point located in the *CAD* protection of the subsequent level, *Ground floor*. Then you need to insert the *Projection 3* view in a constant point in the *CAD* projection of the *Attic* level. (The steps for inserting a projection view are to be repeated until each *CAD* projection of a level from the drawing has one corresponding projection view in ArCADia).

Basics of Application operation



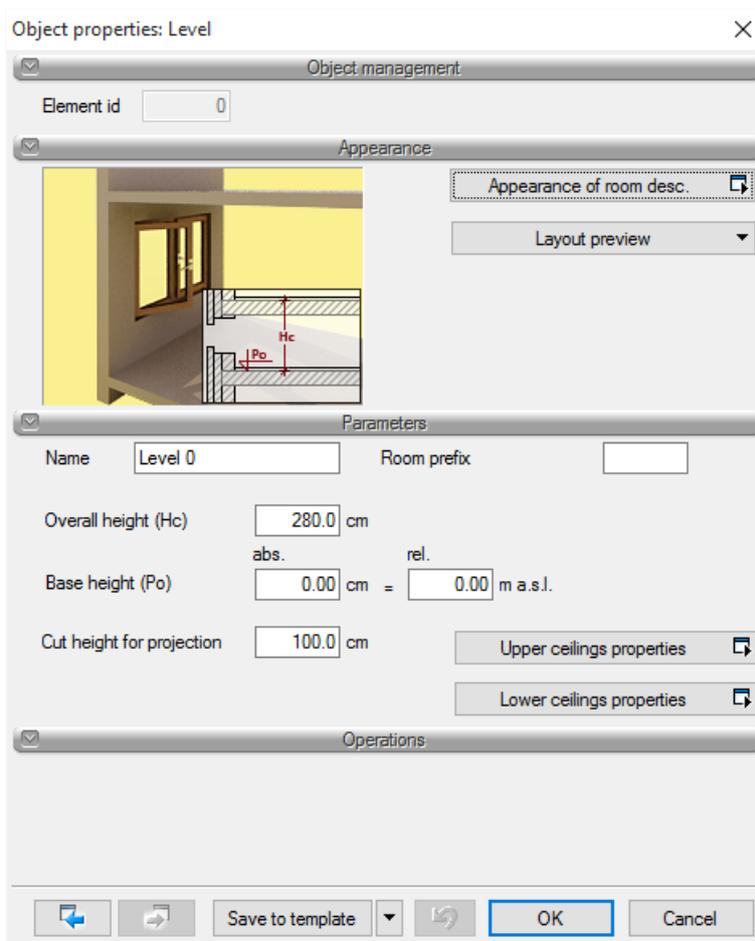
Drawing 25. *Tabs of the subsequently added views*

The level 0, which is inserted by default, is now available in the *Project Manager*. You need to open the properties of this level by right clicking on the following description in the editor: *0 Level 0 (+/- 0.00=0.00)*.



Drawing 26. *Context menu for selected level*

Basics of Application operation



Drawing 27. Selected level properties window

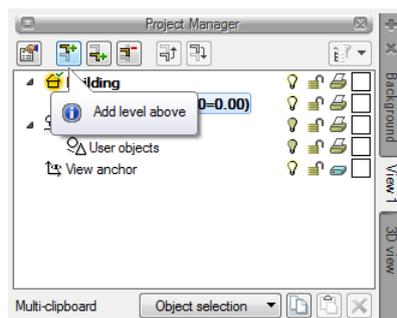
In the *Level properties* window above the user can set the name, e.g. Substructures, and change the level height (280 cm by default). You can also change the absolute height of the entire building for the level set as the base level. After inputting the appropriate data you need to close the *Level properties* window by accepting it with the *OK* button.

The next step will be to add subsequent levels in the *Project Manager*. This is done with the help of the buttons located in the top part of the *Project Manager* window.

 – *Add level above*

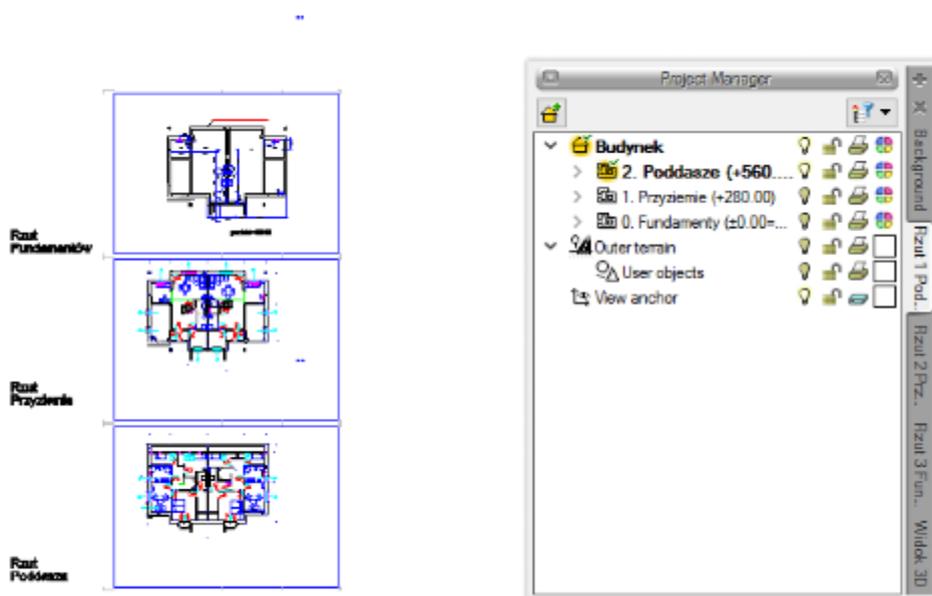
 – *Add level below*

Basics of Application operation



Drawing 28. Adding new levels icon

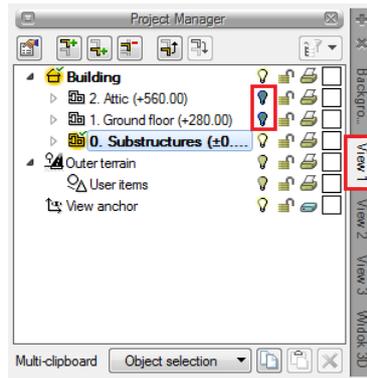
After inserting another level the user may again open the level properties and change the relevant parameters. Repeat this procedure as many times as there are levels to be included in the building.



Drawing 29. Example with three views inserted

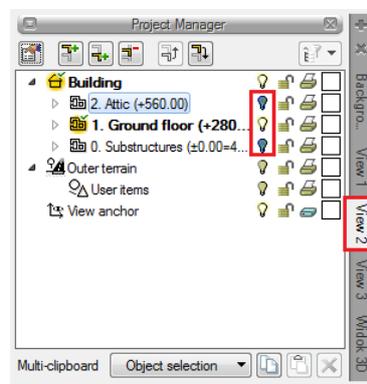
Then in Projection no. 1 you need to deactivate all the levels except for e.g. the lowest one (*Substructures*) by clicking on the light bulb located on the right of the level name in the *Project Manager* tree. Then you need to repeat this in Projection no. 2 and deactivate all the levels apart from the next one, e.g. *Ground floor*.

Basics of Application operation



Drawing 30. *Deactivating level on Projection No. 1*

Deactivating levels in Projection no. 2



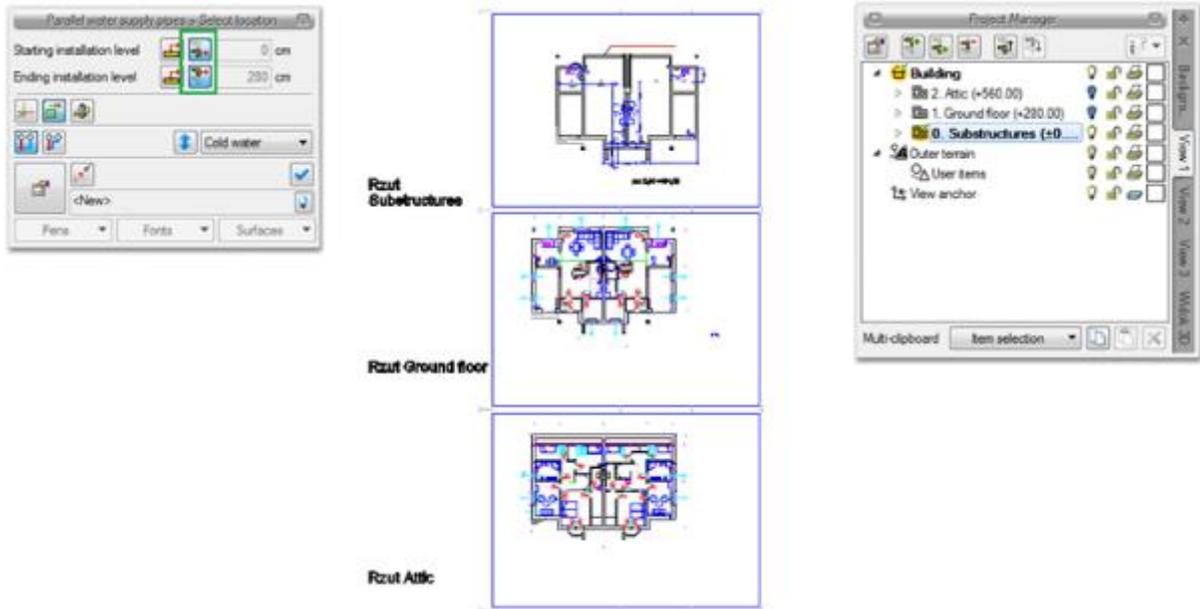
Drawing 31. *Deactivating level on Projection No. 2*

You can change the projection names to correspond to the level names which are active in the particular projection, to facilitate work. The name can be changed in the [View properties](#) window.

Then you can move over to designing the installations. In the example of ArCADia-WATER SUPPLY SYSTEMS presented above the user may verify whether the building was introduced in a manner enabling him to use the ArCADia system features.

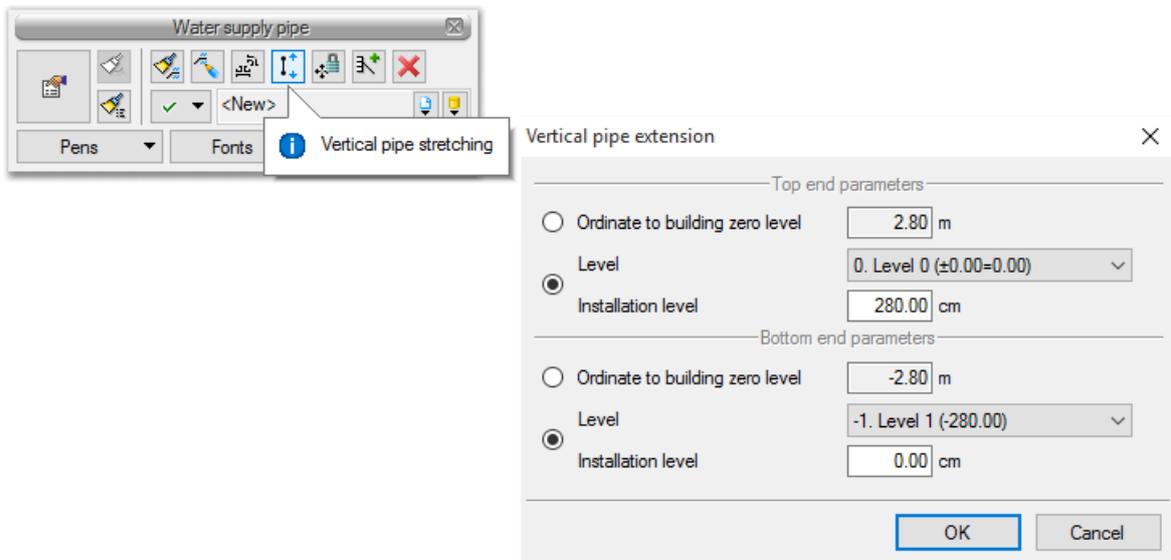
We insert e.g. a water pipe with the [Copy from level](#) above and below in the lowest level. Inserting parallel water supply pipes is presented below.

Basics of Application operation



Drawing 32. Inserting water pipes to the projections

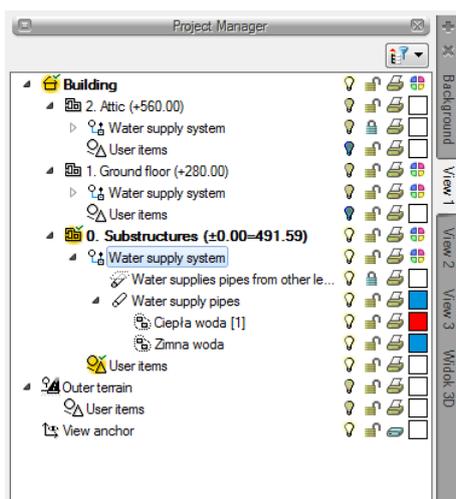
Then the user may stretch the water supply pipes onto all the levels.



Drawing 33. Designing water-supply installation

After extending the tree and levels in the *Project Manager* the user will be able to see the *Water supply system* branch.

Basics of Application operation



Drawing 34. *Project Manager window with water pipe network elements inserted*

3.2.2. Section

If you have ArCADia-ARCHITECTURE licence installed, you can add any number of vertical sections to the project. The Sections can be straight or stepped (offset).

3.2.2.1. Adding straight Section

- *Project Manager* => => *Insert Section*
- *View* ribbon => logic group *Show/Hide* => *Insert Section*

NOTE: Cross-section can be created only on active projection view. With other views: cross-sections, 3D view, axonometry, etc. a cross-section will not be inserted, instead information about the necessity to switch to a projection view will be displayed.

The Section is implemented by pointing on two points of the building cut line, its direction and drawing place. By default, after setting the Section, it is shown as an inactive View, drawn as an underlay. If you want to switch to the Section, you just need to double-click on the View symbol



or select its name on the *Project Manager* tab.

All the levels are active in the Section, so you can edit here the elements of each level without switching between the levels.

The new version allows you to enable 3D objects on the section. This option is by default disabled because copying more objects may take a while (everything depends on the degree of complication of the objects and their number). When opening the project from an older version, the objects on the sections will not be visible, because their visibility bulb is disabled. Objects will be enabled after changing the bulb status.

Basics of Application operation

NOTE: *It is the best solution to set the Update type to Manual for the Section created. This will not slow down the operation, in other words, it will not be necessary to insert one item in each view.*

In the Section *Properties* you can define the method of showing the trimmed building: only trimmed elements visible or all Section elements visible. *Zero depth* option allows to show only the sliced items, while the items shifted from the Section cut line are not displayed.

NOTE: *The Section is one of the Views of the designed building body. Any modifications introduced into the Section will also be represented in other Views (Sections and 3D View). If you need to change the Section without interfering with the building body, then you may Convert the Section into the drawing via View properties . Any modifications introduced into the exploded view are not represented in the project. This also means that the change in the building body will not be drawn in this Section.*

After inserting the section, it is an inactive view, work still goes on in the projection. To switch to the section, click its tab in the *Project Manager* with or double-click to select the section handle.

3.2.2.2. Stepped Section

ArCADia-ARCHITECTURE allows to insert only one straight Section. The Section drawn can be further converted into the stepped Section by adding the step, i.e. break the Section cut line. The Section may feature any number of steps, however only one break can be added at the same time.

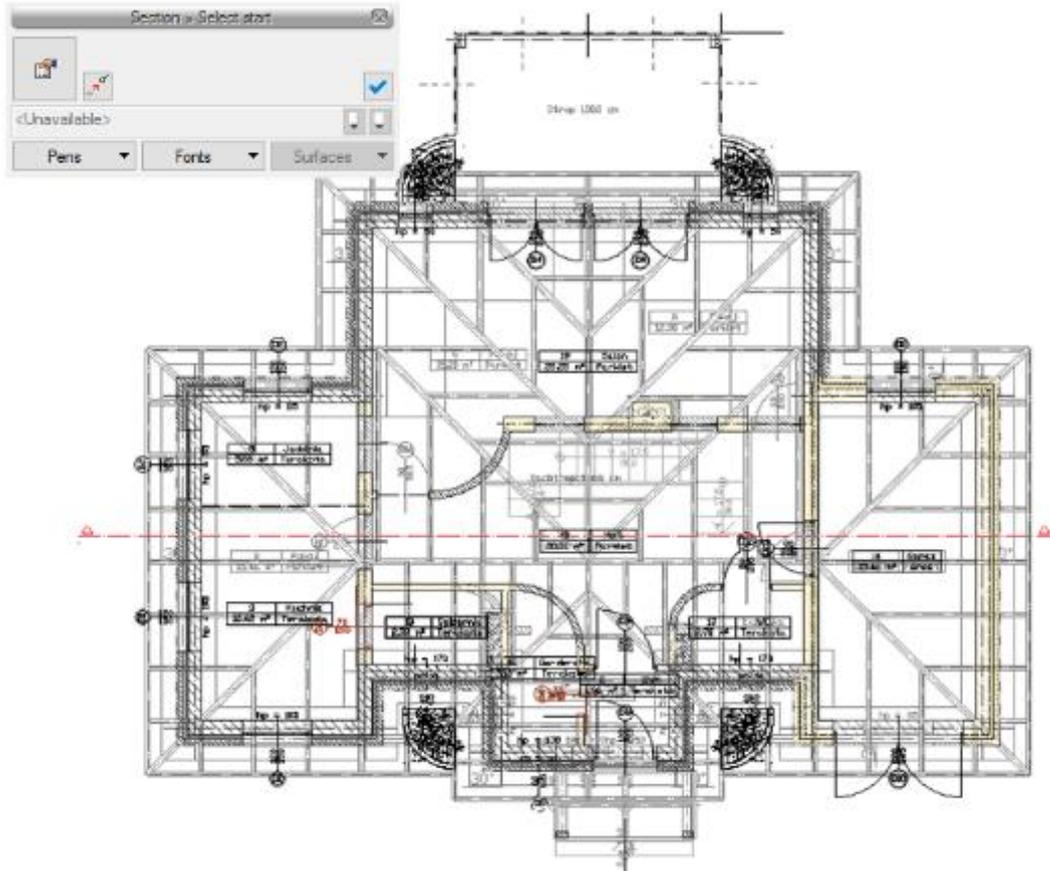
Activated from the menu:

Application:

- *Section* taskbar =>  *Add section step*

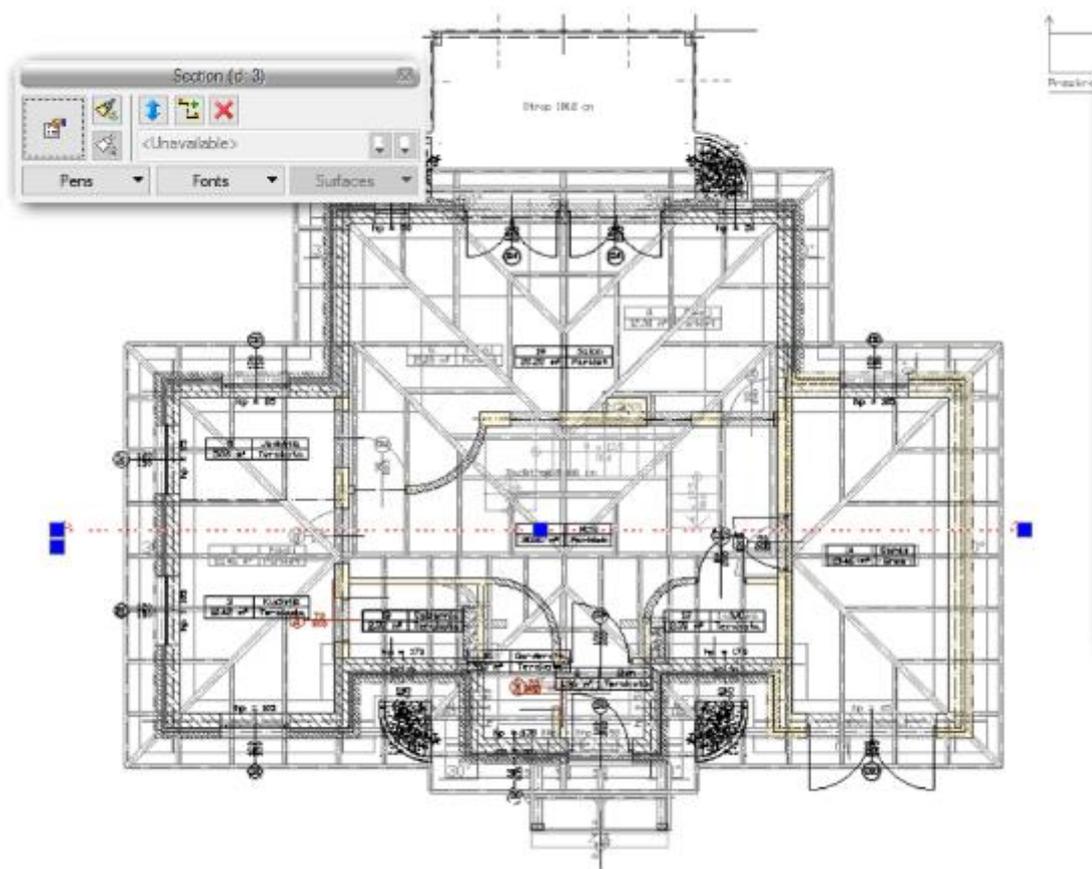
The example of defining the stepped Section is shown below:

Start by defining the straight Section, that is, by showing the cut line and drawing place of the Section.



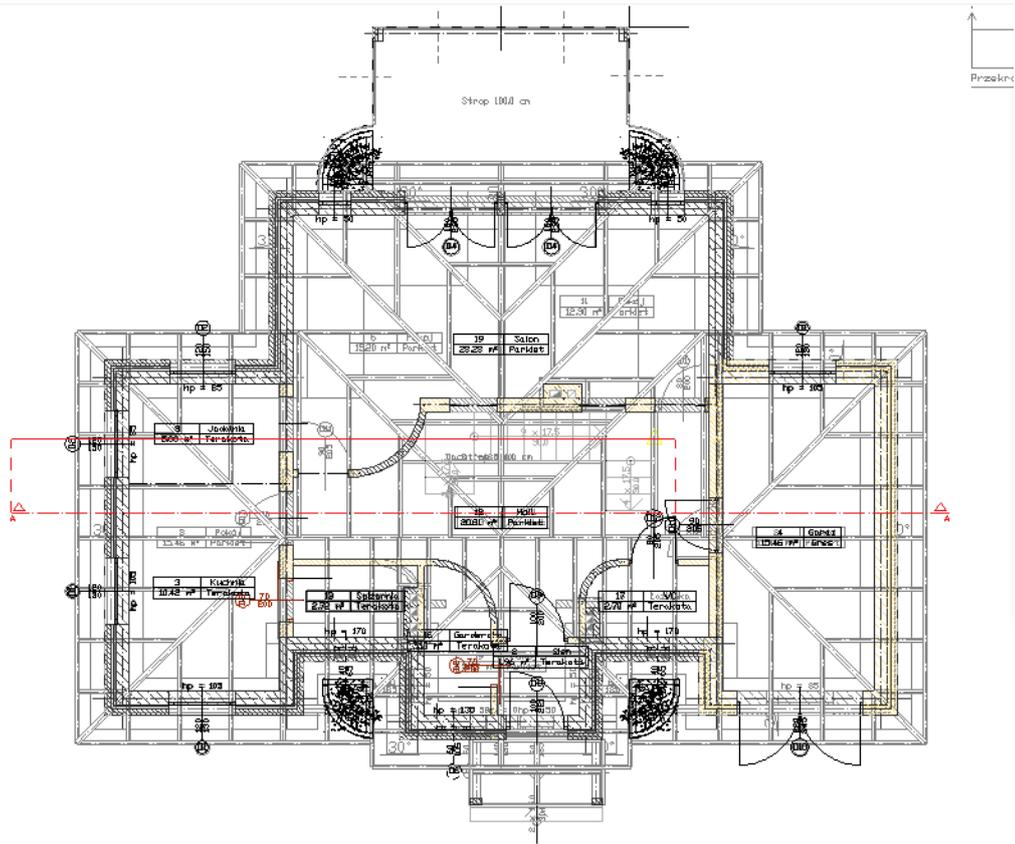
Drawing 35. *Inserted and selected straight cross-section line.*

Select the section line and  *Add section step* icon from the taskbar.



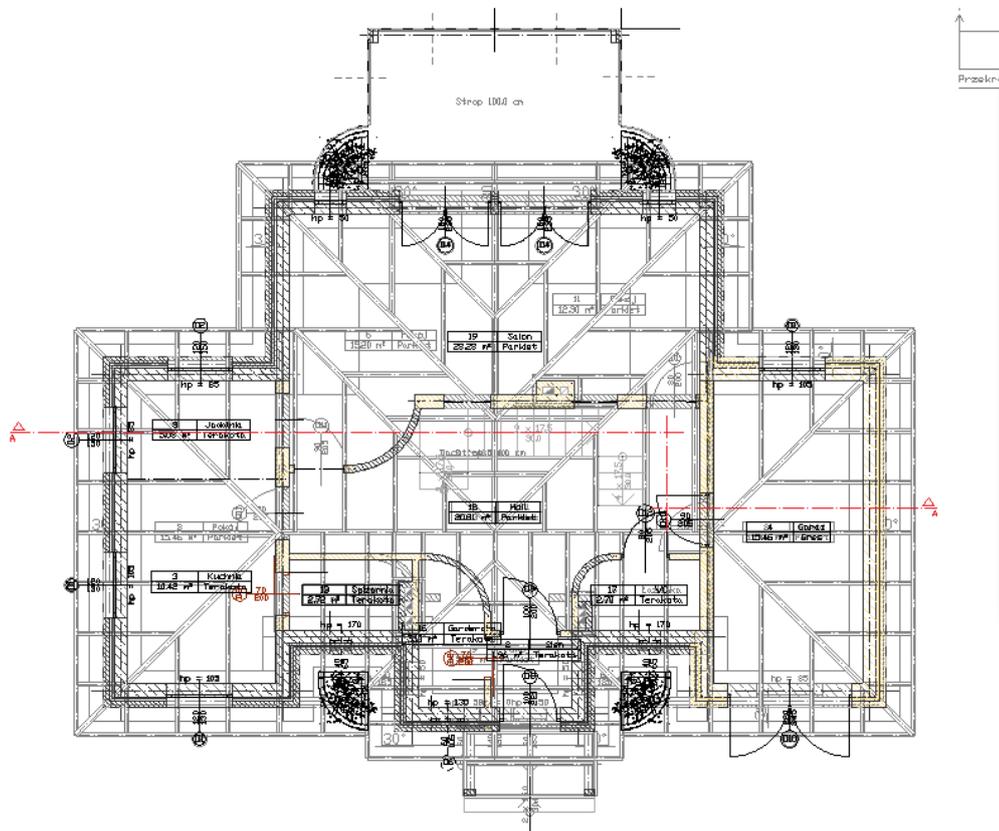
Drawing 36. *Modification of straight cross-section into stepped cross-section by selecting the bending place.*

Show the location of cut line break and its level on the layout.



Drawing 37. Drawing out the cross-section degree

The Application calculates the new Section and inserts the new curved cut line.



Basics of Application operation

Drawing 38. *Stepped cross-section line on the projection*

3.2.2.3. Facades

To create a facade for the technical documentation, the software has no special options planned. Facades are made using the section option, but the cutting line does not go through the building, but is conducted before it. The length of the section line from the walls in the building does not matter here.

3.2.3. Axonometry

Axonometry is introduced to the project while working in ArCADia-WATER SUPPLY INSTALLATIONS, ArCADia-GAS INSTALLATIONS and ArCADia-HEATING INSTALLATIONS modules. The view is introduced to similarly to the Projection view, i.e. you indicate or specify the point of inserting the handle, and the view is copied automatically.

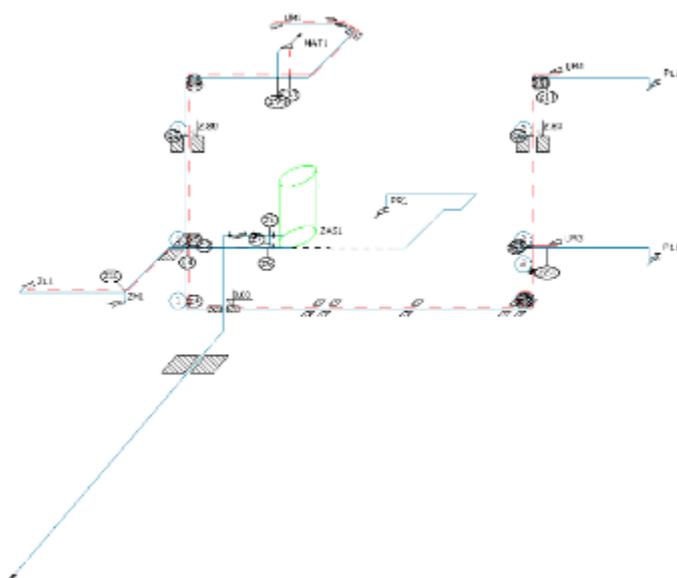


Fig. 14. Example of axonometry of a water supply installation in a detached house

After inserting the view, the software switches to it automatically.

3.2.4. Profile

The profile view is introduced in modules: ArCADia-SEWAGE INSTALLATIONS and ArCADia-EXTERNAL GAS INSTALLATIONS. This view is introduced by choosing the initial element, the path of the main profile and the profile path.

Basics of Application operation

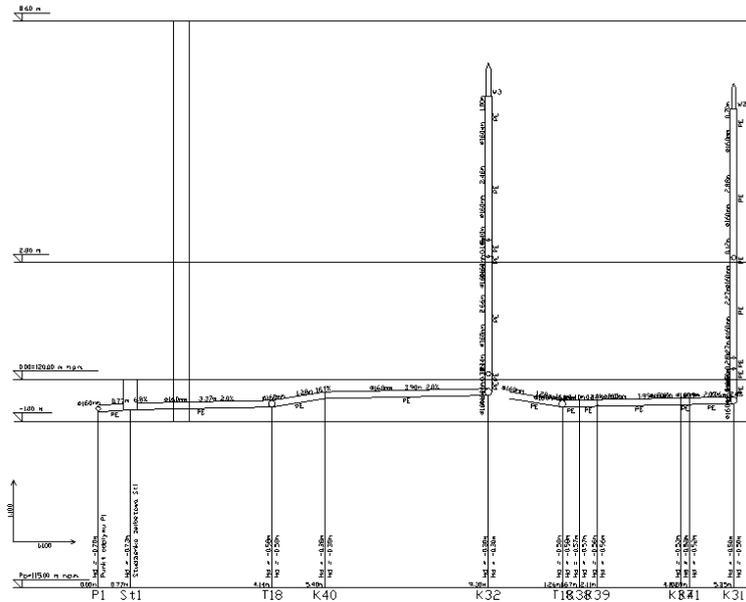


Fig. 15. Example of the sewage installation profile

After inserting the view, the software switches to it automatically.

3.2.5. Expanded view

The expanded view is introduced in modules: ArCADia-SEWAGE INSTALLATIONS and ArCADia-GAS INSTALLATIONS. The view is introduced by indicating the place of introducing the expanded view.

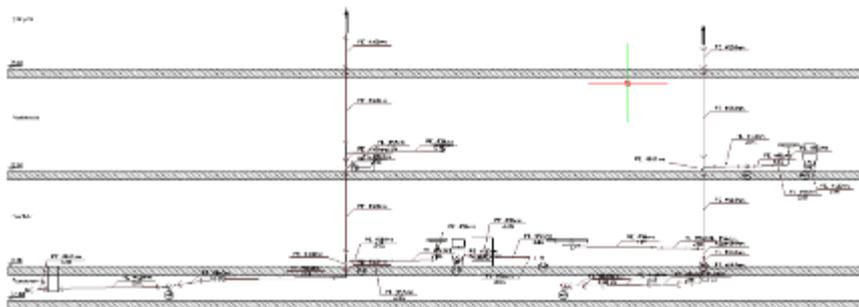


Fig. 16. Sample expanded view of t sewage installation

After inserting the view, the software switches to it automatically.

3.2.6. (Schematic) diagrams

The view of diagrams is introduced in modules: ArCADia-ELECTRIC INSTALLATIONS, ArCADia-POWER NETWORKS AND ArCADia-TELECOMMUNICATION NETWORKS



Basics of Application operation

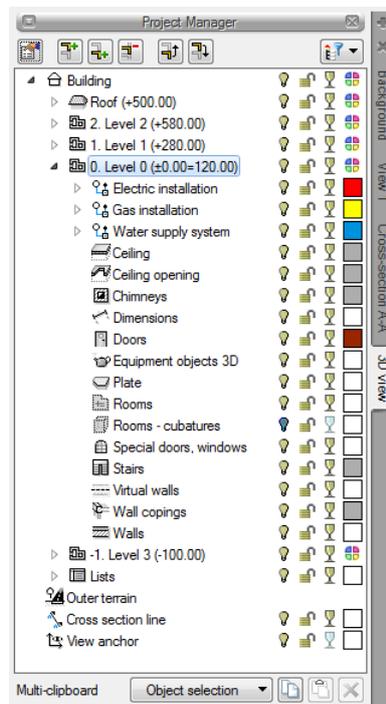
Fig. 17. Fibre-optic cable diagram

After inserting the view, the software switches to it automatically.

3.2.7. 3D View

The ArCADia BIM projects are three dimensional projects. All the elements introduced include both information about the dimensions in the plan view and the elevation view. the building shape may be viewed both in the *3D view* and in a cross-section.

NOTE: The ArCADia system for each view has a separate project tree placed on the view tab. This means that the 3D view has a separate project tree and before turning items in the view on/off you need to change the view into 3D view in the Project Manager first and only then adjust item visibility. This will not change the visibility in other views.



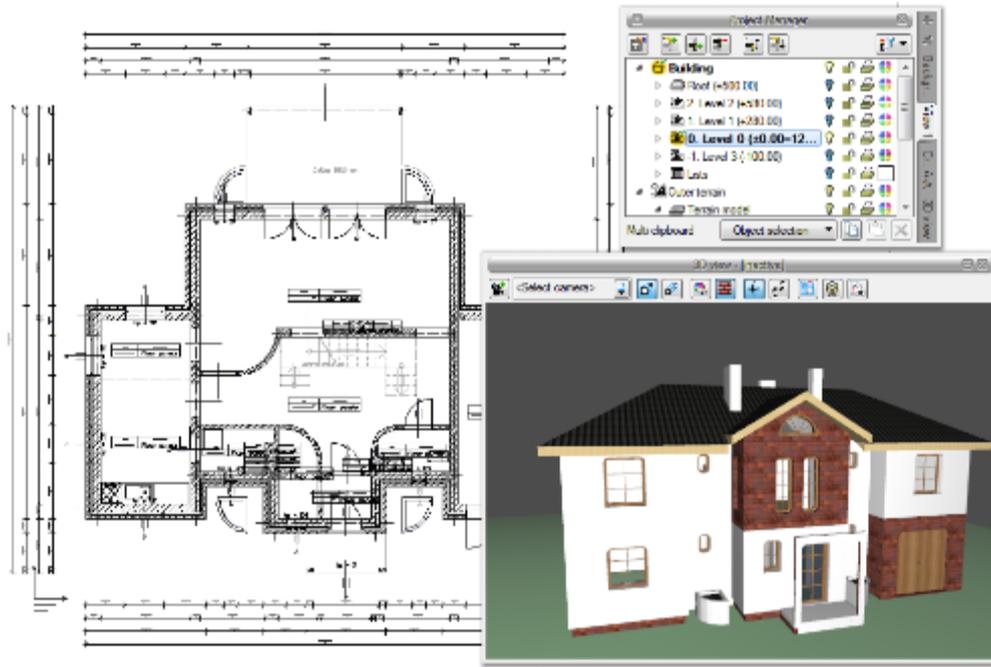
Drawing 39. Window Project Manager with elements tree for sample document for 3D view

The *3D view* tree is different from the other views in that you cannot adjust item printing properties in the view tree, since only a saved image can be printed. Instead of printing the view tree offers the feature to glaze an item .

Activation:

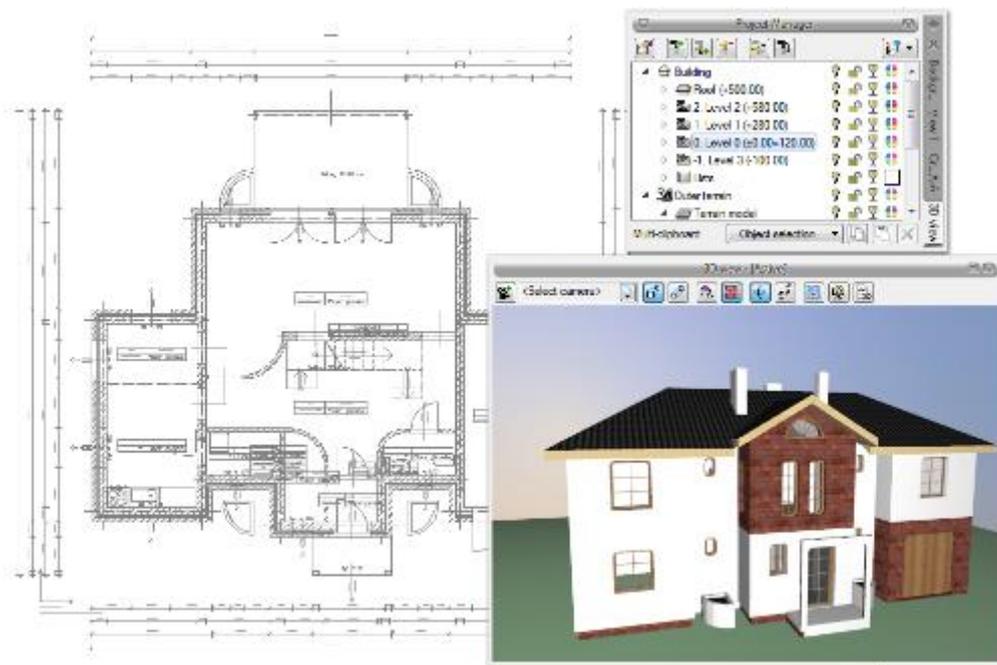
- *View* ribbon => logical group *Show/Hide* =>  *Show/Hide 3D preview*

Basics of Application operation



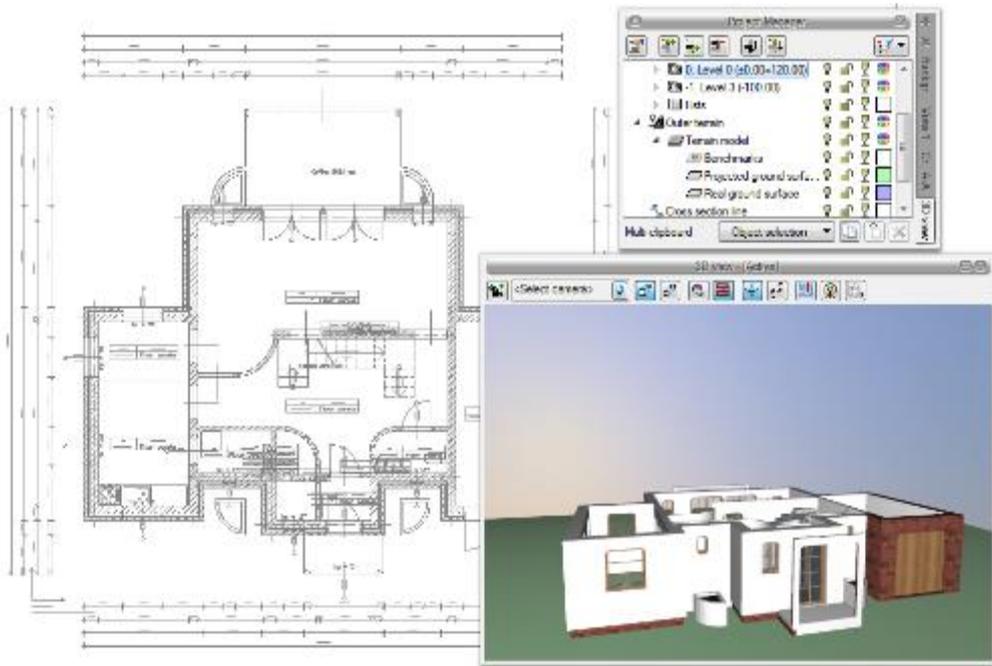
Drawing 40. Example with active view Projection 1

The *3D view* is handled similar as the projection view through the *Project Manager* in a dedicated, separate *View tree*. Which means that in order to select the visible/not visible items it is first necessary to switch to the *3D view* tree and then what is marked in the current view in the project tree is displayed in the preview and what is turned off is not displayed.



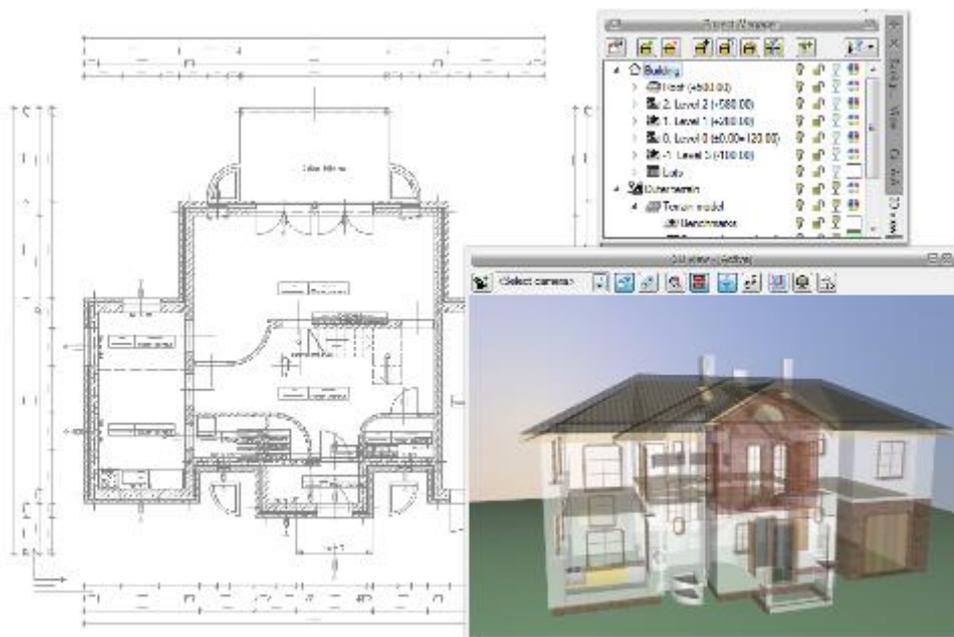
Basics of Application operation

Drawing 41. Example with active view – 3D view



Drawing 42. Example with active view and defined visibility of the elements

The objects removal feature => **✗ Remove marked objects**) is transferred from the *3D view* window to the action bar, which appears once an item is selected. You can only remove a selected element from there. Glazing a shape was also modified and now you can glaze the particular level items, levels or the building by selecting respective  icons on the project tree.



Basics of Application operation

Drawing 43. Presenting transparency for elements

3.2.8. 3D preview options and navigation

The *3D view* which provides access to all the settings and options, etc. in its window. By default, the view window shows the perspective of the created project (the option  *Perspective view* is enabled), but this view can be changed to  *Axonometric view*.



Drawing 44. 3D view window example

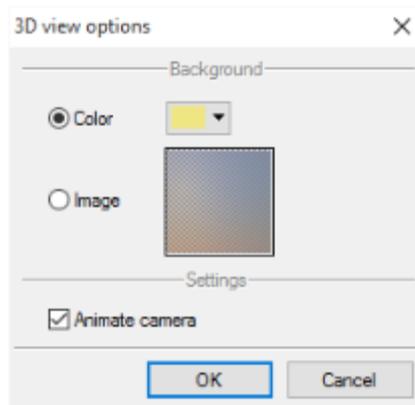
Tab. 1. 3D view properties set

	<i>Camera</i>	Registers the parameters of the current view.
	<i>Perspective view</i>	Shows the building in a perspective view.
	<i>Axonometric view</i>	Shows the building in an axonometric view.
	<i>Show layer colours from Project Manager</i>	Shows the building with colours designated for particular groups.
	<i>Show surfaces defined in elements</i>	Shows the building with the designated materials or textures.
	<i>Orbit mode</i>	Project display mode where the camera is located on the orbit of the project.
	<i>Walk mode</i>	Project display mode where the camera may be located inside the project.

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	<i>Rendering</i>	Creates a photo-realistic (2D) image of the designed building. Option available in the ArCADia-ARCHITECTURE module.
	<i>Multi rendering</i>	Saves photorealistic views for the cameras defined in the project. Option available in the ArCADia-ARCHITECTURE module.
	<i>Save scene as image</i>	Saves the current view from the 3D window as a <i>BMP, JPG</i> or <i>PNG</i> file.
	<i>3D view options</i>	Settings of the <i>3D view</i> window.
		Zooms in the project view.
		Zooms out the project view.
		Rotates the current view.
		Rotates the current view.
		Restores the default view settings for the entire project.

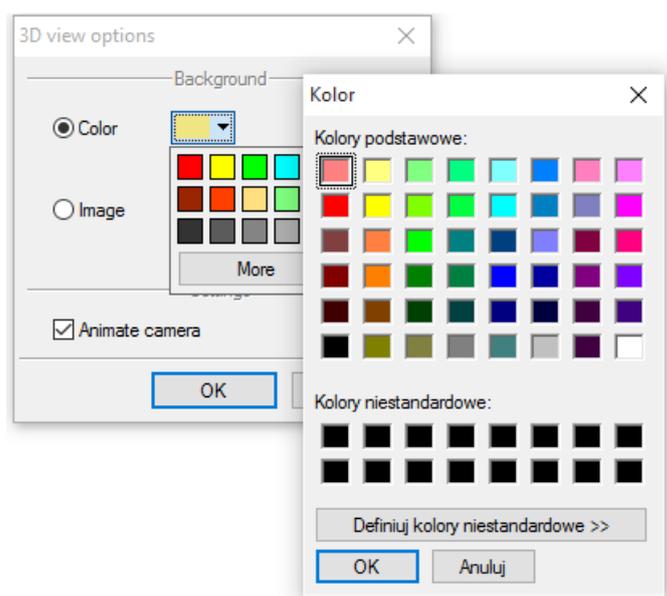
3D view options allow for defining of the background of the 3D preview window when the view is active. Additionally you can define if the change of the camera will be smooth (animation) or not and enable/disable the *Emergency mode*.



Drawing 45. *3D view properties window*

When changing the background to an *Image* you need to select the field, click the image preview and introduce a raster image in one of the following formats: *bmp, png, tiff* or *jpg*.

When changing the background colour to uniform *Color* it is necessary to select the *Color* field and click the colour button. By default you will be able to select from among 18 colours with the option to define additional colours after clicking the *More* button.



Drawing 46. 3D view background colour change

Watching the project in the view window, by default, is presented in  *the orbiting mode*, that is in the view where the camera rotates around the centre of the elements forming the scene (i.e. the building, the area or the along with the building). You can change the way of the project display, by changing the mode e.g. to  *flight mode*. Then, scene elements are rotated around your observation point. This point is a rotation axis. Apart from rotating, i.e. watching the project from the outside, you can also go (fly) to the inside of the building and see the project from the inside. The direction of the "flight" is then dependent on the looking direction, e.g. if we look slightly up, at one point we will move through the ceiling and the roof, if we go slightly down and do not correct this in a suitable place, we will go through the floor. If you want to walk around the project, without changing the storey, going in parallel to the floor, you have to switch to  *the walk mode*. Then, the observer's point will be the rotation axis of the scene and its elements, but the walk direction will not consider inclination of the camera in Z axis.

NOTE *The walk and flight mode are not available in the axonometric view.*

3D View gives also the possibility of various presentation of the project colours. By default, the option  *Show surfaces defined in elements* is enabled, and shows the elements of the project with materials placed on them, e.g. plaster on the wall, clinker on foundation or tiles on the roof. Sometimes, however, a more legible view (particularly when designing various installations and networks) is to enable the option  *Show colours of layers from the Project Manager window*, which shows the project in colours of groups set in the project tree, i.e. in the *Project Manager* window, in the *3D View* tab.



Fig. 1. The building in the view with surfaces defined in elements



Fig. 2. The building in the view of colour of layers from the Project Manager window

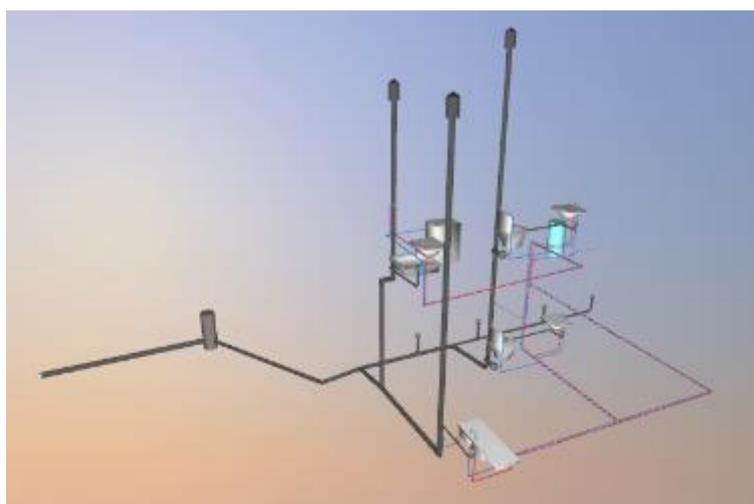


Fig. 3. Water-sewage installation. in the view with surfaces defined in elements

Basics of Application operation

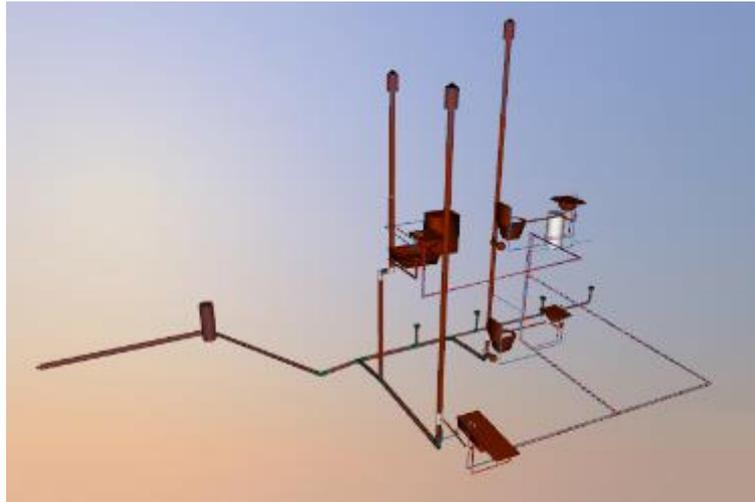


Fig. 4. Water-sewage installation. in the view of colour of layers from the Project Manager window

3.2.9. Camera

The *3D view*, apart from the default camera views the user may also save his custom observer's viewpoints. When inserting a camera its location, the "view" side, angle and image proportions are stored.

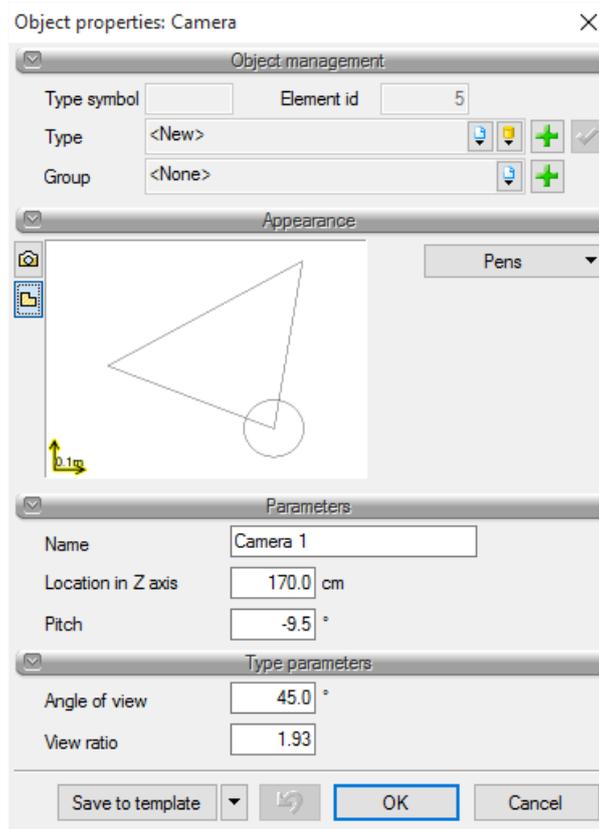
Activation:

- *3D view window* =>  *Add camera basing on existing view*
- *Architecture* ribbon => logical group *Supplementary elements* =>  *Camera*

If the option is selected from ribbon, it will be inserted in the projection. First the camera, then its direction.

NOTE: *The camera location is related to the zero point of the design, i.e. meters a.s.l. The camera is not linked to the level on which it is inserted, which means that if the building is located at 200 m a.s.l., the camera in the projection will be inserted at "0" by default. On condition that the correct values are entered in the properties window.*

Basics of Application operation



Drawing 47. *Camera attributes window*

Name — Name of the saved view/camera.

Location in Z axis— default value is 180, when inserting a camera into a projection you need to enter the correct value. If the camera is added in the 3D view, the height is read automatically.

Pitch — indication of the slant angle, which determines whether the view is facing forward, down or up.

Angle of view — the camera view setting angle (scope of view).

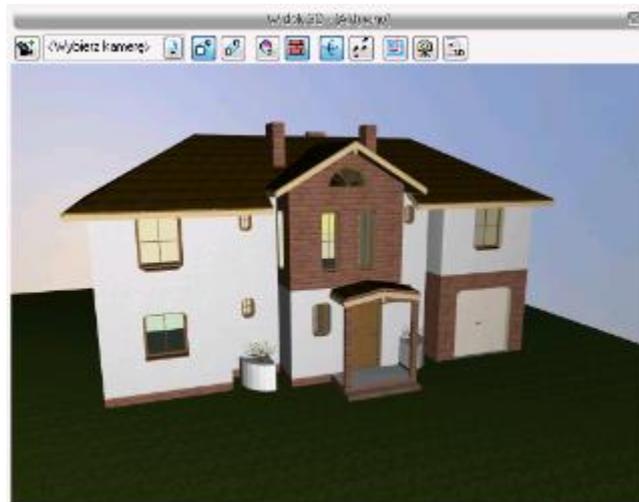
View ratio — when saving a camera the window size ratio (height:width) is also saved, depending on the future size of the window, once the saved camera is selected, the window size will be scaled to the saved ratio, thereby the view will match the saved camera view parameters. Even if the window is larger or smaller.

If a camera is added in the 3D view, all the parameters, except for the name, shall be read from the present view settings. If a subsequent camera is introduced the user will need to decide whether this will be a new view or a modification of an already existing camera. If it is a new camera, you save it under a new name. If this is a modified camera, when saving it you change the initial values permanently or until they are overwritten again.

Basics of Application operation

3.2.10. Saving view from 3D preview

The ArCADia BIM Application enables saving of the current View from the 3D preview using *Save scene as image* option. This feature does not include Raytracing option, it only saves the current View in one of the following three file formats: *BMP, JPG* or *PNG*.



Drawing 48. 3D view window



Drawing 49. Save from the 3D view window

3.2.11. Rendering

The ArCADia system has the *Rendering* option, which enables creation of a photorealistic view of the designed building. This option is available in the ArCADia-ARCHITECTURE module and is described in the help file to this module.

Basics of Application operation

3.3. Comparing projects

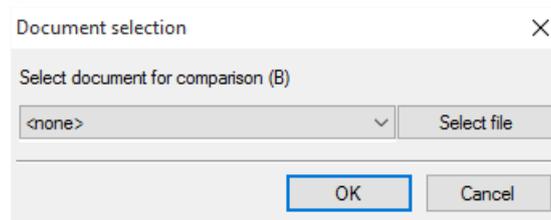
While drawing the project, you save it under different names. Sometimes it is one of the phases of the project, sometimes it is a safety copy. When searching for an appropriate phase of the project you open the files one by one and blindly look for the changes. Presently ArCADia system has new function of *Comparing Documents* which will help the user quickly find changes in two selected documents. This option can also be helpful with projects drawn by more than one person. In such case if you do not know exactly what was changed and what was added *Compare documents* option will be very helpful.

HINT: Only documents based on the same file can be compared, i.e. subsequent versions saved under different names. It is impossible to compare two files based on different source documents.

The option is available for an open document which you can compare with other open or selected from a location drawing.

Activation:

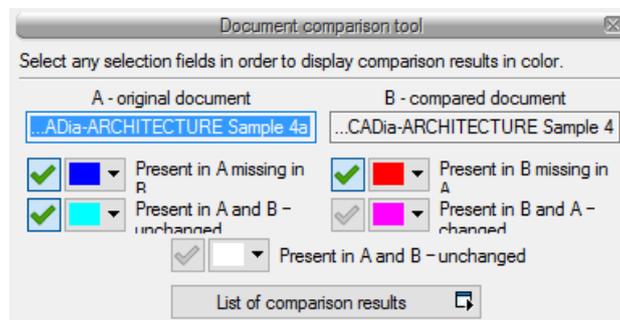
- *System* ribbon => logical group *File* =>  *Compare documents*



Drawing 50. Second compared document selection window

In the window presented above you have to select second file for comparison. If both documents are open, then, as presented above, list will show the name of the second document for comparison. If only one project will be open, then on the list there will be *<none>* and file for comparison should be selected using *Select file...* button.

NOTE: New file with both documents presented in a single view, will be opened. If any cross-sections or additional projections were inserted into any of the documents they will not be included in the comparison. Only the View 1 will be compared.



Drawing 51. Comparing documents window

A – original document – name of the primary open document including location path.

B – compared document – name of the document selected for comparing including location path.

Basics of Application operation

Present in A missing in B – elements of the project that can be found exclusively in the primary document of the comparison. During the next phase they were added to the primary document or deleted from the compared document.

Present in B missing in A – elements drawn in the second, compared, document, i.e. those that are not present in the first project selected for comparison because they were drawn in the second document or deleted in the first one.

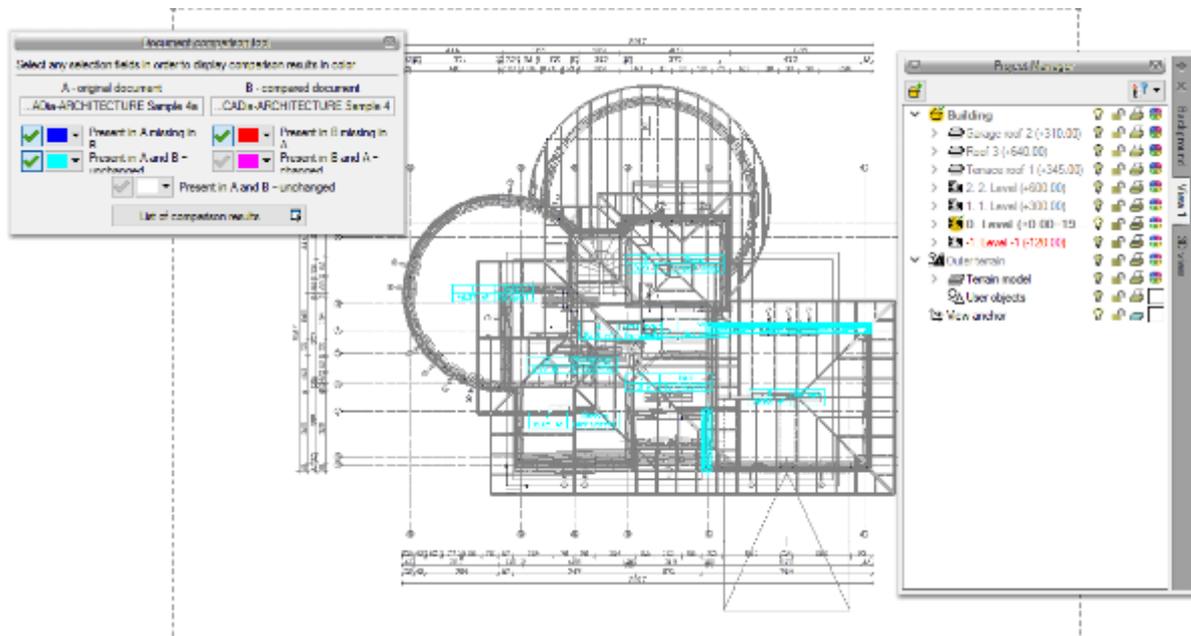
Present in A and B – changed – elements present in both projects but changed in one of the documents, elements are different with respect to location, size, or type parameters.

Present in B and A – changed – elements present in both of the projects but changed in one of the documents, elements are different with respect to location, size, or type parameters.

Present in A and B – unchanged – elements that are identical in both documents, unchanged in any way - unmoved, type not changed, etc.

List of Comparison results – window where all the elements from both drawing are displayed together with colour markings of the identical or changed elements.

Each of the above mentioned options has its own colours for the elements displayed. Colours can be changed but similar ones should not be chosen in order to avoid mistakes when comparing the documents.



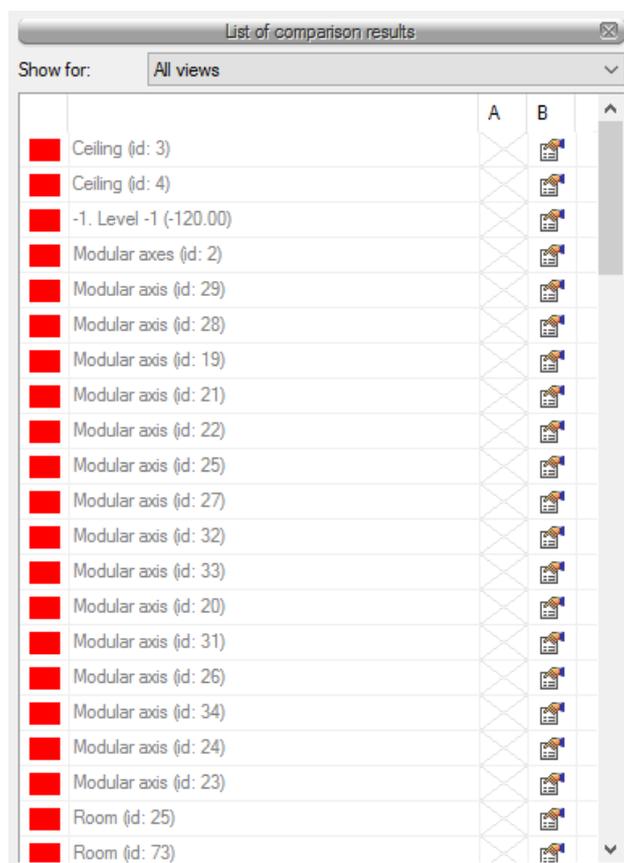
Drawing 52. Example of comparing documents

The example above shows the comparison of two documents where level one has changed.

Compared documents are opened on the same level, where primary drawing was opened. You can move between the levels in a standard way, in the *Project Manager* window. Additionally, *Comparison results list* can be helpful.

Basics of Application operation

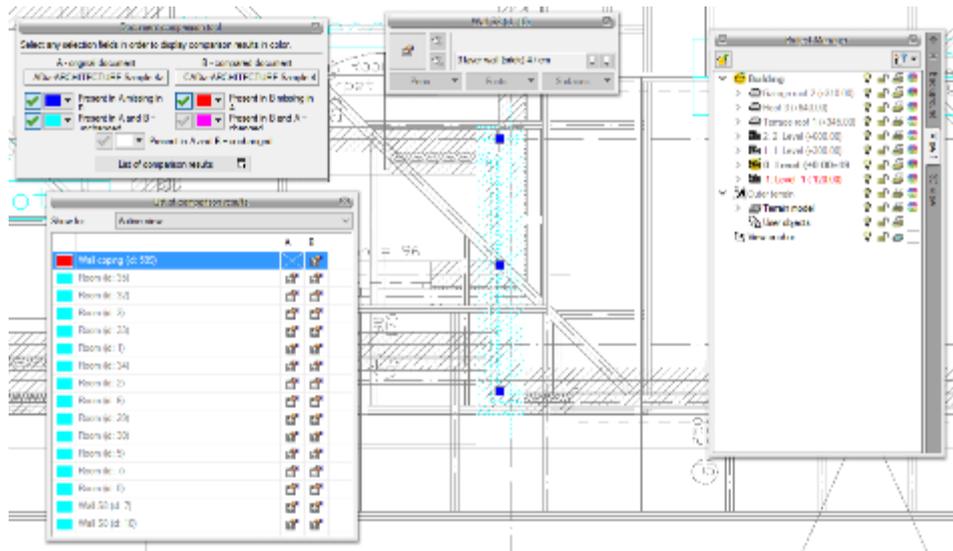
By default list displays *All views*, i.e. all elements of levels, roofs and external terrain. Active level is the one that you change in the *Project Manager*. If *Active view* will be selected in the *Comparison results list* window then the list of changes will include elements excluded from the active level, roof or external terrain (depending on which is selected in the *Project Manager*). Other items will not be displayed on the list. Displaying on the projection in the 3D view or the cross-section is still managed in the *Manager* window.



Drawing 53. *List of new and changed elements in the compared documents*

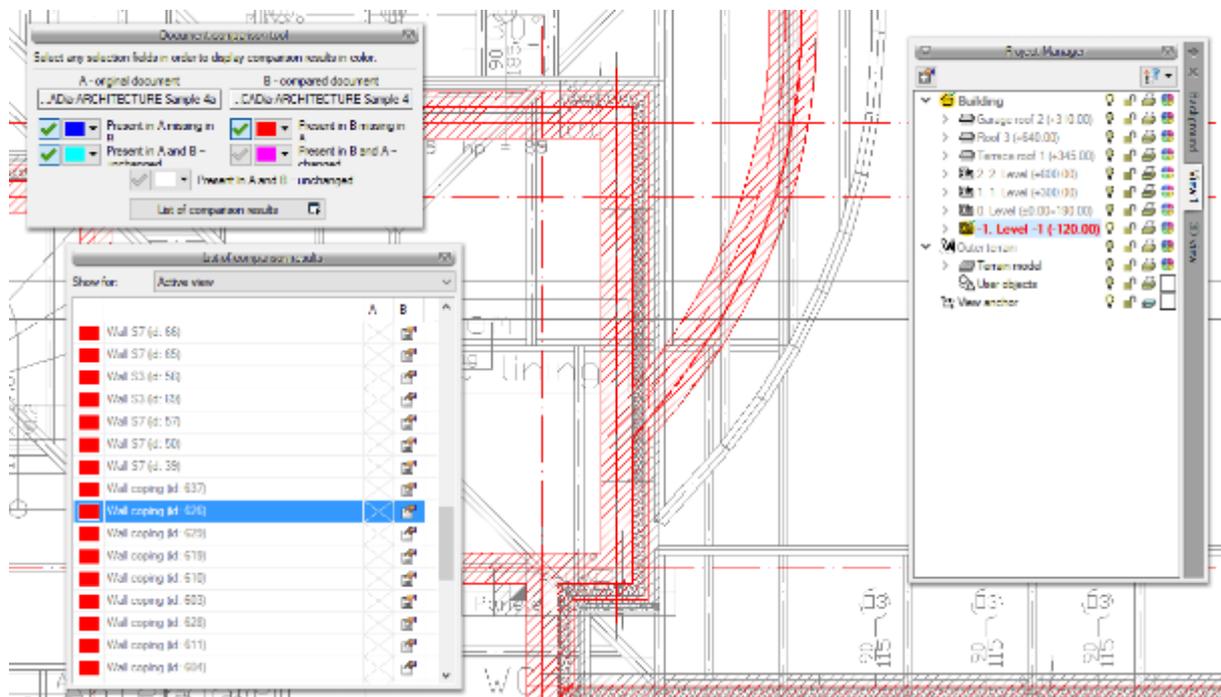
The list displays element name (e.g. wall, window, door), type symbol (e.g. O1, D4, S1), *Id* (displayed in the editing window after selecting an element) and access to the properties window. After selecting the element from the list the projection of the building will be moved, enlarged (reduced) to show on the projection where the selected object is located.

Basics of Application operation



Drawing 54. Sample selection from the list and automatic centering of the drawing

The changes in the document are best viewed if you select the fields *Present in A, missing in B* and *Present in B, missing in A* and elements change from one of the documents. In the example above new or deleted elements from other versions are visible in standard colours - red and dark blue. Additionally changed elements are marked in cyan (light blue). The elements which are drawn in grey are elements from inactive level or, as in the example, are changed versions of walls from the second document compared. If you selected option *Present in B and A – changed* then the walls marked in cyan will be changed into grey, and grey ones will change into pink showing the changes in the compared document.



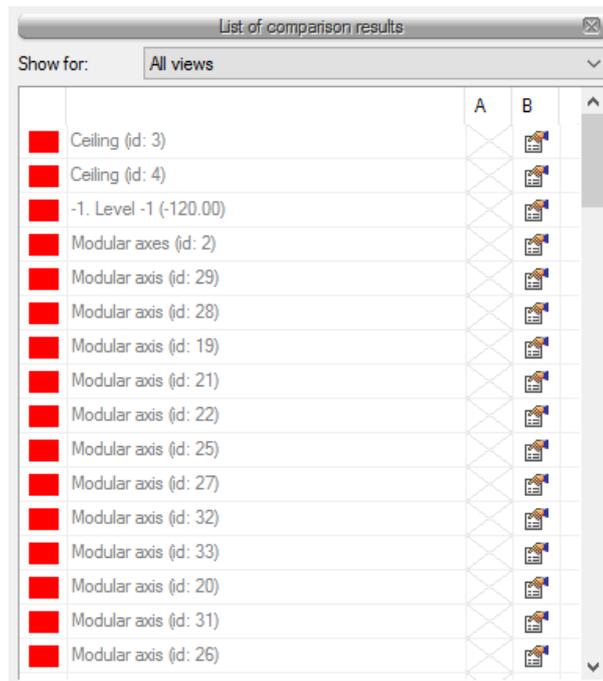
Drawing 55. Compared documents with changes from the document 2 visible.

Basics of Application operation

Changes can be viewed on the projection, 3D view, and on the comparative cross-section inserted in the document.

HINT: Only the elements of the ArCADia-START and ArCADia-ARCHITECTURE modules are compared now (elements of buildings and Benchmarks). Remaining elements of the system will be included in comparing different versions of the software. Additional elements such as lines, texts, etc. do not take part in comparison of the data.

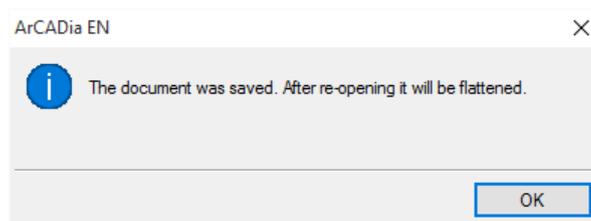
If storey height was changed in one of the documents, then during the attempt to compare the documents information about change of one of the levels will be displayed in the *Comparison results list* together with the information about the necessity to unify heights.



Drawing 56. List of changed and added elements in the second document.

During the comparison of the documents nothing can be changed and saved document will be flattened and will not have elements such as wall, window, etc. but only flat blocks. Currently the option *Compare documents* displays only changes in the documents, it is impossible to save or modify the drawings. In the first version it is only graphical display of changes.

If the window presented below will be displayed during the work, it means that autosave option was started and saved fill was changed into the flat document presenting changes. It bears no influence on further comparison.



Drawing 57. Autosave information

Basics of Application operation

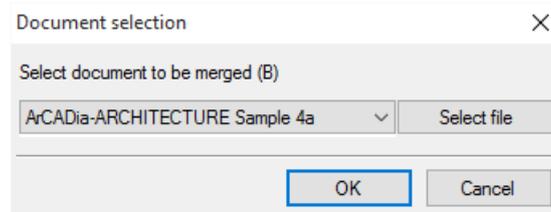
3.4. Merging projects

The possibility to merge projects between branches, i.e. loading projects from one branch to the file confirming projects in other branch, is a new option in ArCADia BIM system. This option is helpful for merging projects within a branch and checking the collisions between them, and during the design, when architect's project is changed and is send to a specialist who has his project partially or completely drawn. Until now it was necessary to insert again, e.g. sanitary or gas installation, again on a new project. Now all what is needed is to load the new version of the architecture and match the branch project.

Activation:

- *System* ribbon => logical group *Comparison* =>  *Merge documents*

After executing the command the window, where the user selects the document to be merged, is displayed.

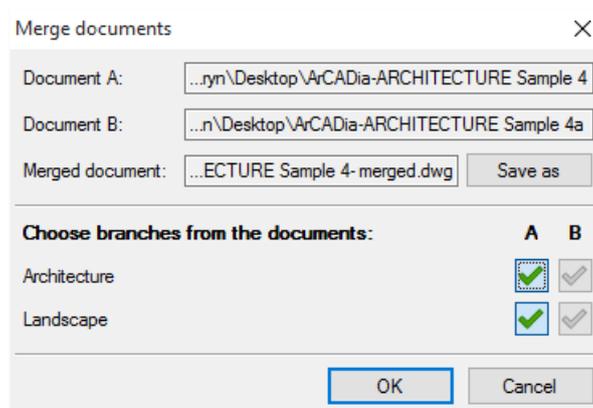


Drawing 58. *Selecting documents for merging window*

Document list displays open files which can be merged. If there is no file on the list, it should be selected by pressing *Select File*.

HINT! Only documents based on the same file can be merged, i.e. subsequent versions saved under different names. It is impossible to merge two different files crated basing on different source files.

After confirming choice another window appears, where you have to select branches, from which you want to add documents to the new file.



Drawing 59. *Merging documents window with default settings.*

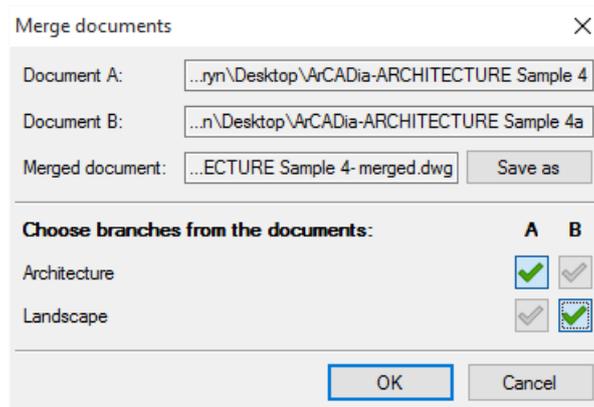
Basics of Application operation

Document A – primary project open, for which merging documents option was selected.

Document B – project open during merging the documents.

Merged documents – project which will be created based on the selection of branches from the lower part of the window. By default the project is saved in the same catalogue where document A is located, this location can be changed using *Save as* button and providing new location for saving the file.

Select branches from the documents – by default branches from the first selected documents are ticked (✓). This choice can be freely changed, or e.g. remaining branches, missing in document A, can be ticked. Selection of branch is done by clicking the icon: ✓.



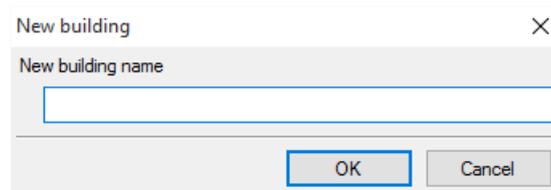
Drawing 60. *Change of branches is done in the merging documents window.*

NOTE:

Merging pertains to the project model. In the merged document views and the structure of the building will be transferred from the Architecture module, therefore it is important to select from which document it will be transferred. Additional views from the second document will not be transferred.

3.5. Buildings

Drawing an architectural or services project should start with creating a building. After inserting a View in a Project Manager window, icon  *Add new building* is added. Activating the option results in displaying of the following window:



Drawing 61. *New building window*

After confirming the name a building is created together with first level, with default name and other parameters.

Basics of Application operation

After selecting the building name from the tree in the *Project Manager* window, the following modification options are available:

Tab. 2. After selecting the building name from the tree in the Project Manager window, the following modification options are available:

	<i>Building properties</i>	Displays the <i>Properties</i> window
	<i>Add new building</i>	Adds another building to the drawing, displaying the window <i>New building</i> .
	<i>Delete building</i>	Deletes active building
	<i>Add new building</i>	Adds another building to the drawing and displays <i>New building</i> window.
	<i>Copy building</i>	Creates a copy of the building and inserts it into a selected location.
	<i>Mirror building</i>	Creates a mirror copy of the building.
	<i>Add level</i>	Adds another level in the building and places it above the active level and displays <i>Level properties</i> window.

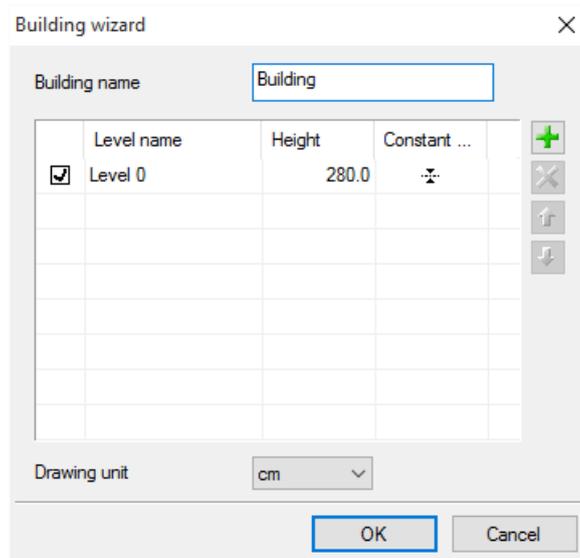
3.5.1. Building wizard

New version of the ArCADia BIM system software is equipped with option that helps in creating multi-levelled virtual building with one move. It defines the quantity, names, parameters of subsequent levels, and placement of the location view. For each level separate view may be introduced, as a result, levels may be displayed next to each other or one below the other, and not only one on top of the other.

Activation:

- *System ribbon => logical group Project =>  Building wizard*

After executing the command the following window will be displayed:



Building wizard

Building name: Building

	Level name	Height	Constant ...	
<input checked="" type="checkbox"/>	Level 0	280.0	±	
				
				
				

Drawing unit: cm

OK Cancel

Basics of Application operation

Drawing 62. *Window creating a building by means of defined levels*

Building name – the name of the inserted building.

Name levels – names of the levels (default Level 0), which can be defined by the user.

Height – storey height counted from the top edge of the raw ceiling to the top edge of the row ceiling.

Constant point – beginning view, location defined by the user as a view anchor of the level. Handle of the subsequent levels can be inserted next to each other or below each other, leaving the space for drawing project's projection.

Add (+) – add level below the lowest level. If the level is supposed to be above other level it has to be moved using the arrow icon Top ↑ .

Delete (X) – deletes the selected levels.

Top (↑) – moves levels one level above.

Bottom (↓) – moves levels one level below.

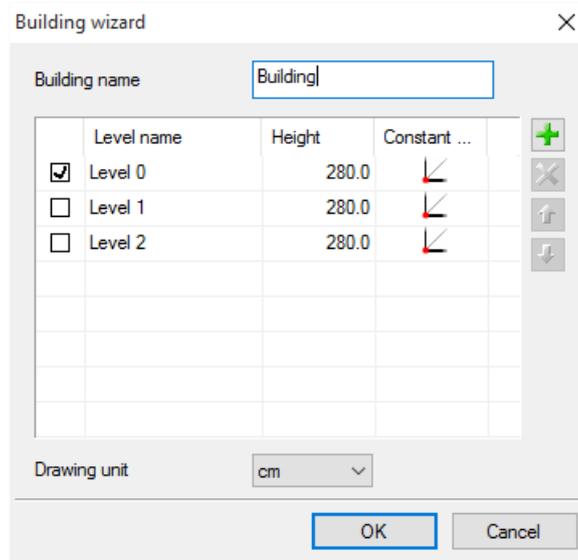
Drawing units – selection of the unit which will be used for drawing of the projection.

NOTE:

The column before the level name is responsible for the selection of a base level, that is the level which will be "0" level in the project.

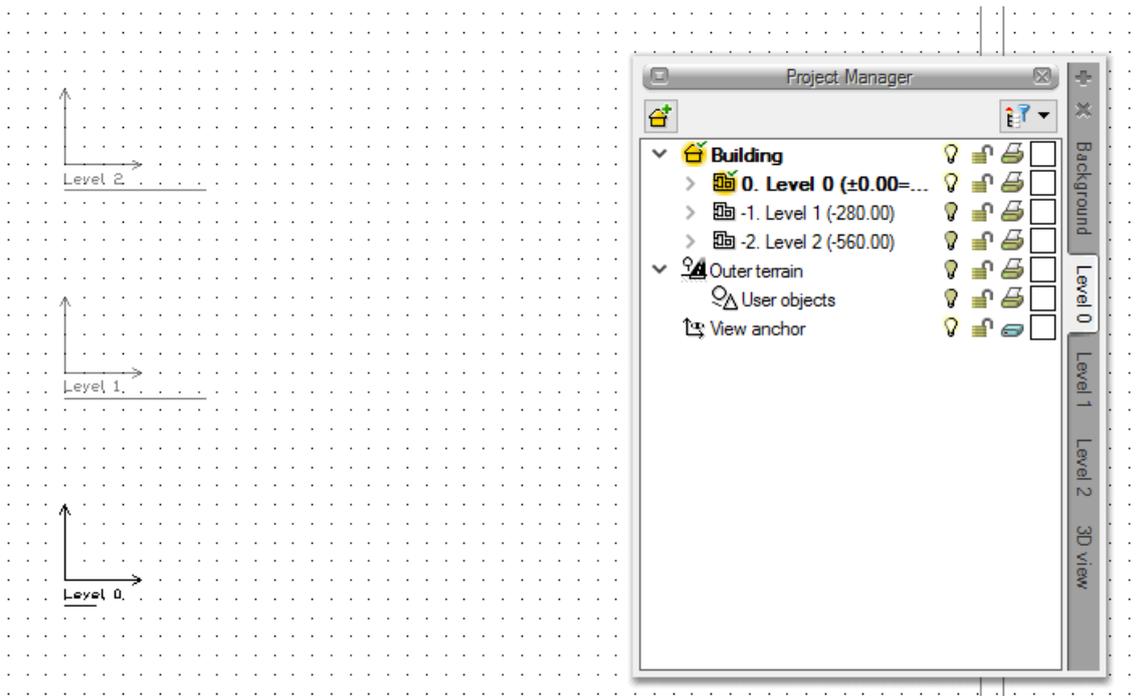
After defining the level and designating their location you confirm the window and move to the drawing of the project. *Building wizard* inserts only „layers“ of the levels, for which the user draws the project.. Level views will be displayed in tabs in the Project Manager window and their names will be the names of the levels. While working and moving to the designing another level you should switch using view tabs.

Basics of Application operation



Drawing 63. Sample task with three levels with different location of constant points in the creator window

When defining the levels in the window above constant points for every level where designated. After confirming the above mentioned window we will receive only the handles of subsequent levels.



Drawing 64. Sample task with three levels with different location of constant points

In the Project Manager window building tree can be seen, i.e. three levels and on the right side a tab which name is the same as the level’s name. For each view active level was defined, therefore to switch between the levels you need to switch views.

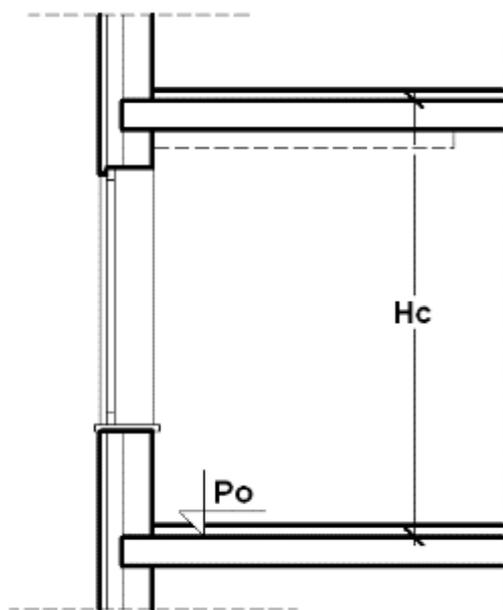
During the work with each view you can disable the visibility of the remaining levels leaving only the enabled bulb of the active level.

4.LEVELS

Levels

4.1. Levels

During drawing of the architectural layouts, ArCADia Application arranges the drawings dividing them into the levels. It is necessary to specify the base height (Reference level) and overall height. The level scheme is shown on the figure below.



Drawing 65. *Level data diagram*

Hc — Level overall height;

Po — Base height (Reference level);

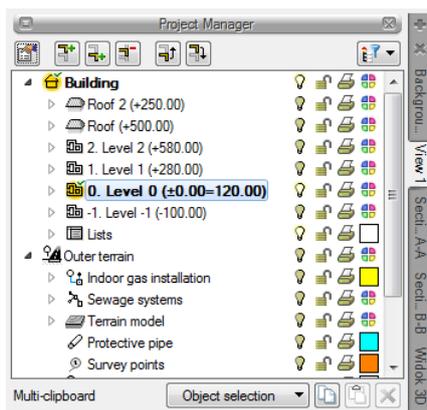
NOTE:

In order to begin designing using ArCADia Application, the project must have at least one level. If there is no level, during the first use of ArCADia tool, Level 0 will be automatically created.

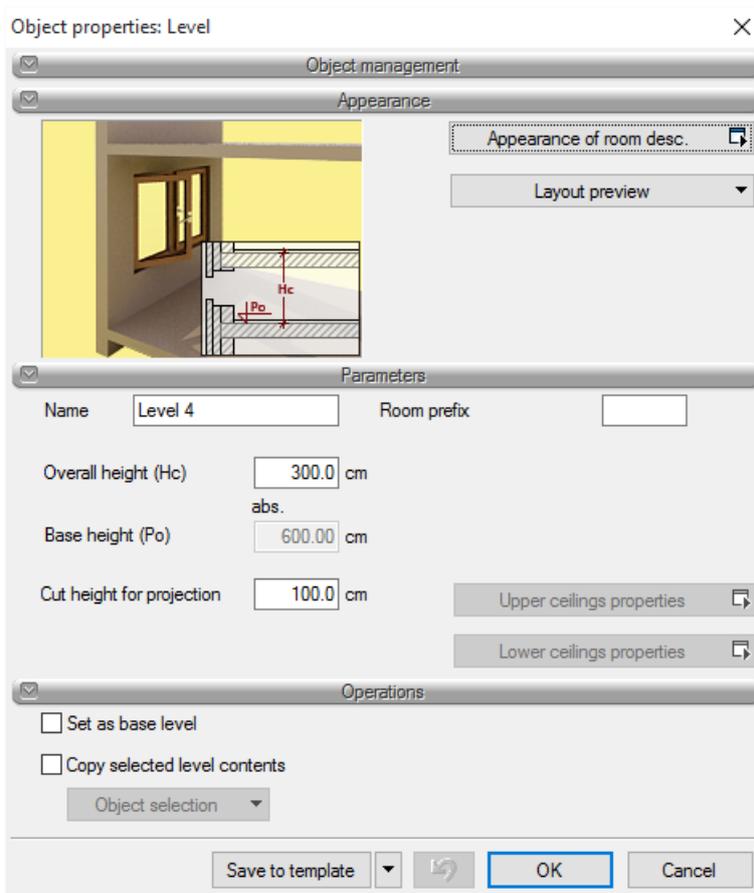
4.1.1. Inserting level

When you start working with the Application, after you insert the Layout and set the first building, the default level will be created with base height of 0 cm and level height of 280 cm. In order to access and set your own level settings, it is necessary to select the level name and choose the  icon located just above the building name.

Levels



Drawing 66. *Selecting the level from the manager window*



Drawing 67. *Level properties window*

Appearance of room description — the dialogue box for defining the table created automatically when you close the outline, i.e. when you create a room For more details see Section *Level description*.

Parameters — see Section *Levels*.

Levels

You can start working with the Application from any level: ground floor, foundations, attic or any floor. It is important to specify the appropriate *Base height* (Reference level), that will be shown in the Section.

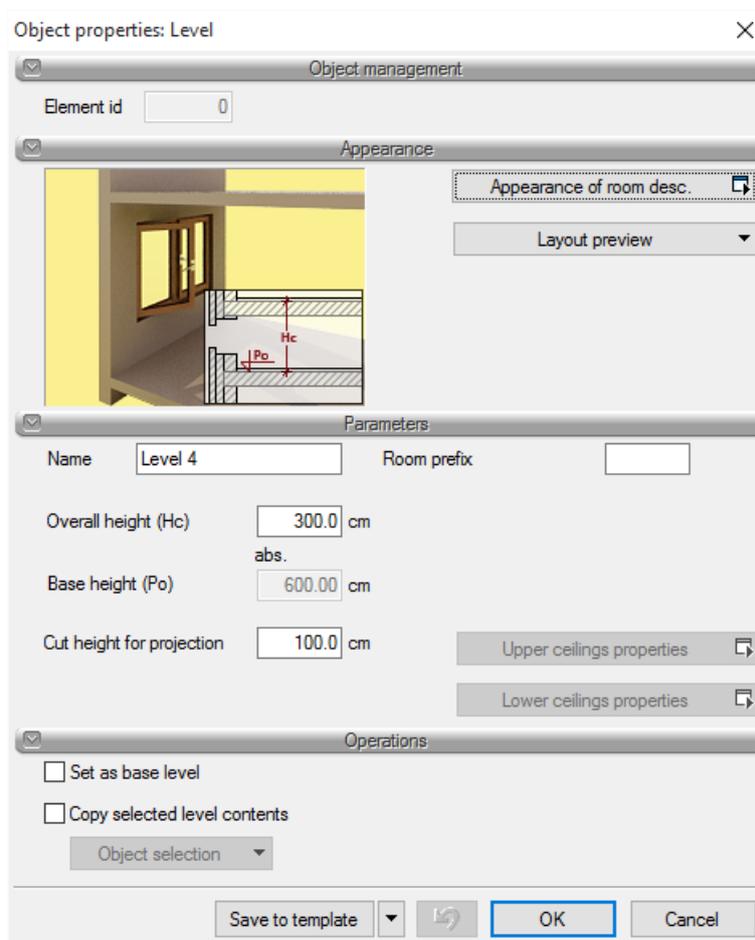
If there is no manually defined level, first run of command inserting an element into the level (e.g. wall) will automatically insert the level called *Level 0* with the default parameters.

The preview on the right side of the dialogue box reflects the interactions between the existing levels (marked with black colour) and already being inserted/edited level (marked with red colour). The changes of the base height and overall height made by user are automatically visualised in the preview.

The number of levels depends on the project that is being drawn. The limitations in this case are only the computer capabilities.

4.1.2. NEW LEVEL ABOVE

When you insert subsequent levels it is necessary to decide whether the level should be created below  *Add level below or above*  *Add level above* the active level.

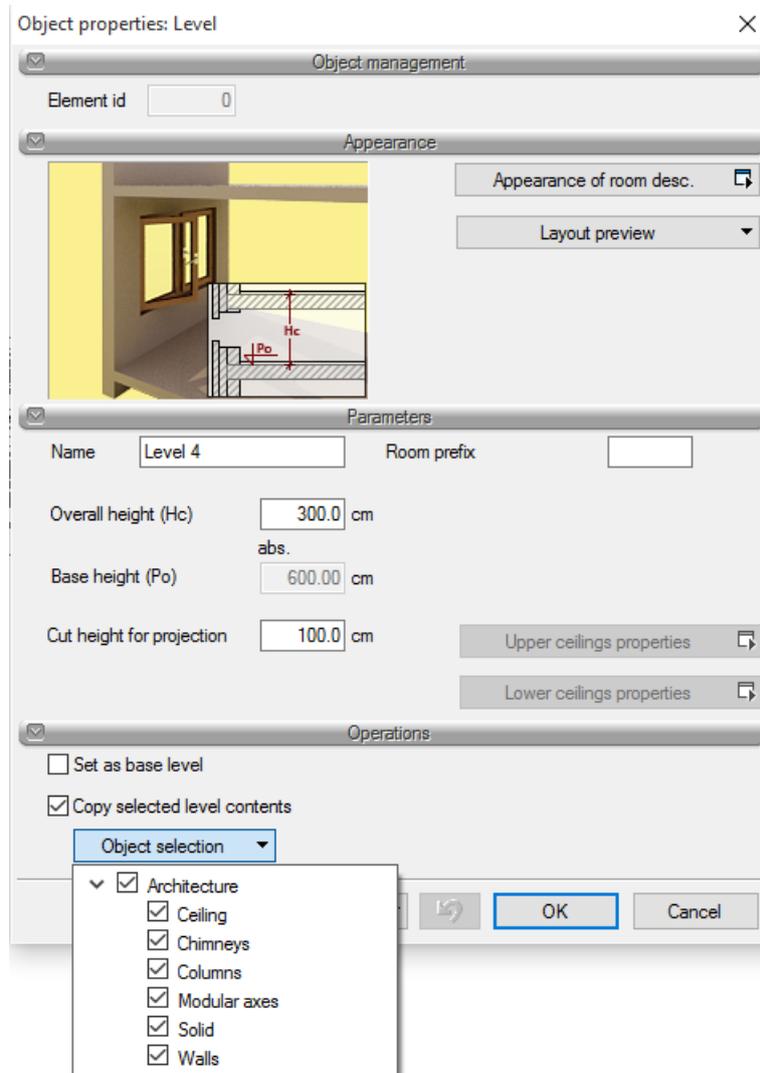


Drawing 68. *New level above active level properties window*

Levels

Operations — setting of subsequent level activates the panel designed for copying the contents of the current level and modification of the base level.

Copy selected level contents — allows you to select the group of level elements (from different branches, if they are used in the project) which are to be copied and inserted along with the new level.



Drawing 69. Copyable list of elements used on the active level

4.1.3. Displaying levels

By default, the Application allows you to work with only one level – the active one. The other ones (if they were inserted) are inactive and may be visible (as greyed-out, non-editable layouts) or may be invisible.

Each level can be set to visible/invisible regardless of its status (active/inactive). You can change the visibility of the level through Project Manager by clicking  [Show/Hide Level](#) icon.

Levels

4.1.4. Switching levels

The active level of the Application by default is the recently set level, which means that if you add one level, this level will be automatically activated. In case of several levels, you can switch between them, if needed, by means of *Project Manager* dialogue box through double-clicking on the level name.

The levels are displayed in the list in the sequence associated with their base heights – the lowest levels are located at the bottom of the list and so on. To change the order of the levels, use the following buttons:

 *Move level Up* or

 *Move level Down*

This will result in adequate change of the base heights.

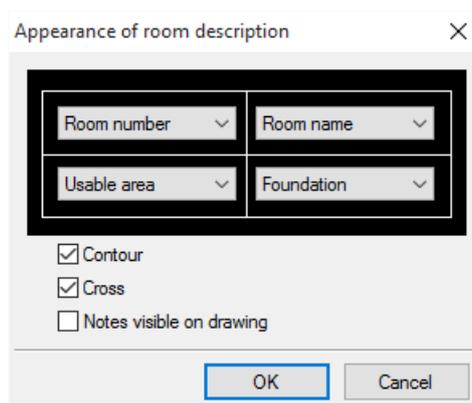
4.1.5. Deleting levels

In order to delete the level, use Delete level  button available in the upper part of *Project Manager* dialogue box.

This command deletes all elements of a given level, previously displaying the prompt box requesting the user to confirm the decision.

4.1.6. Level description

Rooms in the ArCADia Application are automatically described through the table inserted in the middle of the room. By default, the table contains the room number, its name, surface area and surface type (e.g. laminate flooring). The table appearance is available for the entire level and it cannot be changed for a single room. The table appearance and its element can be selected in *Object properties: Level* or *Rooms*.

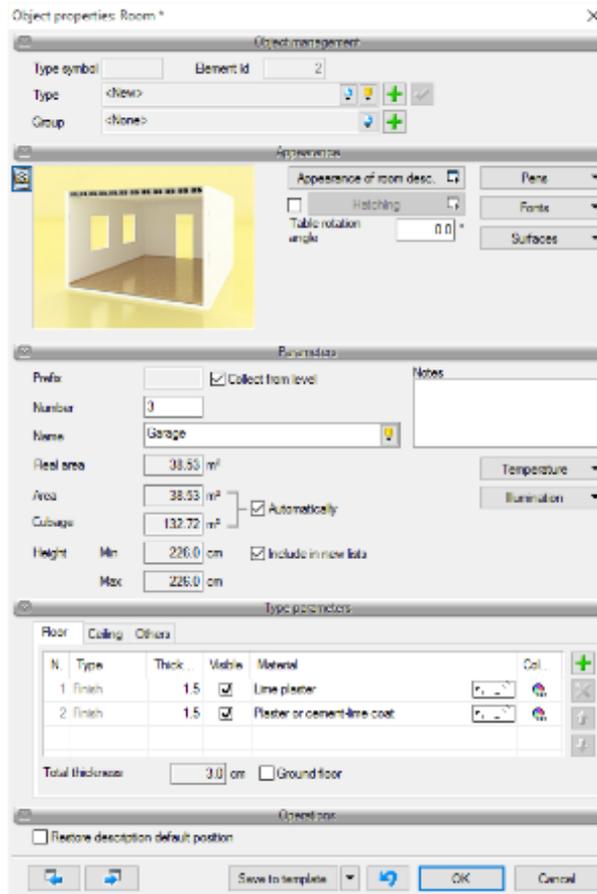


Drawing 70. *Room table appearance window*

4.2. Rooms

The room is inserted after drawing a closed outline of the wall. Its parameters: name, area, cubic volume, surface type can be defined in *Properties* dialogue box.

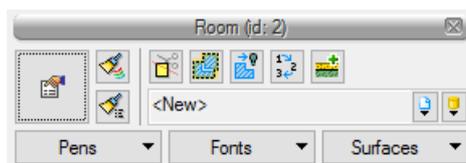
Levels



Drawing 71. Sample room properties window

To select the room, click on the description table. After selecting the room (in addition to the table, the outline of the room will be selected), the following modification options become available. You can use the above the window, where you can modify the room name, its number, what is on the floor and the ceiling and the room function (e.g. transport or residential) and fire protection class. If you select the room name from the available list, the temperature placed under the button on the right side will be assigned automatically. If you enter the room name, you have to specify the temperature and lighting. This information (apart form the list) is transferred to ArCADia-TERMO software and DIALux (calculation of demand for artificial lighting).

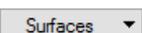
Other options of room modification are available from the below window available after selecting the room table.



Drawing 72. Room editing window

Tab. 3. Room modification tools

Levels

	<i>Go to Properties dialogue box</i>	Opens <i>Properties</i> dialogue box.
	<i>Font and pen painter</i>	Copies pens settings (line thickness and type) and type of the defined description font.
	<i>Type painter</i>	Takes over the parameters of the room type, i.e. applied materials and assignment to the group.
	<i>Cancel element trim to roof</i>	Deletes element trim, e.g to room or floor slab.
	<i>Join rooms</i>	Joins selected rooms, adding the surface areas and unifying the type (taken from the first room selected).
	<i>Explode rooms</i>	Explodes joined rooms to the originally created.
	<i>Hide room</i>	Hides description of the selected room by moving the room to <i>Hidden rooms</i> group.
	<i>Renumber rooms</i>	Changes automatic numbering of rooms.
	<i>Insert floor on ground</i>	Inserts the floor on the ground of given room.
	<i>Pens</i>	Definition of the type of the line used to draw the inserted element.
	<i>Fonts</i>	Definition of the size and type of the font describing the element.
	<i>Surfaces</i>	Assigning materials or textures to the particular surfaces of the inserted element.
	<i>Type</i>	Element types and icons <i>Global library</i> and <i>Document library</i> .

4.3. Terrain

To reflect the project better, both in the 3D view and the cross-section, or to present the network design, you can introduce an area plane by means of spots height. These spots height give you the possibility to freely shape the terrain relief by accurately reflecting the factual conditions of the site where the designed building is to be erected.

Levels

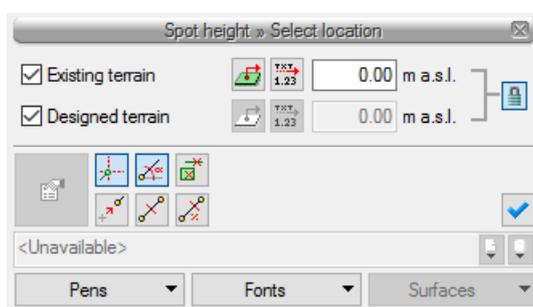
As of now, ArCADia BIM system provides new features for the terrain, dividing it into the existing terrain and designed terrain. This is the prequel to a new feature, which will be provided with additional specialized functionalities in subsequent software versions.

The terrain may be shaped with the following features: *Insert spot height* and *Spot height line* by inputting the relevant data or reading it from the drawing text.

Activation:

- *Architecture* ribbon => logical group *Supplementary elements* =>  *Insert spot height* and  *Spot height line*

Once the option is selected, a spot height dialogue box is displayed.



Drawing 73. *Inserting Benchmarks dialog box*

Existing terrain – turns the existing terrain ordinate for this spot height on or off and deactivates (greys out) the controls: for introducing values, the button  *Take value from text* and the check box *from the area* relevant for this ordinate.

Synchronize values  – turns the editing field *Designed terrain* on or off, taking over (or not) the values from the *existing terrain* field.

NOTE: This button is only available in a situation where the two check boxes *Existing terrain* and *Designed terrain* are checked.

From area – when it is turned on it deactivates the control for introducing the area altitudes for the existing/designed terrain respectively. The software reads the real/designed ground surface height from underneath the mouse cursor or the snapping points and inputs the read value into the control. Should the mouse cursor be outside the real/designed ground surface, then the value fed into the control is 0.00.

Designed terrain – similar to the *Existing terrain* field.

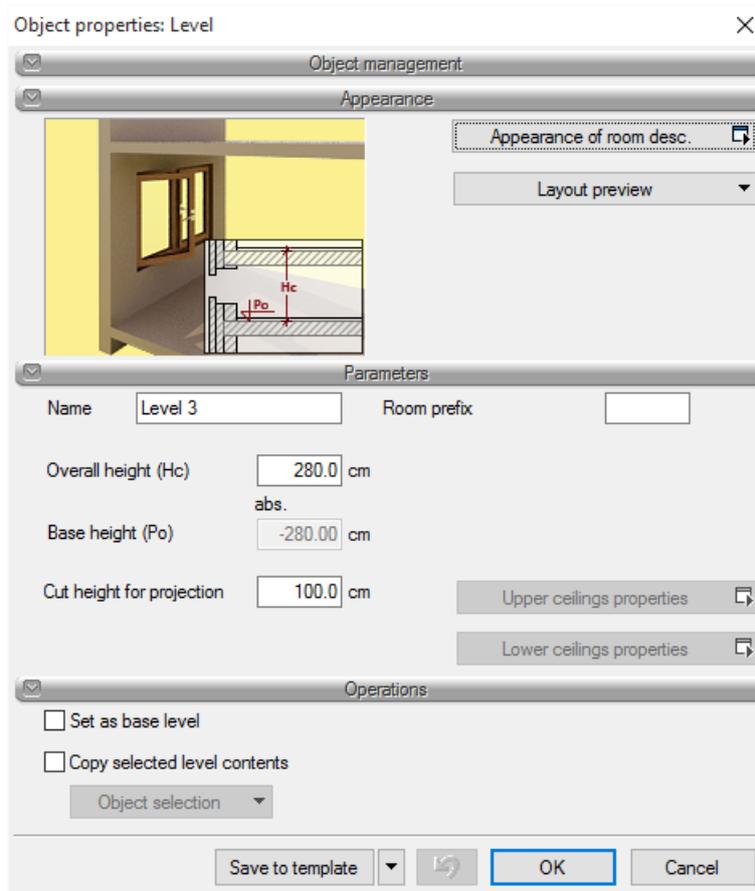
After the value is entered the spot height line or spot height are inserted, respectively. The more spot height, the more detailed the terrain relief.

Levels

NOTE: In order to adjust the Terrain point height to the building embedment it is necessary to remember that the building location is defined by the Absolute base height, i.e. the above sea level height defined for the base level (usually the first defined level).

For example:

A building where the ground floor is located at a height of 240 m a.s.l. is elevated against the terrain by 25 cm.

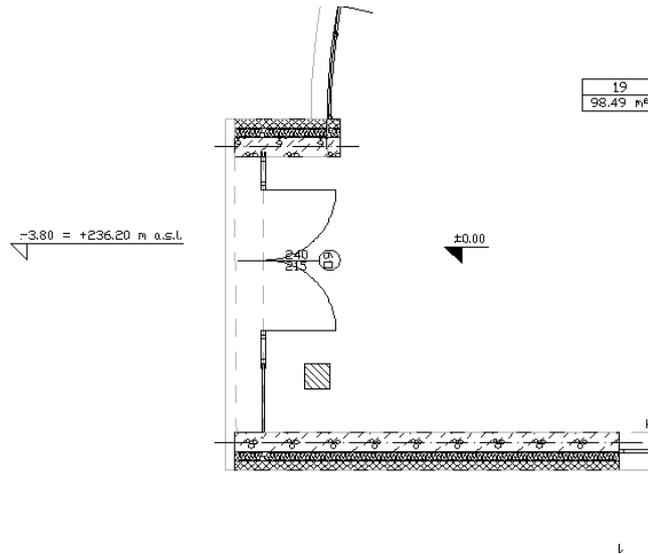


Drawing 74. Level properties dialog box

Data is entered for the base level, where 0.00 of the building (ground floor) is 240 m a.s.l. Whereas for the designed terrain you'd indicate for the benchmarks that they are at 239.75 m a.s.l., i.e. 25 cm lower.

NOTE: If the spot height is to indicate the terrain ordinate, you need to enter this after switching to the External terrain in the project tree of the Project Manager.

Levels



Drawing 75. *Sample project with height description*

4.3.1. Inserting spot height

Prior to inserting points you need to determine their height and then indicate the designated location.

Activation:

- *Architecture* ribbon => logical group *Supplementary elements* =>  *Insert spot height*

The inserted benchmarks are represented on the drawing as in the image presented below.



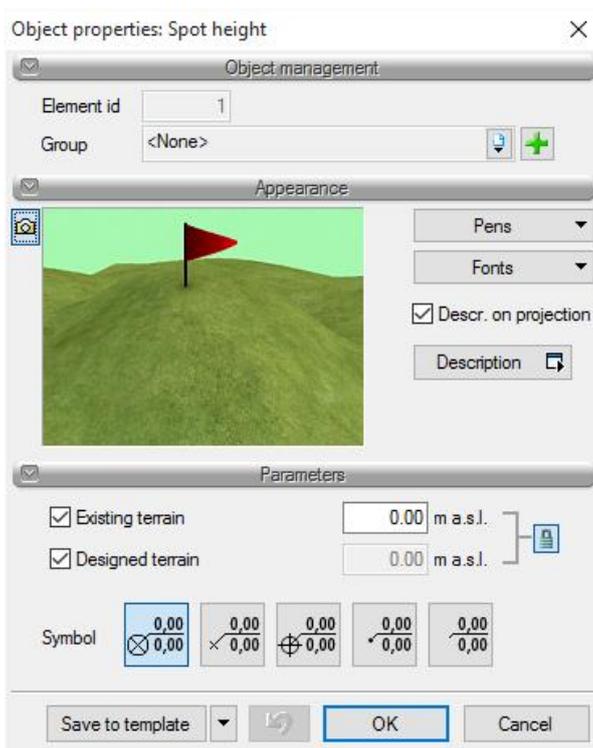
Drawing 76. *Benchmark for on the drawing*

After calling the option you can insert benchmarks with different heights, changing these as needed in the *spot height* window for the designed or existing terrain.

The more spot height there are in the projection, the more detailed the shape of the designed terrain will be.

Each spot height may be re-edited, changing its height or e.g. panning it. Below you can see the *Item properties: Benchmark* window.

Levels



Drawing 77. *Spot height properties window*

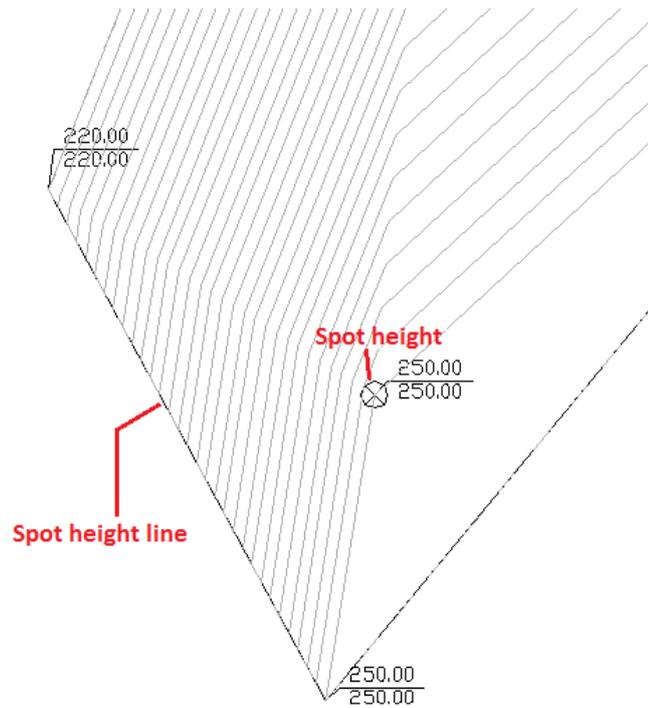
4.3.2. Inserting spot height lines

Prior to insertion you need to indicate the height of the first spot height for the existing terrain and the designed terrain (or only one value using the *Synchronize values* option), select it and then, if the second spot height is located in another height, you need to indicate the appropriate value and insert the last point on the line.

Activation:

- *Architecture* ribbon => logical group *Supplementary elements* =>  *Spot height line*

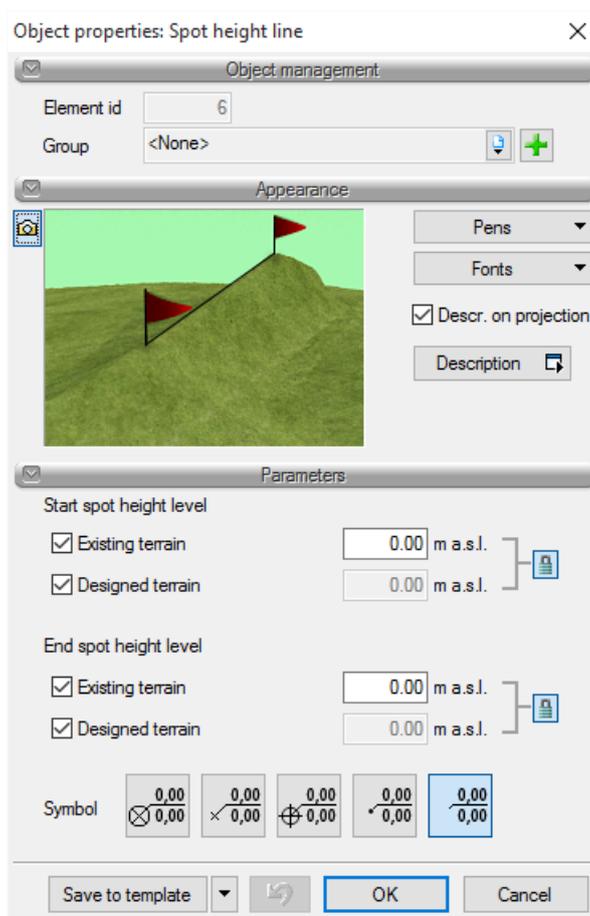
Levels



Drawing 78. *Terrain elements on the projection*

Editing the spot height line is similar to editing spots height. You can change the values for the existing/designed terrain, move the line points or divide the points.

Levels



Drawing 79. *Benchmark line properties window*

4.3.3. Cut in the terrain

An opening in the terrain can be done in two ways: by defining its shape or by allocating the shape to the projection of the building. Second option allows for automatic cutting of the opening in the terrain of the same shape as the lowest level (if the terrain is active) or level on which we execute this operation.

Activation:

- *Landscape* ribbon => logical group *Landscape* =>  *Automatic cut in the field*

4.3.4. External objects

The outside objects are meant to simulate the elements existing in the terrain that may collide with the elements of the designed documentation. An *Outside pipe* may simulate elements of different electric installations, gas installations, etc., whereas an *Outside object* may simulate an existing building, fence, manhole and similar elements in a design.

4.3.4.1. External pipe

An *Outside pipe* is an element that simulates different networks in the terrain. It may be used in the design to verify collisions, reflect the existing networks in the different views, along with a profile.

Levels

Activation:

- *Architecture* ribbon => logical group *Supplementary elements* =>  *Outside pipe*

4.3.4.2. External object

An *Outside object* is used to simulate different objects in the terrain. It may be used in the design to verify collisions and reflect the existing items in the terrain in the different views, along with a profile. It may have the shape of a cuboid or cylinder.

Activation:

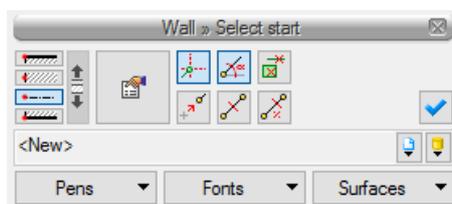
- *Architecture* ribbon => logical group *Supplementary elements* =>  *Outside object*

4.4. Inserting ArCADia BIM objects

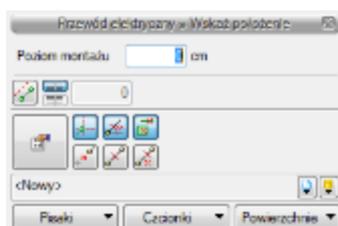
4.4.1. Insertion bar

In order to facilitate the insertion of elements: selecting a handle for insertion, accessing the *Properties* and type, an *objects insertion* toolbar was created.

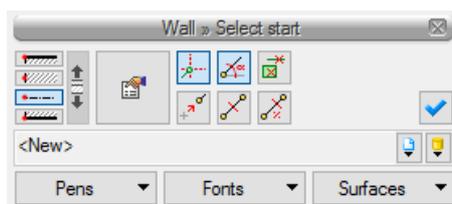
An example toolbar that appears when inserting a *Wall*:



Drawing 80. Example of window displayed during the insertion of the *Wall*



Drawing 81. Example of window displayed during the insertion of the *Electric Wire*

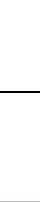


Drawing 82. Example of window displayed during the insertion of the *Water Pipe*

Levels

A detailed description of the functions is included in the help files available in modules, below there is a description of the options present when introducing most elements of the system.

Tab. 4. Options located in the inserting window

	<i>Go to Properties dialogue box</i>	Opens the <i>Properties</i> window for an item, e.g. <i>Wall</i> , Electric Wire, Water Pipe
	<i>Tracking axes</i>	The option displays horizontal and vertical straight lines directed from the detected points to the inserted elements. If the option will detect an edge of the inserted element it will display a straight line extending the detected edge.
	<i>Tracking angles</i>	This option displays the selected angles set from the existing elements in the project.
	<i>Detecting elements</i>	This option detects edges and points of the inserted elements
	<i>Reference</i>	Enables inserting a selected element in the selected distances from the indicated point.
	<i>Between points (centre)</i>	Enables inserting an element in the middle of the indicated distance.
	<i>Between points (percentage)</i>	Enables inserting elements with a percentage division of the selected section.
	<i>End of command</i>	Completes the insertion of an object, e.g. a <i>Wall</i> .
	<i>Type</i>	Save set of features common for many objects of the same type (elements template defined by the user).
	<i>Type</i>	The saved set of features saved for many items of the same style (user defined element template).
	<i>Global library</i>	Type library is provided with the software and extended by <i>User library</i> where the user can save and store element types created by him for use in future projects.
	<i>Close</i>	Exists the options without inserting an element.
	<i>Pens</i>	Definition of the type of the line used to draw the inserted element.
	<i>Fonts</i>	Definition of the size and type of the font describing the element.

Levels

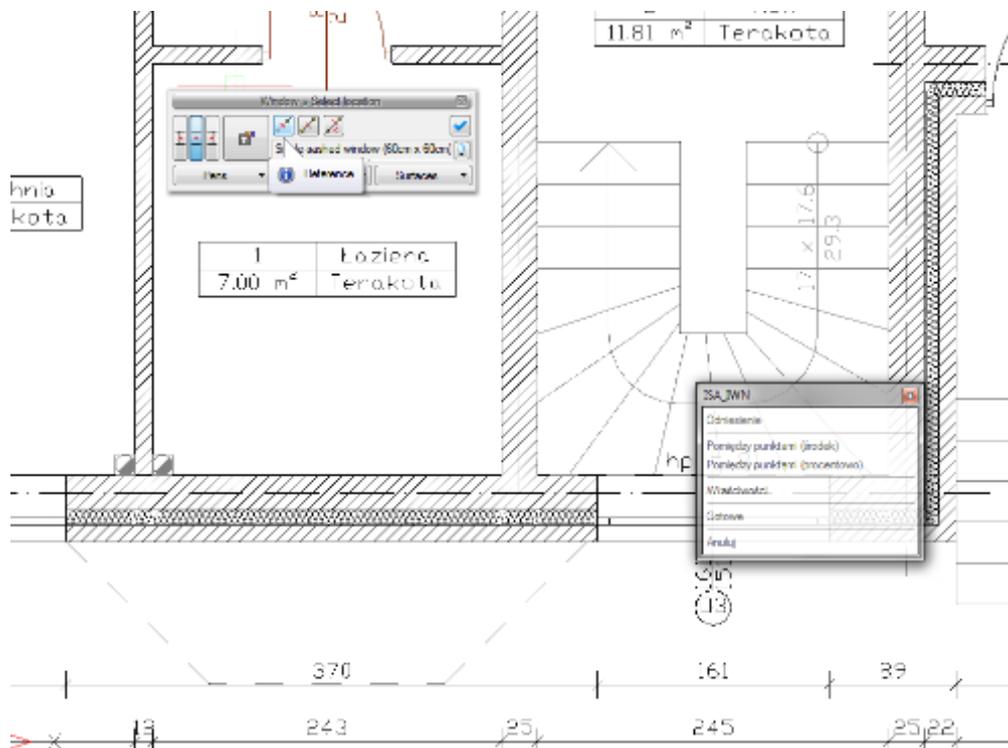
Surfaces ▾	<i>Surfaces</i>	Assigning materials or textures to the particular surfaces of the inserted element.
------------	-----------------	---

4.4.1.1. Reference

Reference is a feature that enables inserting a selected element in the selected distances from the indicated point. This feature is perfectly suited for inserting windows and doors in a pre-determined distance from the wall or another window and also for drawing rooms with pre-determined sizes.

For example:

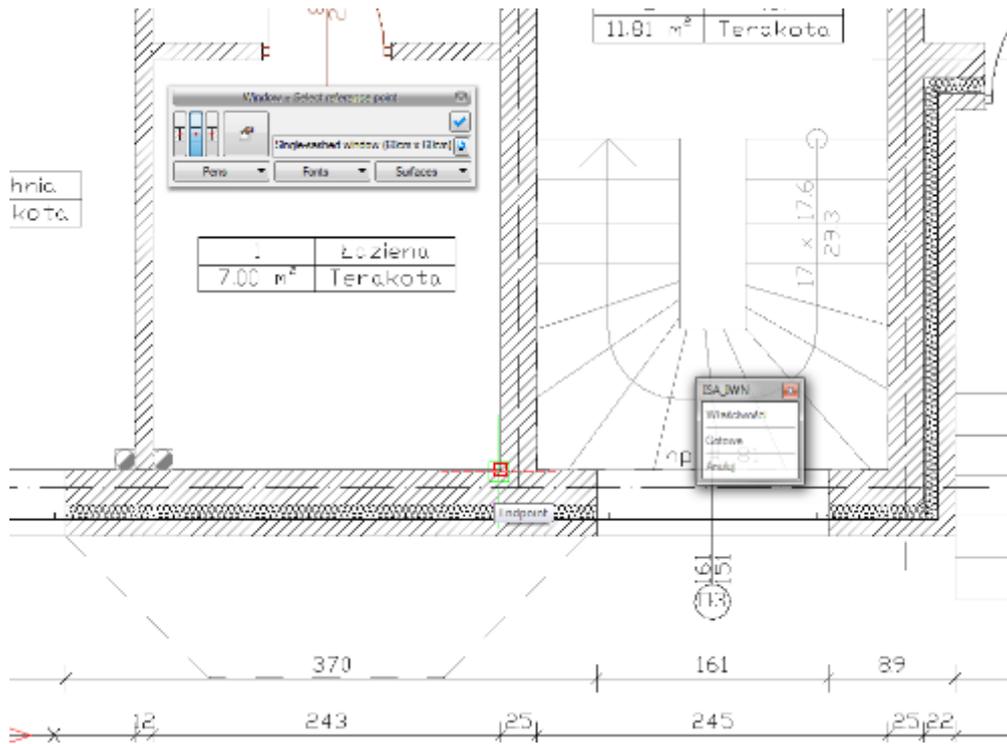
You want to place a window at a distance of 65 cm from the internal corner of the room. To do that you select *Insert window*, then you select or determine the type and click *Reference* located in the insertion toolbar, the reporting window or command area.



Drawing 83. *Enabling the reference options*

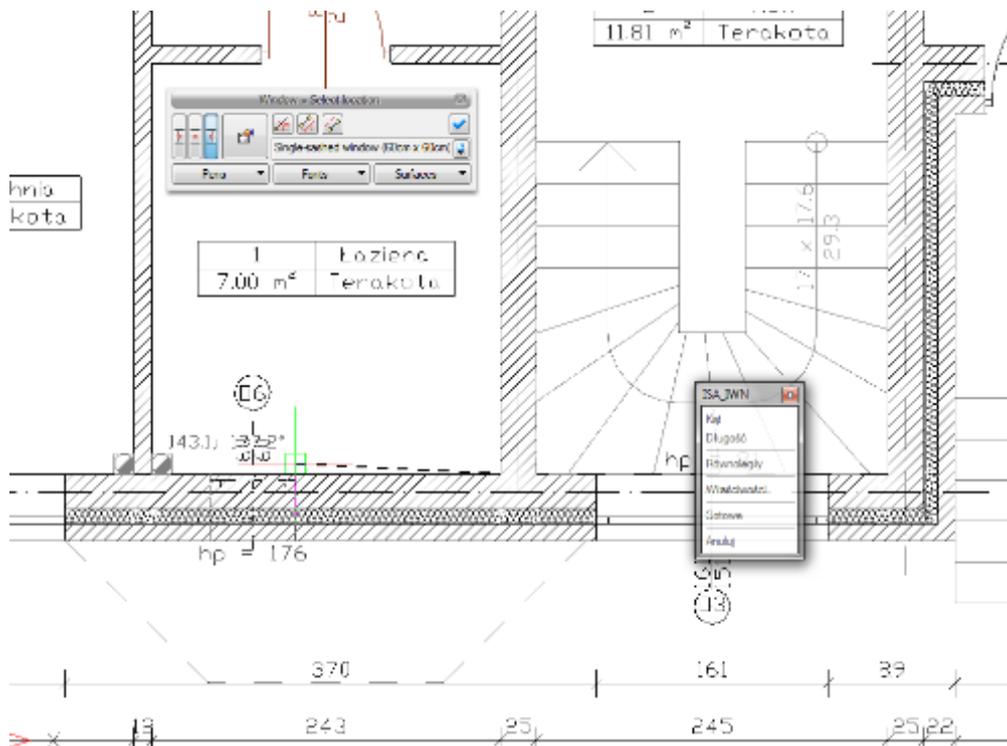
Then you indicate the location from which the 65 cm will be measured, that is the corner of the room.

Levels

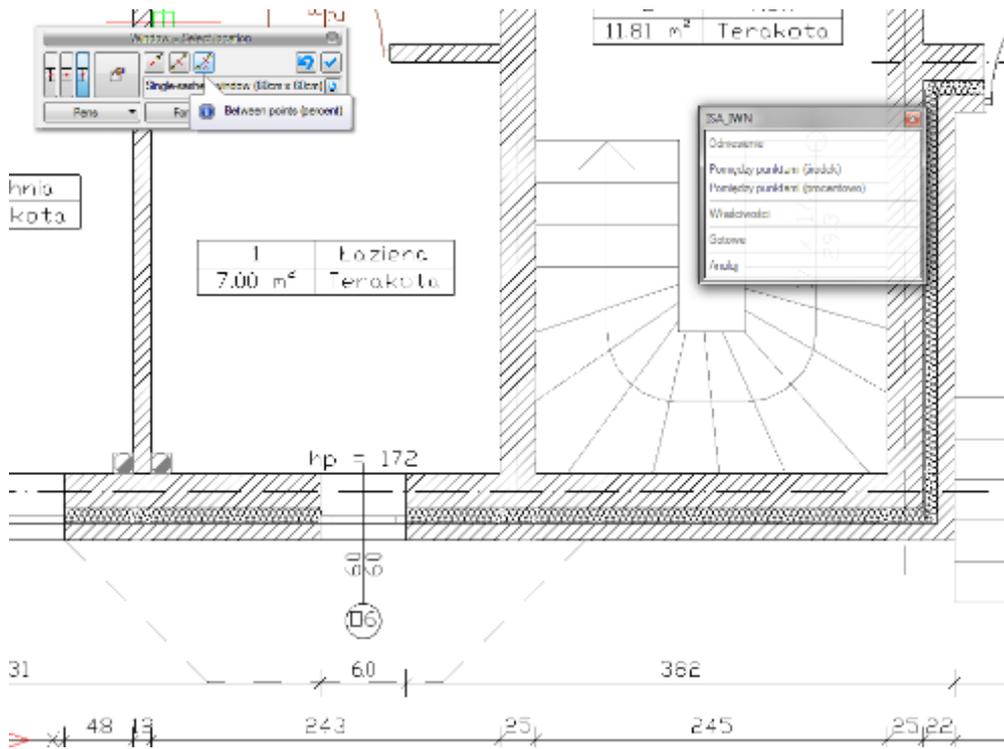


Drawing 84. Setting the reference point

By default the windows are inserted with the centre, which is the symmetry point. When inserting a window with a *Reference* you will need the closest window edge. To obtain this you need to select the proper handle in the *Window* toolbar. In order to verify whether the correct edge was indicated, you need to verify the ruler up to the insertion point in the projection. If the ruler goes through the window, this means that you should select another edge. The drawing below presents the correct arrangement.

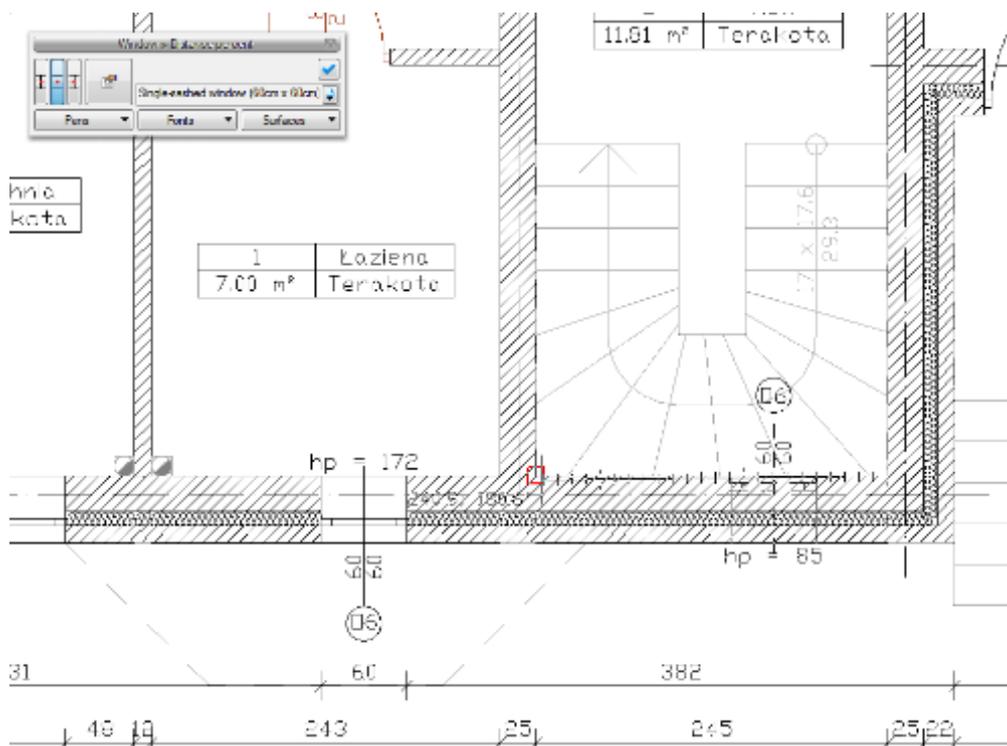


Levels



Drawing 87. Selection of inserting options

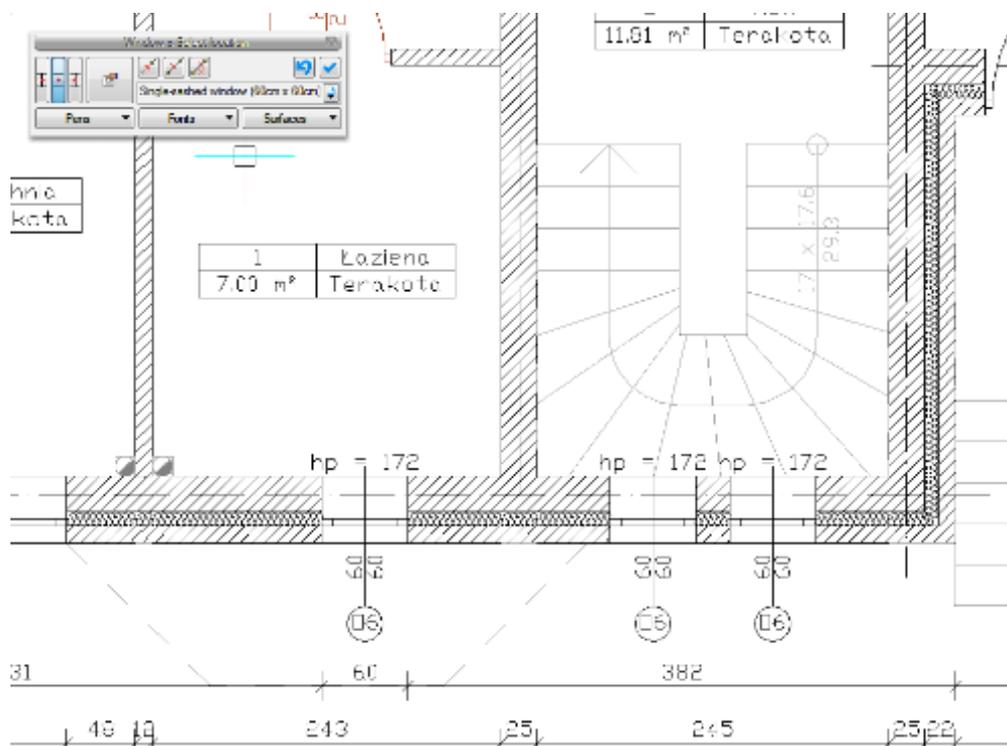
you need to provide the distance percent in the reporting window or command area, which in this case would be 33. Indicate the beginning and end of the wall.



Levels

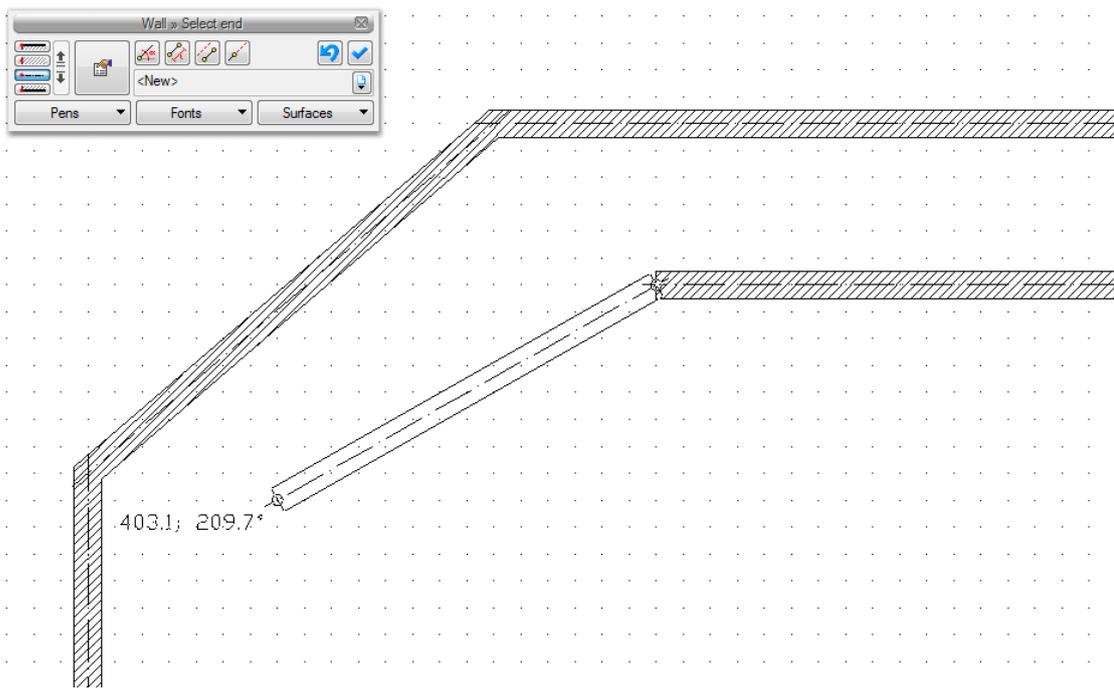
Drawing 88. *Designating the insertion section*

Then insert the second window same as before, this time indicating the end and then the beginning of the wall, this way arriving at the effect presented below.

Drawing 89. *Inserted Windows***4.4.1.4. Parallel**

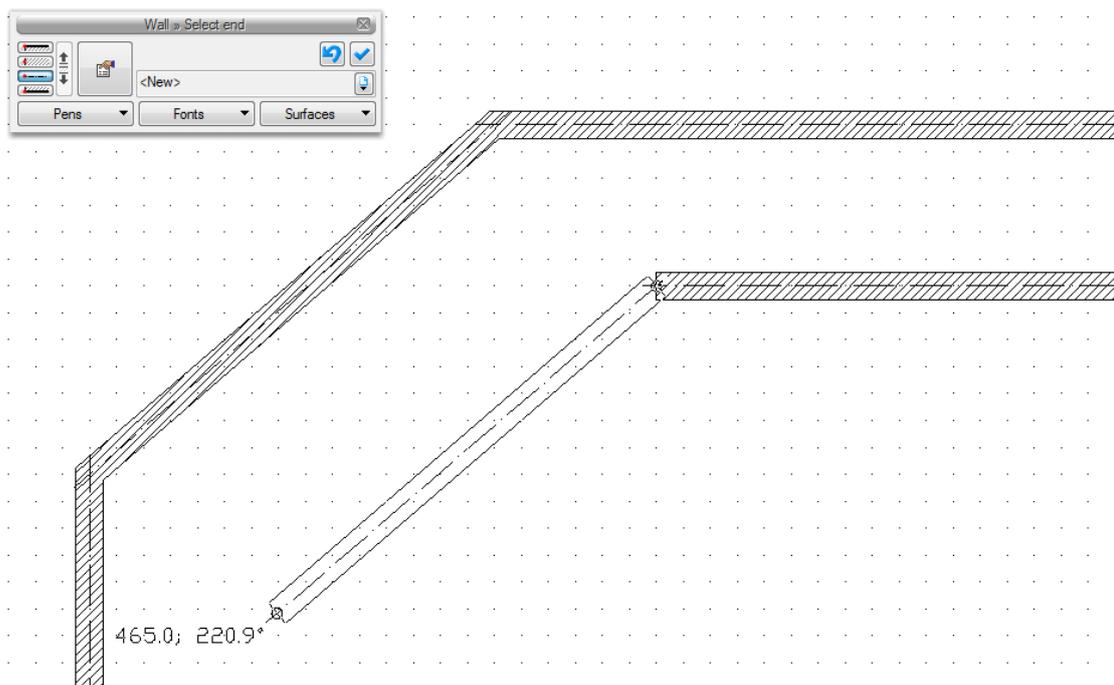
The *Parallel* option is activated in a slightly different way than the insertion aids described above. In order to draw a wall parallel to an existing one you need to activate the Insert wall option, then indicate the beginning of a wall and only then will the Parallel  option become available in the insertion toolbar.

Levels



Drawing 90. *Drawing a parallel wall*

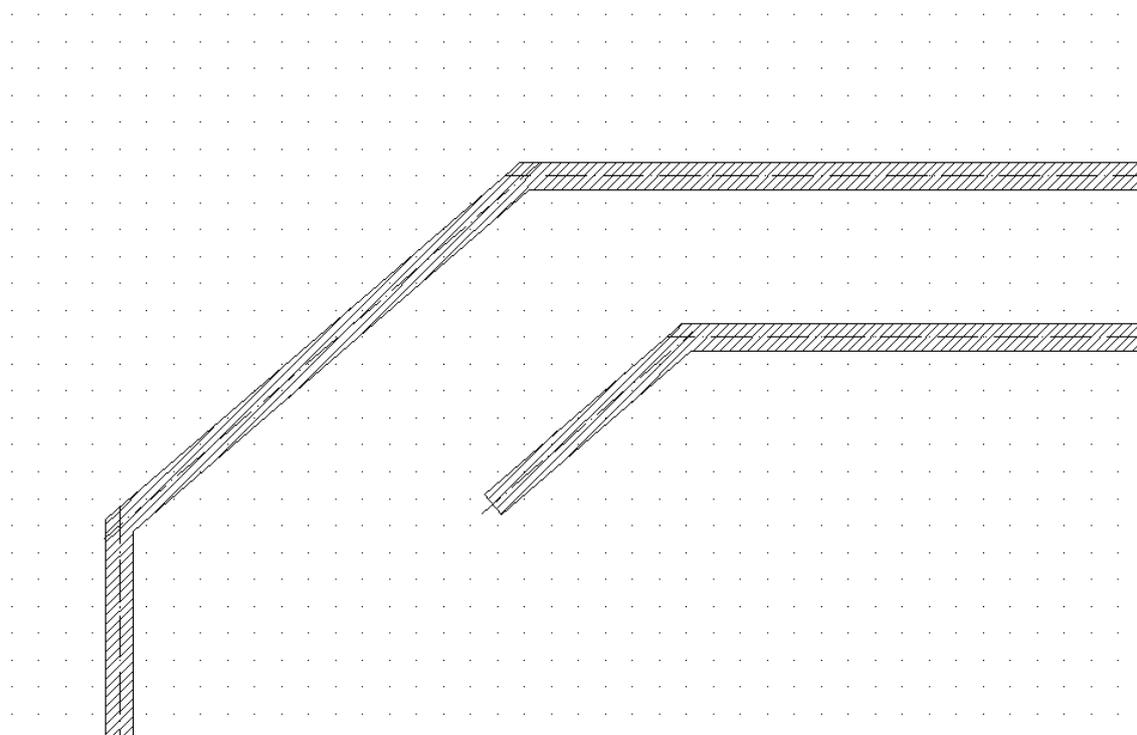
Once this option is activated you need to indicate two points of the wall to which you want to add a parallel wall.



Levels

Drawing 91. *Designating the parallel reference*

The software will lock the insertion angle, which is the time when you need to indicate or determine the wall length.



Drawing 92. *Two Parallel walls*

4.5. Edition window

Wall system elements introduced in the projection can be modified using the edition window option:

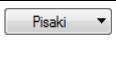
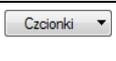


Fig. 5. Wall edition window

Tab. 5. Available wall edition tools

	<i>Properties</i>	It opens the <i>Properties</i> window.
	<i>Font and pen painter</i>	It takes over the marker settings (thickness and types of lines), as well as the size and the type of the font.

Levels

	<i>Type painter</i>	It takes over the type of the wall, the layout and thickness of layers and moves them to the selected walls.
	<i>Extend/trim the wall</i>	Changes the length of the selected wall.
	<i>Split the wall</i>	Divides the wall at an indicated place.
	<i>Reversed layers order</i>	<i>Changes the locations of layers.</i>
	<i>Cancel element trimming to roof</i>	Removes wall trimming with the ceiling or roof.
	<i>Extend up to this wall</i>	Extends the indicated walls to the originally marked one. You extend only the walls which meet the wall to which they are extended.
	<i>Shorten to this wall</i>	Shortens the indicated walls to the originally marked one, by shorter sections going beyond the marked wall.
	<i>Delete marked objects</i>	Deletes the selected elements.
	<i>Type</i>	The saved set of common features for many objects of the same type (template przez elements defined by the user).
	<i>Document library</i>	Consistent with the selected template and created along with the development of the drawing when saving next types.
	<i>Global library</i>	Type library provided along with the software and extended by <i>the User library</i> where you can save own types of elements for their use in next projects.
	<i>Close</i>	Leaves the option, not changing the element.
	<i>Markers</i>	Definition of the type the line used for drawing the introduced element.
	<i>Fonts</i>	Definition of the size and the type the font describing the element.
	<i>Surfaces</i>	Assignment of materials or textures for particular surfaces of the introduced element.

4.6. Working with types

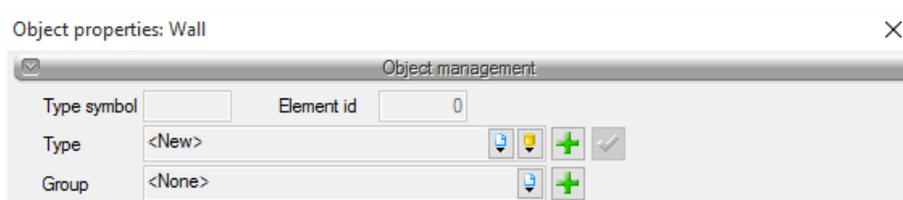
Some ArCADia items, such as a wall, windows, doors and openings work with a type library. The element type is a saved set of features common for many items of the same type. For example, the wall type stores information about the number, type of layers, etc. A type is saved under the name provided by the user. By default the items do not have a type assigned to them, unless the user selected a type from the library when introducing an item.

There are two types of type libraries:

- *Document library* (saved with the document) – it allows transferring types along with the document.
- *Global library* (saved on the computer in the user's folder) – it allows transferring types between documents.

Levels

If an item works with an item library, the *Object management* panel is available in the upper part of the *Properties* dialogue box for the item.



Drawing 93. *Type manager when no type is active.*



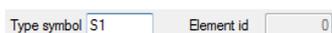
Drawing 94. *Type manager when a type is active.*

The available options include:

Type — to be selected from a drop-down list. A list of the types previously used in the document is also available. After selecting a type from this list the item properties are changed to match the ones set for the type. The type name will appear on the bar.

 (*Add new*) — creates new type based on presently active object features. The user is asked to give a name to the type and to save it to the global and (or) document library. Saving type to the global library will allow for accessing it with every new project. If you save the type only in the project library it will not be available for future projects

 (*Update*) — if, once a type is applied to an item, the user modifies any of the properties, the type name displayed in the bar will be preceded by the string "*<New> based on ...*". This will also activate the button. Using it will overwrite the type with the properties of the current item and also propagate these changes to all the items included in this type.



Drawing 95. *Type symbol field*

Type symbol — the field is active if a type has been applied to an item and it has not been modified (see: *Update*). This enables adding a short designation to the item, which can be used e.g. for creating sets. in the case of windows and doors the type symbol (designation) may be displayed on the "match"

Levels

and in the case of walls, the ceiling and roof it may be displayed in the item label (flag) located in the section.

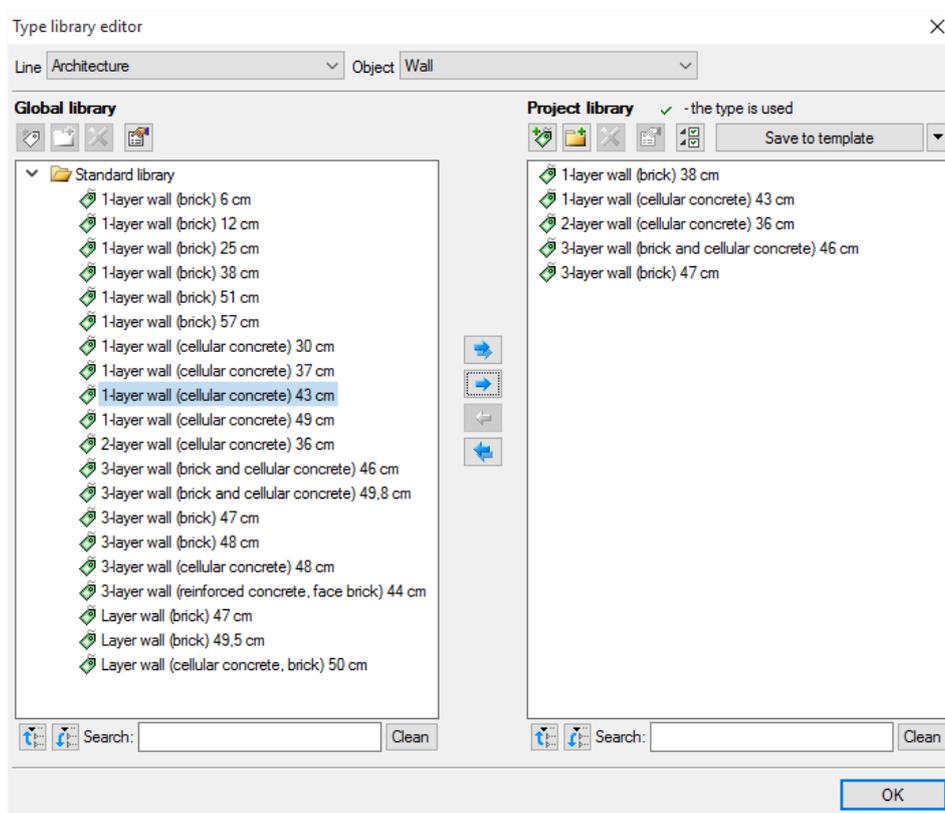
Moreover, by right-clicking the extended type list you can extend the pop-up menu with two options: *Rename* and *Remove type*.

4.6.1. Type Library

Activation:

- *System* ribbon => logical group *Libraries* =>  *Open type library*

Displays the *Type Library* dialogue box.

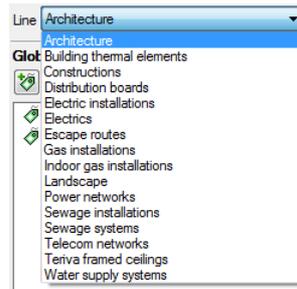


Drawing 96. *Type library window*

The *Type Library* is used to edit and introduce new item types into the ArCADia BIM system. It facilitates access to manufacturer's catalogues and enables selecting only those catalogues that the user uses most often when designing.

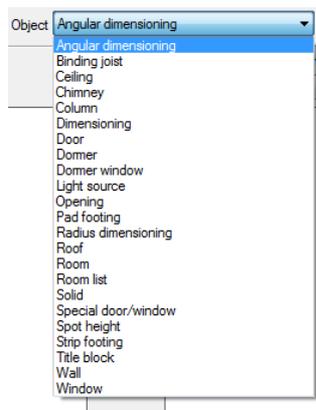
In the upper part of the type editor window the user has the possibility to select a branch from the drop-down list where all the branch-modules available in ArCADia BIM are listed.

Levels



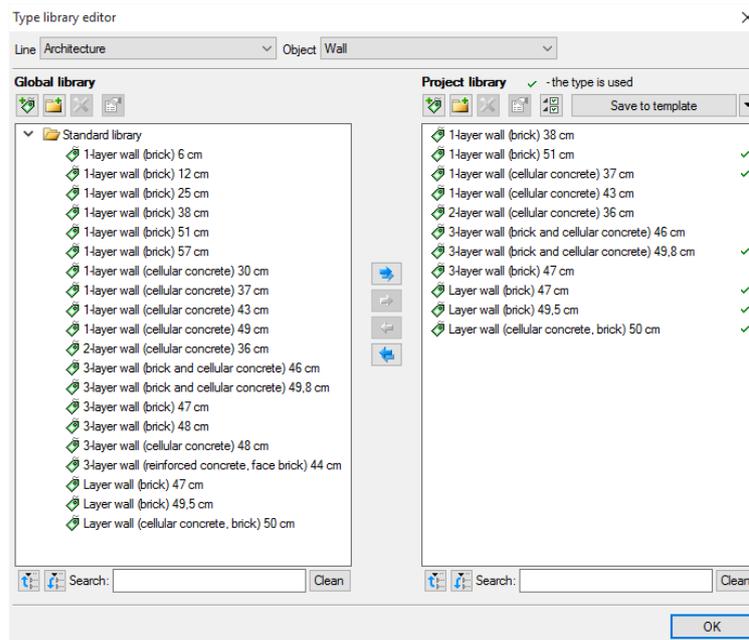
Drawing 97. *Branch List*

After selecting the appropriate branch the user has access to all the items, e.g. *Wall*, available in the selected branch (module) from the *Elements* drop-down list (on the right side).



Drawing 98. *Architecture branch element list*

After clicking on the selected element in the *Global library* all element types will be available. During the first run it will be the types available in the software by default. During the design process you may add additional types into the library.



Levels

Drawing 99. *Type library window*

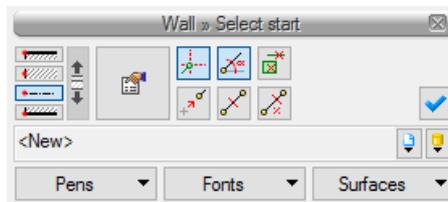
The lower part of the editor is divided into the *Global library* part (left) and *Project library* part (right).

Global library – is a location where all the default element types, available for the user after installing the software, are located (default) – *Standard library* and during the work with the software – *User library*. *Standard library* is not edited (items cannot be added, changed, or removed from it), types available there can be used but modifying and saving the modifications will cause the creation of the new type in the *User library*. All types saved to the global library during the work can be found in the *User library* section. Those types can be modified and deleted.

Project library – is a location where all the saved element types available for use in the project are listed. In other words, element types which were saved during the work (or inserted from a template). List of types changes during the work over a project when the user adds element types.



Drawing 100. *Fragment of the properties window with the Type selection field marked.*



Drawing 101. *The Insert window for a wall, where you can also get access to the project type library.*

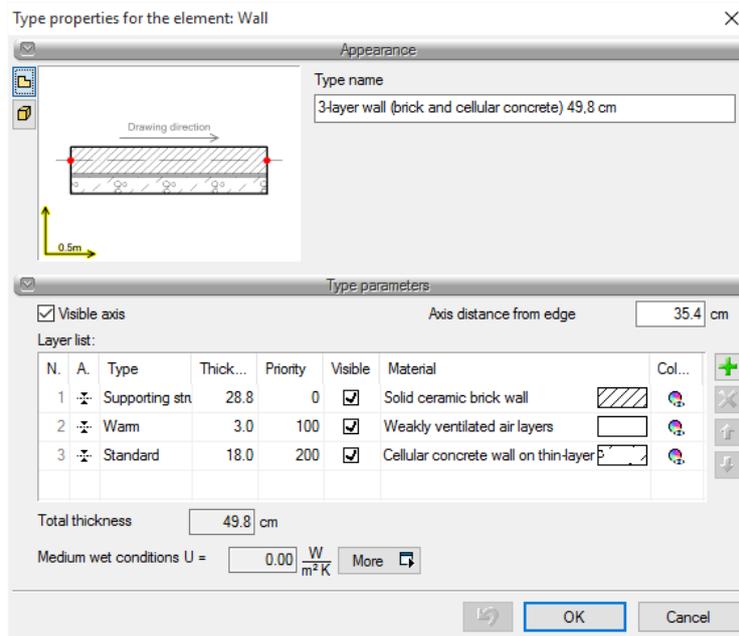
Tab. 6. Tools for adding and editing types.

	<i>Add New Type</i>	Adds new type do Global library (<i>User library</i>) or to the project library. After clicking the icon type properties dialog box is displayed where the user defines name and necessary parameters of the element.
	<i>Add New folder</i>	Displays a window, where the user defines the name for newly created catalogue, where he will be able to add element types. After entering the folder name you need to press the OK button in order to add the folder to the library or Anuluj to cancel the command.
	<i>Delete</i>	Deletes selected type (option unavailable in the <i>Global library</i> in <i>Standard library</i> part).
	<i>Type properties</i>	Opens a window with properties of a selected type. These values can be edited and saved (if the type is

Levels

		located in the <i>Project library</i> or in the <i>User library</i> part in the <i>Global library</i> .
	<i>Leave only the types used in the project.</i>	Deletes unused types from the active document. If there are element types saved in the template where the project is created, then the types will return to the project library list with next launching of the software (even though they are not used)

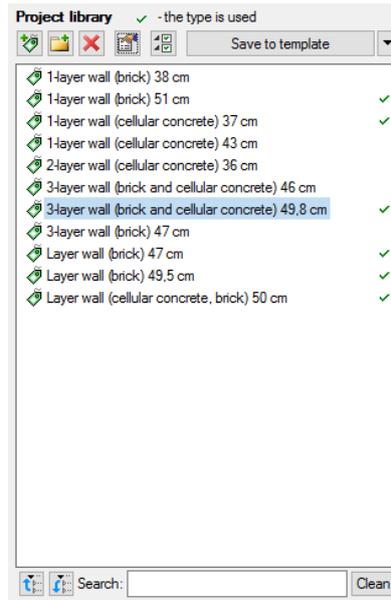
NOTE: Clicking the **Add new type** icon when a type has been previously highlighted in the Library will add a new type based on the highlighted one. This facilitates entering a catalogue of items to the library, e.g. supplied by one company, where the only distinctive feature is e.g. the diameter of the pipe.



Drawing 102. Wall element type window

Above the project library there is the button. Once you click this button the *Project library* settings will be saved in the template and will be accessible for future projects with this template. Next to it there is the icon – when clicked it provides the user with the list of existing available templates.

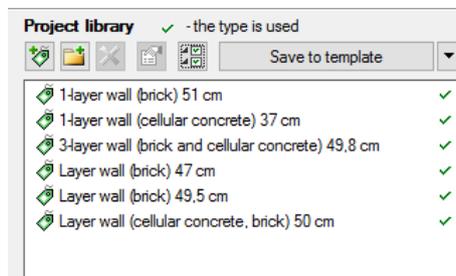
Levels



Drawing 103. List of defined wall types in the sample project.

In the Project library window you can also check what types of a particular element are currently in use in the projection, which is displayed in the form of the ✓ symbol on the left of the name of a particular type.

After pressing the icon  *Leave only the types used in the project* and confirming the question about deleting the types, all unused types will be removed from the project library.



Drawing 104. List of wall types used in the sample project.

Below the two libraries there are the Hide everything  icons – once you click this icon the type tree in a particular library is reduced to the root folders.

The user may also search the library by typing part or the entire name of the desired type in the Search: field. A type list will then be reduced to the types where the name matches the search query. In order to restore the full list and remove the search query you need to push the button, which will clear the search field.

Once you select types or folders, the transfer buttons located between the libraries are activated.

Copy all to the project library  – copies the entire global library content of the selected element to the project library.

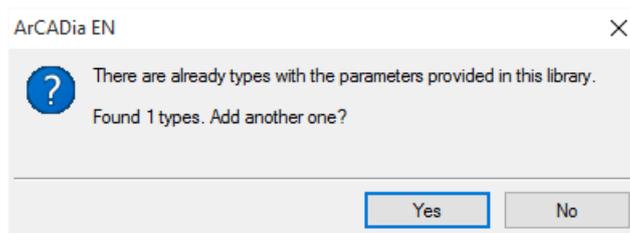
Levels

Copy to the project library  – copies the selected elements to the project library.

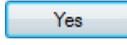
Copy to the global library  – copies the selected elements to the global library.

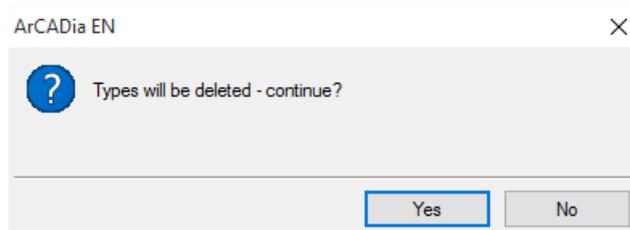
Copy all to the global library  – copies the entire project library content of the selected element to the global library.

Messages that may be displayed when working with the Type Library:

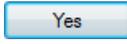


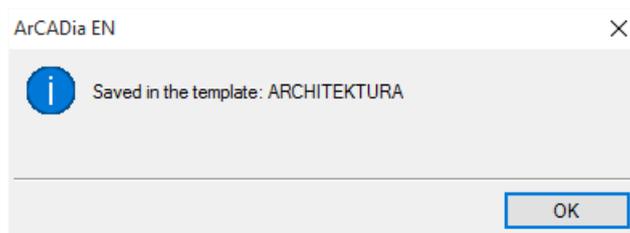
Drawing 105. *Message about finding similar type.*

This message informs that there is already a type with this name. Once you click  the data included in the new type will be saved and will overwrite the data from the previous version of an existing type.



Drawing 106. *Message confirming the deletion of the element types from the library*

This message informs that the types marked by the user were removed. The  button confirms type deletion.



Drawing 107. *This message informs that the layout of the project library was saved to a project template, e.g. ARCHITEKTURA.*

4.6.1.1. Changing element type

This option allows for changing one element type for another in the whole document.

Levels

Activation:

- *System* ribbon => logical group *Libraries* =>  *Change type*

After executing the command you have to select element, which type you want to change. The following window will be then displayed:

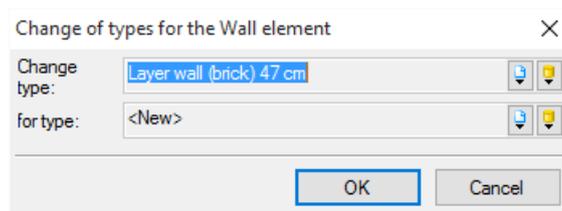


Fig. 6. Type change window for wall element

Change type – type name, read from selected element.

Na type – list of types available in the project  and in the software global library. 

After confirming the selection of a new type message about number of elements that will be changed will be displayed.

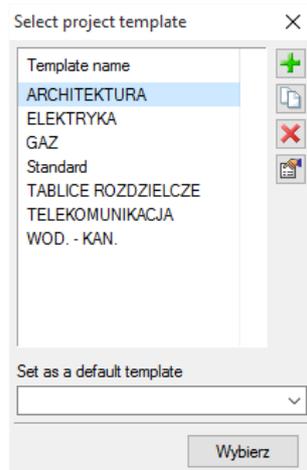
4.7. Templates

A new template feature is provided to save all the element settings, not only their width and height, but also features such as pens, planes and level heights. This feature stores the settings selected by the user and recalls these for the next project. The number of templates is unlimited, it may be linked to the branch, project printing scale, e.g. with the type of the designed building, where the stored heights and level parameters for industrial buildings and single-family development are different and repeated changes consume more time than creating a template file with pre-selected values for all the necessary parameters.

This feature is not the same as the *Element type*, since it saves all other parameters. For example, this feature will save the thickness and colour scheme of pens assigned to a wall (all the walls will from then on be drawn with the pens selected by the user), the selected heights (which is by default the level height), the wall inserted by default that does not need to be a single-layer 25 cm thick wall any more but may be any wall selected by the user (e.g. through the *Type*). The entered parameters will be saved to the active style once you press the *Save to template* button, located at the bottom of each element properties dialogue box.

The template is selected at the beginning of working with a project; after selecting the first feature of ArCADia you will see the following dialogue box:

Levels



Drawing 108. *Template selection window*

Tab. 7. Template management options

	<i>Add template</i>	Adds a new template.
	<i>Create template copy</i>	Copies the template along with all the parameters.
	<i>Delete template</i>	Removes the selected template.
	<i>Template properties</i>	Opens the <i>Template properties</i> window.

Set as a default template – list of available templates, with possibility of selecting default template launched with a project.

In the *Template properties* window you can see what elements are included in the template (e.g. modified parameters for the walls, windows, etc.). You can remove a selected element or change the template name.

NOTE: *When working with the software you can change the template, which will result in all the new elements being drawn with the new parameters. The drawing and its elements created before changing the template will not be modified.*

4.8. Setting drawing units

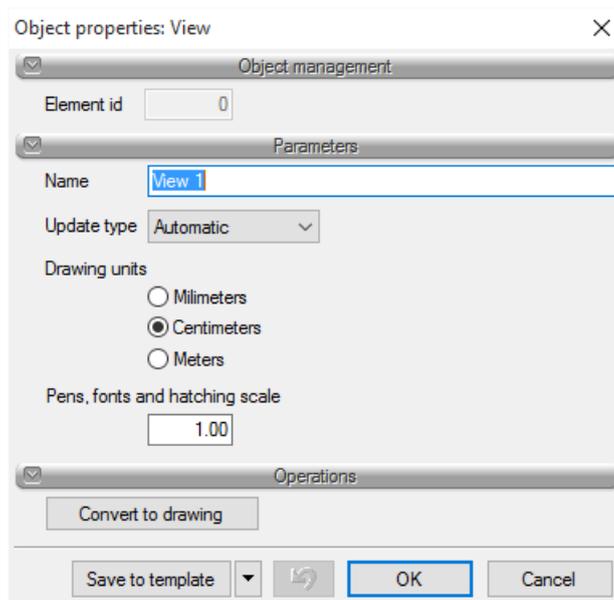
The drawings created with ArCADia BIM are usually drawn in full scale (scale 1:1), and then the scale factor is further determined during printing of the drawing.

The units used to create the drawing can be defined in *View properties* dialogue box.

Levels

Activated from the menu:

Right mouse button click on the view tab in *Project Manager* dialogue box.



Drawing 109. *View properties window*

NOTE: when designing the installations or architecture usually the data are entered in cm, therefore the default units of the view are centimeters. If the project applies to the network which, as an external, urban project drawn

4.9. Layouts

When designing e.g. sanitary installations you often use ready-made patterns that are the same for different projects in the scope of the elements used but may differ e.g. as far as diameters are concerned. It is often the case that manufacturers offer products composed of several different elements, e.g. the mixing system for heater supply, which is composed of pipes, shut-off valves, a three-way valve, actuator, non-return valve pump, manometers and thermometers. In order to ensure seamless design we have added a feature that allows creating such an e.g. mixing system for heater supply and save it to the *Layouts* library. This will enable using a set of elements with the pre-determined parameters as part of any project.

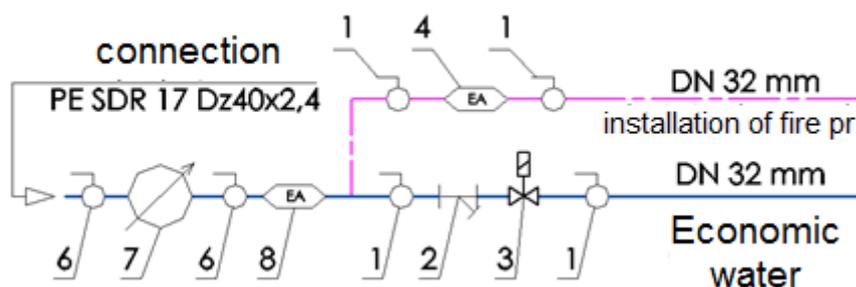
Activation:

- *Object explorer => Layouts tab*

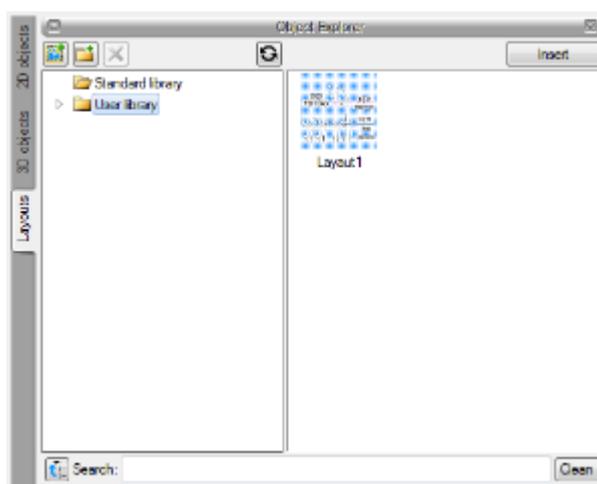
In order to add a new layout of elements that are already drawn you need to do the following:

1. In the Object Explorer => in the Layouts tab select  *Create layout*.
2. Then select the elements that are to be included in the group and confirm your selection by pressing *Enter*.
3. Select base point for the layout.

Levels



Drawing 110. *Drawing elements before saving a layout.*



Drawing 111. *Saved layout.*

In order to introduce the layout to the drawing.

Activation:

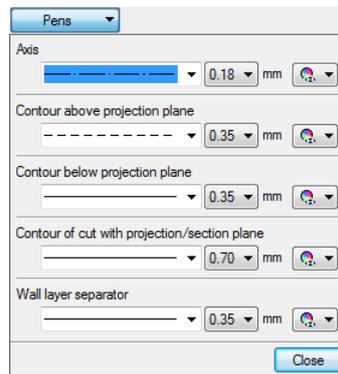
- [Object explorer](#) ⇒ [Layouts](#) tab

1. In the [Object explorer](#) ⇒ in the [Layouts](#) tab select the layout to be inserted.
2. Press the Insert button and indicate the location for the layout in the project.

4.10. Pens

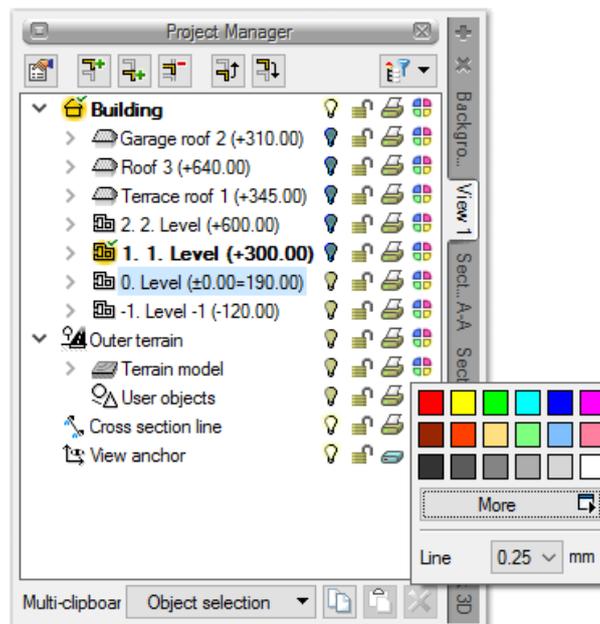
It is possible to assign colour, type and thickness of the line to each element of ArCADia BIM Application, i.e. type of pen. Pens can be assigned globally for the entire level, so that all the elements are entered using the same pen or they can be defined in the properties of object already inserted or being already inserted. And so, for example for the wall you can define pens for the outline line, separating layer, supporting structure axis of wall and outline of trimmed wall, e.g. by the roof.

Levels



Drawing 112. *List of pens for wall element*

Hatching pen thicknesses, i.e. the markings of materials, are available in the *Project Manager* window through the element group colour icon.



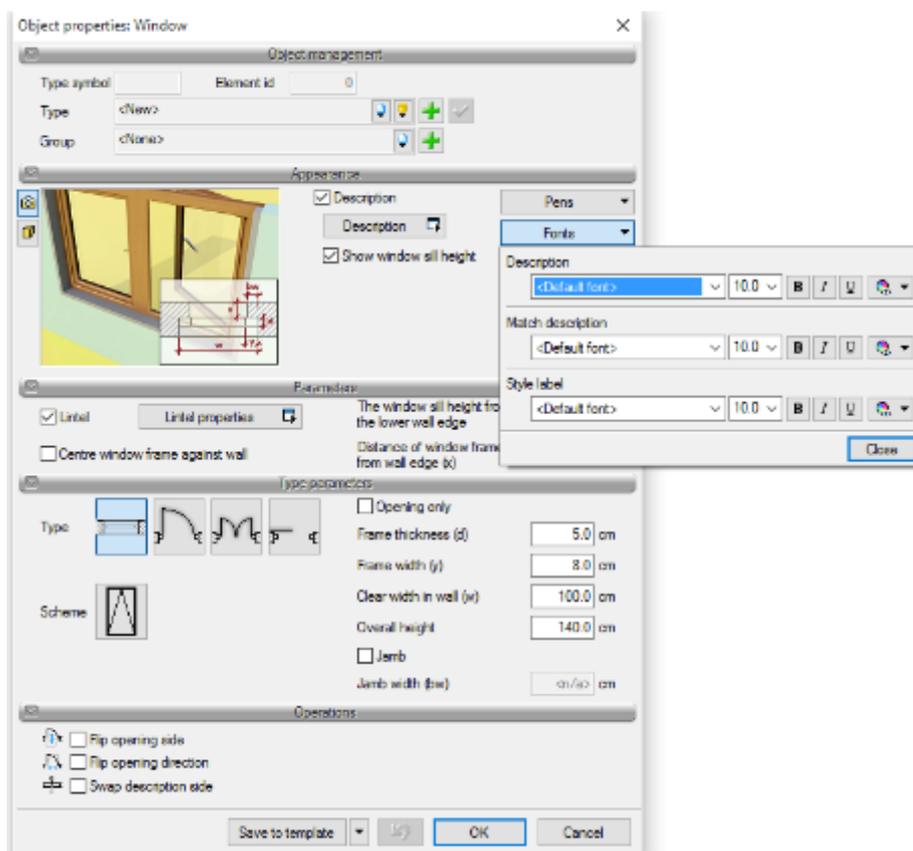
Drawing 113. *Wall hatching pen thickness change*

NOTE Before inserting the element, the markers can always be changed in the inserting window, and for the existing element - in the edition window.

4.11. Fonts

Each element with a description, e.g. window – description bubble provides access to font settings in *Properties* dialogue box.

Levels



Drawing 114. *Window properties dialog box with extended description fonts.*

The default font can be defined in *Options*, and specific descriptions can be defined in relevant *Properties* dialogue box.

NOTE Before inserting the element, the font can also be changed in the inserting window, and for the existing element, you can modify the font in the edition window.

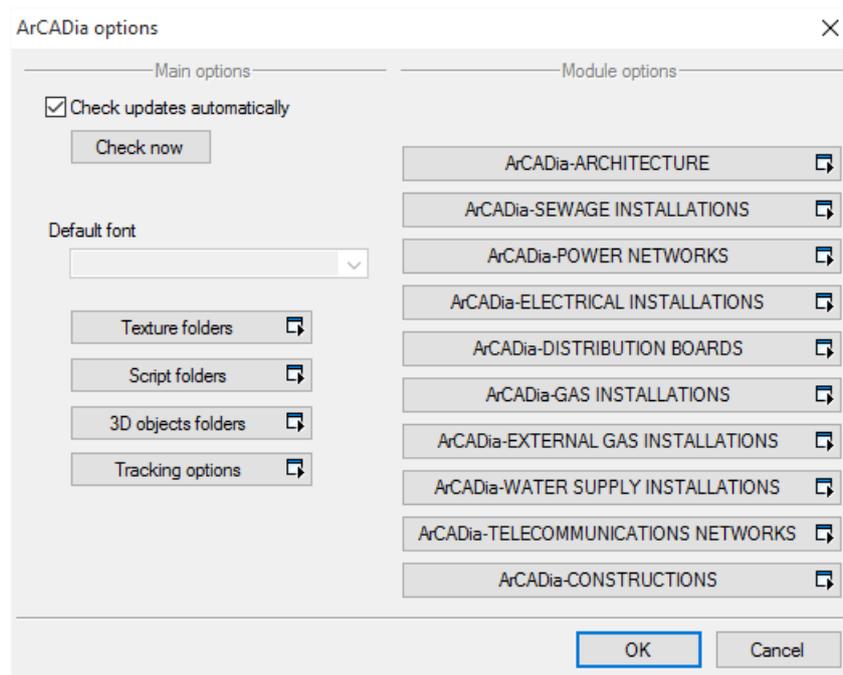
5.OPTIONS

5.1. Options

The ArCADia provides a program settings window for drawings made in all the branch modules or particularly defined, e.g. in ArCADia-ARCHITECTURE. The general settings include font definition, automatic software update check feature and information about the texture and script folders used in the software and Tracking options.

Activation:

- *System* ribbon => logical group *Options* =>  *Options*



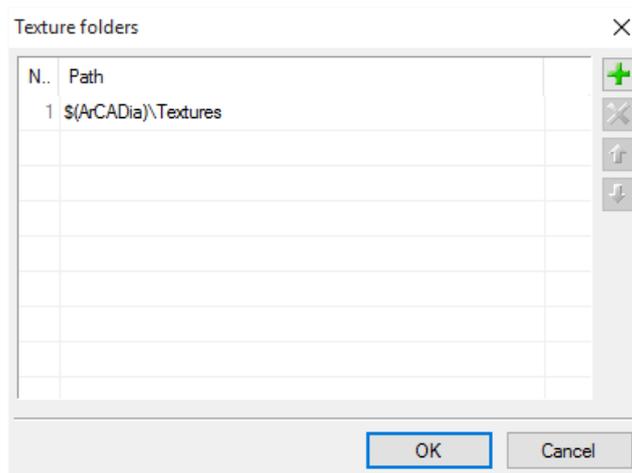
Drawing 115. *ArCADia Options dialog box*

5.1.1.1. Texture, script and 3D object paths

Folders where the software stores window and door scripts, textures and 3D objects may be defined at different locations in the computer. When opening the software and particular projects the software will look for the project elements in these locations stored in the library without textures.

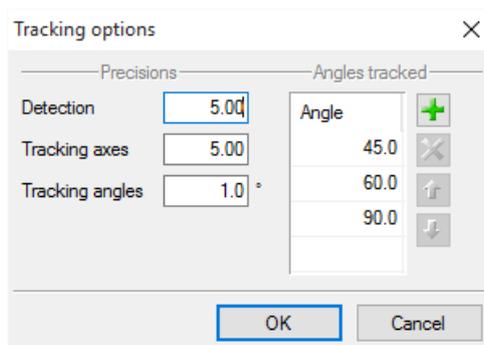
The ArCADia-ARCHITECTURE module offers the possibility of importing .aco objects from ArCon software. These objects are saved with the information on the texture of a given object (i.e. whether the texture is not saved in the object). Therefore, what is important is that before importing the first object or project from ArCon software, you input in the *Texture folders* the path to the *Textures* catalogue in the installed ArCon software. Otherwise, introduced objects will be downloaded and saved to the library without textures.

Options



5.1.1.2. Tracking options

Starting from version 5.6 ArCADia-START contains (for most of the inserted elements) tracking options. It means that after inserting a given element the software will detect the same elements and in some cases, walls, columns, and binders.



Drawing 116. *Tracking Options dialog box*

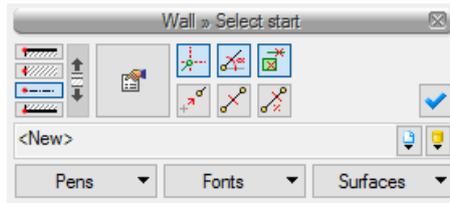
Detection – this option detects edges, axis, corners, and points of the elements inserted to the project, making possible to precisely set the cursor on the drawn objects.

Tracking axes - this option detects points and edges of the inserted elements and sets vertical and horizontal axes from them against the screen or, in case it is e.g. wall edge, displays the extension of such line

Tracking angles – this option selects the angles given in the window above, setting them from previously inserted elements, e.g. from the edges of the drawn walls.

Enabling and disabling the above mentioned tracking options is done during the drawing in the insert element window.

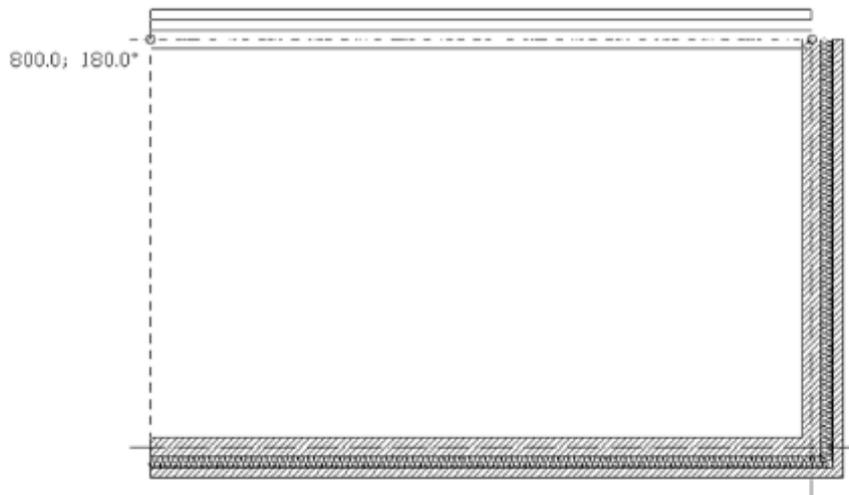
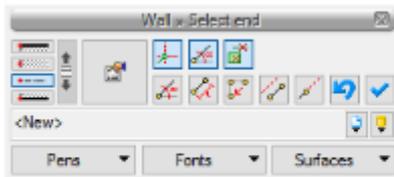
Options



Drawing 117. Example of wall insertion window

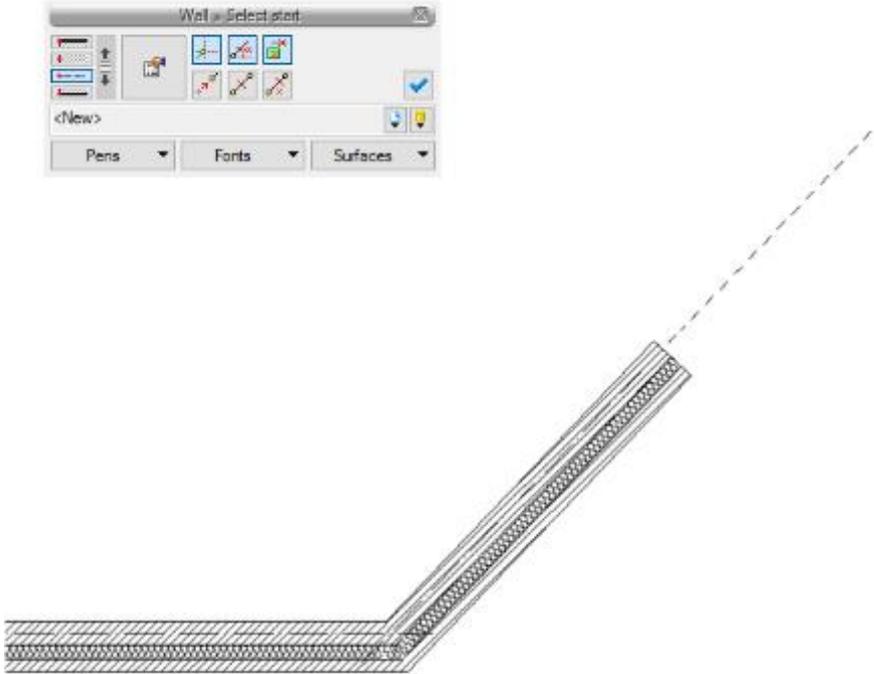
Tab. 8. Tracking functions in the insert window

	<p><i>Tracking axes</i></p>	<p>The option displays horizontal and vertical straight lines directed from the detected points to the inserted elements. If the option will detect an edge of the inserted element it will display a straight line extending the detected edge.</p>
	<p><i>Tracking angles</i></p>	<p>This option displays the selected angles set from the existing elements in the project.</p>
	<p><i>Detecting elements</i></p>	<p>This option detects edges and points of the inserted elements</p>

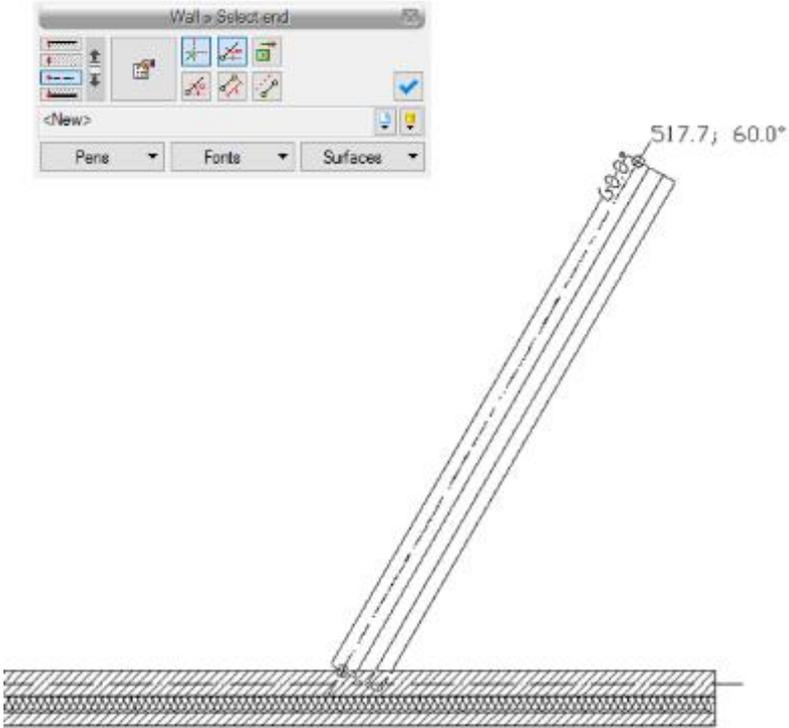


Drawing 118. Example of drawing walls with tracking axes option disabled

Options

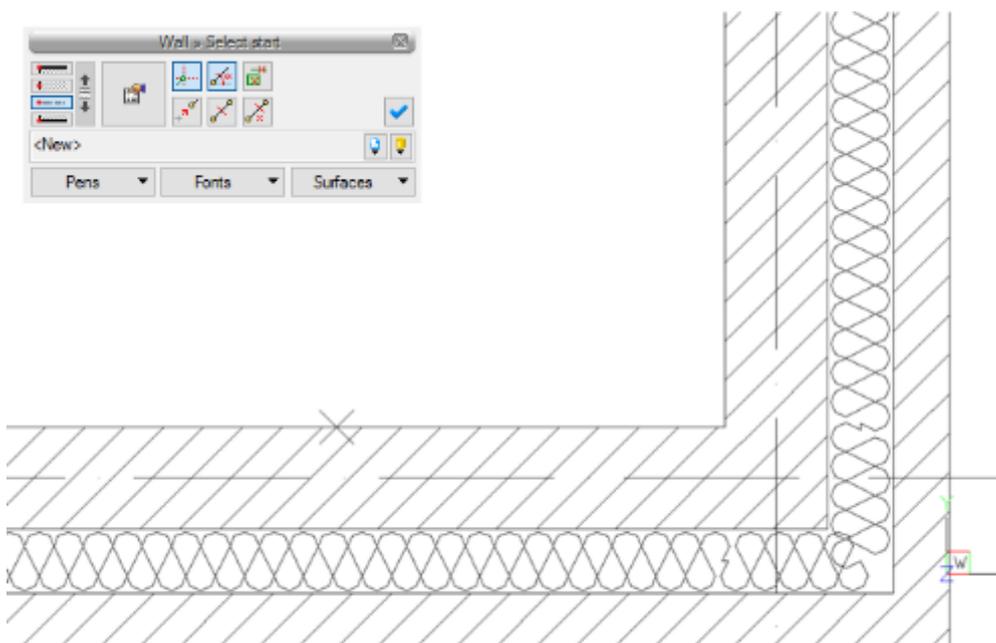


Drawing 119. Example of drawing walls with tracking axes option enabled



Options

Drawing 120. *Example of drawing walls with tracking axes and tracking angles options enabled.*



Drawing 121. *Example of drawing walls with elements detection enabled*

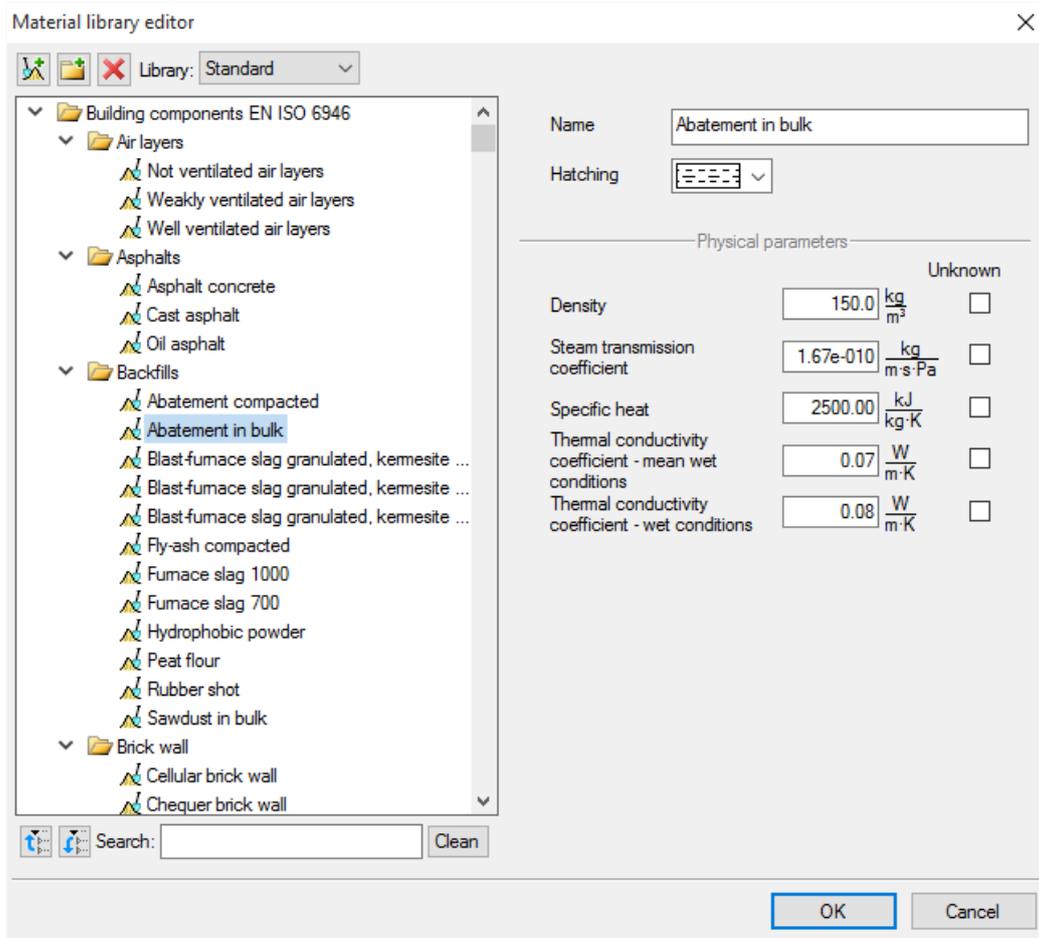
5.2. Material library editor

The material library is an editable item , available in the ArCADia-ARCHITECTURE module.

Activated from the menu:

- *System* ribbon => logic group *Libraries* =>  *Edit material database*

Options



Drawing 122. Material library editor dialogue box

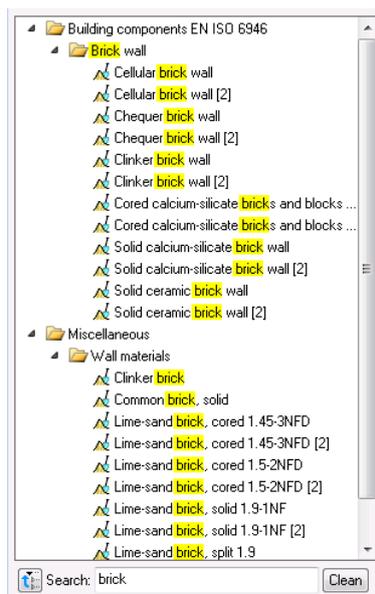
After choosing the material in the above mentioned dialogue box, it can be edited: you can change name, hatching type associated to it and all physical parameters (density, specific heat, etc.).

User may use of the library of materials defined for walls, columns, etc., and for ceiling. Switch between *Basic* library and *ceilings* library in the above dialogue box and choose the one which is to be edited.

The material library may be modified according to the user preferences. Extension of the library is achieved by adding the new folder and material . The material or folder can be deleted by choosing the following icon: .

In order to quickly find the particular material, enter its name in *Search:* box and the Application will display all the materials with the name entered.

Options



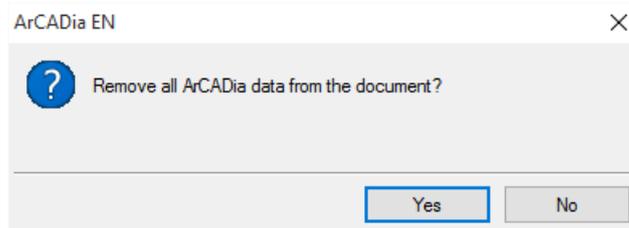
Drawing 123. *Searching for materials by inserting key words*

5.3. Flatten document

When transferring a document to another [CAD](#) software that does not have any of the ArCADia BIM branch modules, you need to divide it before transferring it.

Activation:

- [System](#) ribbon => logical group [Project](#) =>  [Flatten document](#)



Drawing 124. *Question confirming the flattening of the project.*

Once the message is acknowledged, the project will be broken down into elements, which means that there will no longer be a building, levels or their items. From now on the level projection shall be composed of lines and there will be no 3D preview. The project saved in this form will also not allow further editing with ArCADia options, you would not be able e.g. to shorten a wall, since it was broken down and the software no longer has any information about it. This option is really useful for people who do not have the ArCADia-START and only the bare [CAD](#) software.

5.4. Fix document

Should a document become damaged or architectural elements (walls, ceilings, joinery, etc.) cease working properly, you need to scan the project for errors.

Options

Activation:

- *System* ribbon => logical group *Project* =>  *Fix document*

Should the software detect errors, these will be automatically fixed; if no errors are found a message is displayed and the drawing is re-drawn.

6.OBJECTS

Objects

6.1. 2D and 3D Object explorer

In order to enrich the project with 2D symbols or 3D interior design elements, the Application has been equipped with the object library. In the ArCADia-ARCHITECTURE module also custom 2D symbols or 3D objects imported into the Application in 3ds, ACO or o2c format.

6.1.1. 2D objects

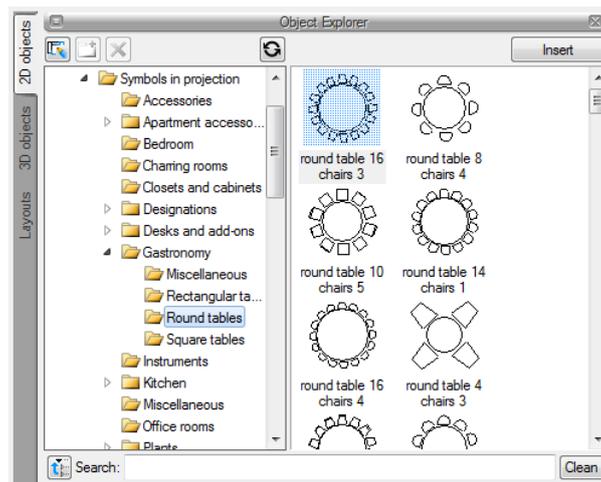
6.1.1.1. Inserting 2D symbols

ArCADia BIM system provides the installed along with the Application library of the equipment objects which may be inserted into the project.

Activated from the menu:

- *Architecture* ribbon => logic group *Supplementary elements* =>  *Show 2D/3D Object explorer*

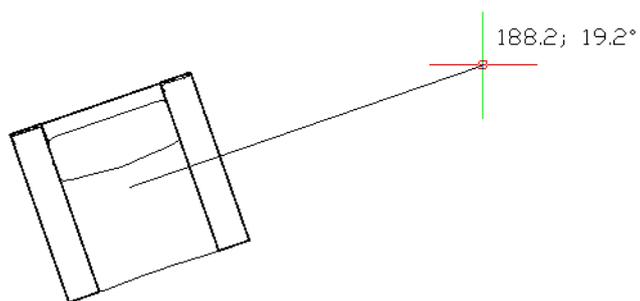
On activation the below object file selection window will be displayed:



Drawing 125. Software library, 2D objects tab

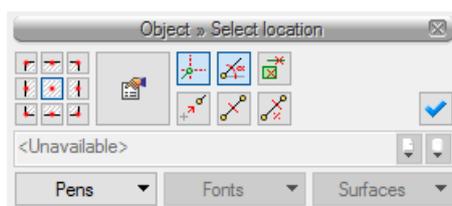
When the object is selected, switch back to the drawing and click on *Insert* to insert the object. Insertion of the object involves pointing of its localization.

Objects



Drawing 126. *3D object insertion*

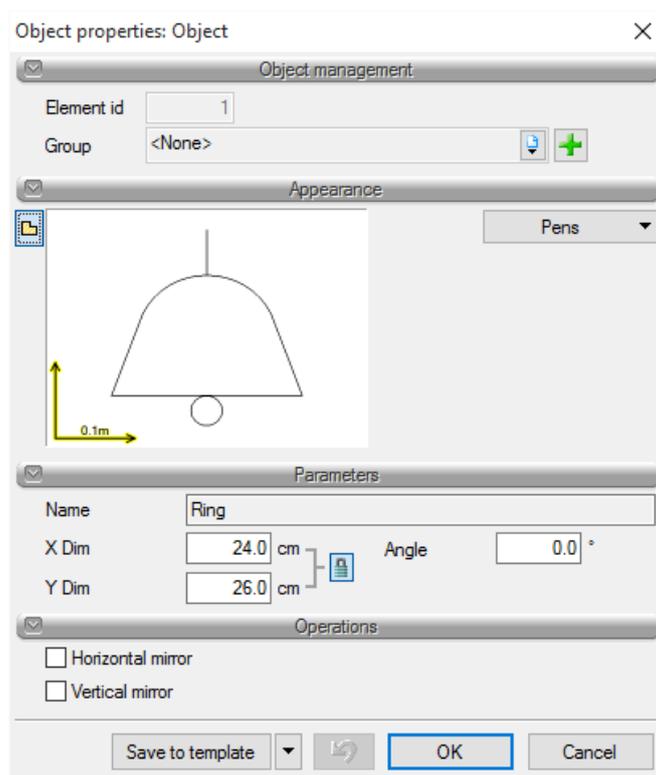
The easier method of location is to choose the insertion point (anchor) from *Object* window:



Drawing 127. *Object insertion window*

Before inserting the object, the *Object properties* window can be activated:

Objects



Drawing 128. 2D objects properties window

The following parameters can be defined in the window:

X Dim — object width in the object coordinate system.

Y Dim — object height in the object coordinate system.

Angle — rotation angle of the inserted object.

Horizontal mirror — object mirroring against Y axis (the option is unavailable during edition of the object inserted into the drawing previously).

Vertical mirror — object mirroring against X axis (the option is unavailable during edition of the object inserted into the drawing previously).

Save in template — saves pen settings, selected style and other parameters of the element to the template.

While drawing, the following functions are available from the insertion window, notification window or command area level:

- *Tracking axes* - this option detects points and edges of the inserted elements and sets vertical and horizontal axes from them against the screen or, in case it is e.g. wall edge, displays the extension of such line

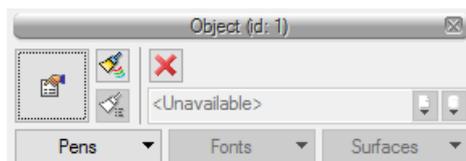
Objects

- *Tracking angles* – this option selects the angles given in the window above, setting them from previously inserted elements, e.g. from the edges of the drawn walls.
- *Detection* – this option detects edges, axis, corners, and points of the elements inserted to the project, making possible to precisely set the cursor on the drawn objects.
- *Reference* – enables to insert an object at a set distance from a selected point;
- *Between points (centre)* – starts drawing of the wall from the middle of the specified distance (distance is entered by selecting two points);
- *Between points (percentage)* – starts drawing of the wall based on the percentage division of the specified distance (distance is entered by selecting two points);
- *Cancel* – terminates a function without inserting an object;
- *Back* – removes the last inserted object;
- *Apply* – completes object insertion;

When the object insertion command is active, plenty of identical objects may be inserted (the command is repeated automatically).

6.1.1.2. 2D symbol editing

2D elements may be modified by copying, moving or deleting. Additionally, the following are available on the edit toolbar:



Drawing 129. 2D object editing window

Tab. 9. 2D object modification tools

	<i>Go to Properties dialog box</i>	Opens <i>Properties</i> dialogue box.
	<i>Font and pen painter</i>	Takes over the type of the floor slab and transfer it to the selected slabs.
	<i>Delete selected object</i>	Removes the selection.
	<i>Pens</i>	Definition of type of the lines with which the inserted element is drawn.

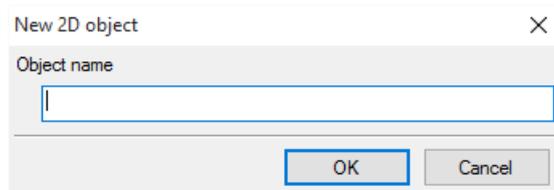
Objects

6.1.1.3. Saving of user-defined 2D objects

In order to extent the symbol library, the option *Create 2D object* is provided, which allows the drawing part (lines, circles and arcs) to be saved as 2D object.

Activated from the menu:

- Window *Object explorer* =>  *Create 2D object*



Drawing 130. *Creating new 2D object window*

On activation of user-defined 2D objects option, specify the new object name and then select the elements which are to be included in the symbol.

NOTE:

*If the new symbol is to be saved in a directory other than the default, run *Create 2D object* function from *Explorer* window, cancel it and then select the desired directory or *Add directory* option. After indicating the desired directory, the option *Create 2D object* must be activated again.*

6.1.2. 3D objects

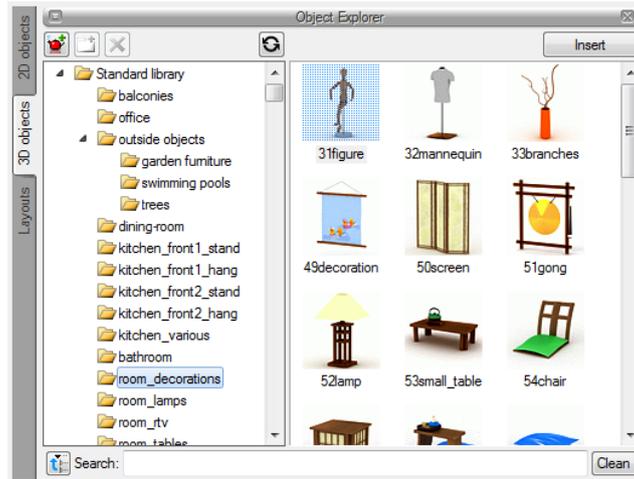
6.1.2.1. Inserting 3D objects

After inserting in the level View 3D objects are shown in the Layout and 3D view. Objects are inserted from the Object explorer activated with the icon  *Show 2D/3D Object explorer* from the toolbar or menu.

Activated from the menu:

- *Architecture* ribbon => logic group *Supplementary elements* =>  *Show 2D/3D Object explorer*

Objects

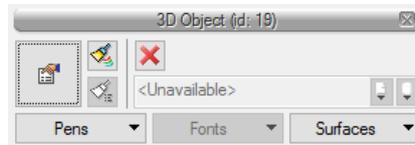


Drawing 131. Software library, 3D Objects tab

The selected element is highlighted by indication and then inserted in the Layout with the *Insert* button.

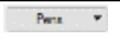
6.1.2.2. Editing 3D objects

3D elements are modified similarly to 2D symbols.



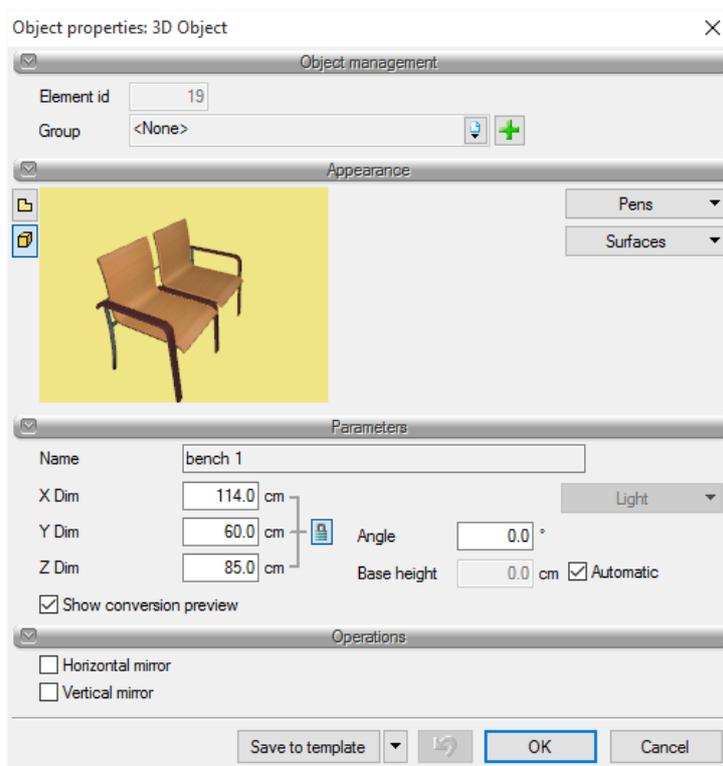
Drawing 132. 3D objects editing window

Tab. 10.3D objects modification tools.

	<i>Go to Properties dialogue box</i>	Opens <i>Properties</i> dialogue box.
	<i>Font and pen painter</i>	Takes over the settings of the pens (thickness and type of the line), as well as the size and type of the font.
	<i>Delete selected object</i>	Removes the selection.
	<i>Pens</i>	Definition of type of the lines with which the inserted element is drawn.
	<i>Surfaces</i>	Assigning materials or textures to specific types of surfaces of inserted element.

Objects

The object size, insertion angle and height at which it is placed can be edited in *Properties* window of the 3D element inserted. The new version of the software lets you rotate objects in axes X and Y, thanks to which e.g., it will be possible to adjust the car insertion angle to the driveway pitch.



Drawing 133. 3D object properties window

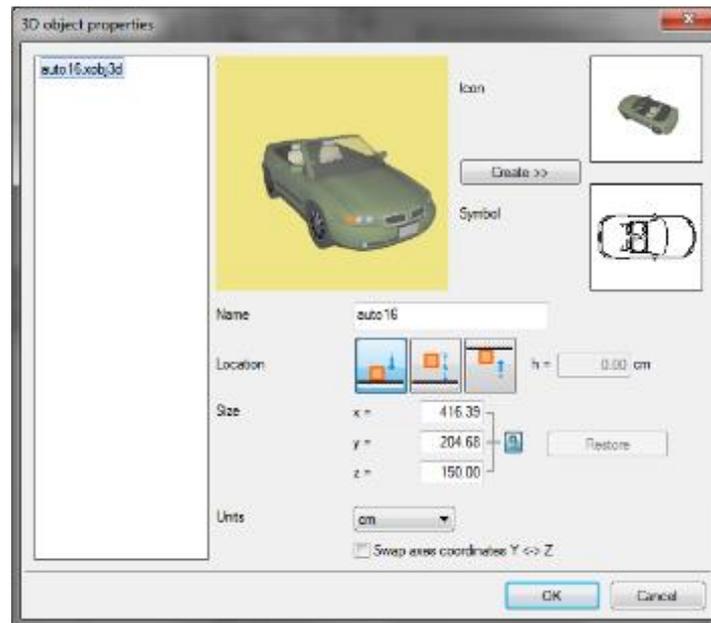
The 3D objects properties window has changed, the options of vertical and horizontal reflections have been removed, as they are available from the level of the drawing (mirror), and two new options have been added:

Generate the symbol on the projection from the 3D solid – creates a new drawing for the 3D object, generating it at closing the window. When rotating elements in axes X and Y, their views are not updated, the symbol on the projection, by default, is not changed. The time of generating a new symbol is dependent on complication of the element and the computer's capacity.

Restore the default symbol on the projection – restores the default drawing of the object regardless of its rotation in axes X and Y.

After saving in the library, the user-defined objects inserted as *3ds*, *o2c* or *aco* files can be additionally modified in the *Object explorer* window through the option *Properties* of the context menu.

Objects



Drawing 134. 3D objects import window

The above window is similar to 3D object import window.

NOTE:

After changing of 3D object name, the appearance of this object used in the previous projects is lost.

Changes of the object size do not influence previous designs.

Objects

6.1.2.4. Saving the 3D objects

CAUTION: Option available only in the ArCADia-ARCHITECTURE module.

The new version of the ArCADia-ARCHITECTURE software offers the possibility of creating the 3D object from the ArCADia system objects. This means that what we will create e.g., using the solid options, can be saved now not only as the *Layout*, which is a set of solids, but as one 3D objects located in the user library and possible to be used in every project. The objects may be saved from all the ArCADia system objects and are subject to the same edition as the 3D objects imported or available by default in the software.

Triggering:

- *Object explorer window* =>  *Export to the xobj3d file*

The option is activated after marking the *Use library* catalogue or other personally added catalogue, in the mentioned folder.

After selecting the option, mark the elements that are to create a new object and approve them by hitting *Enter* or right-clicking.

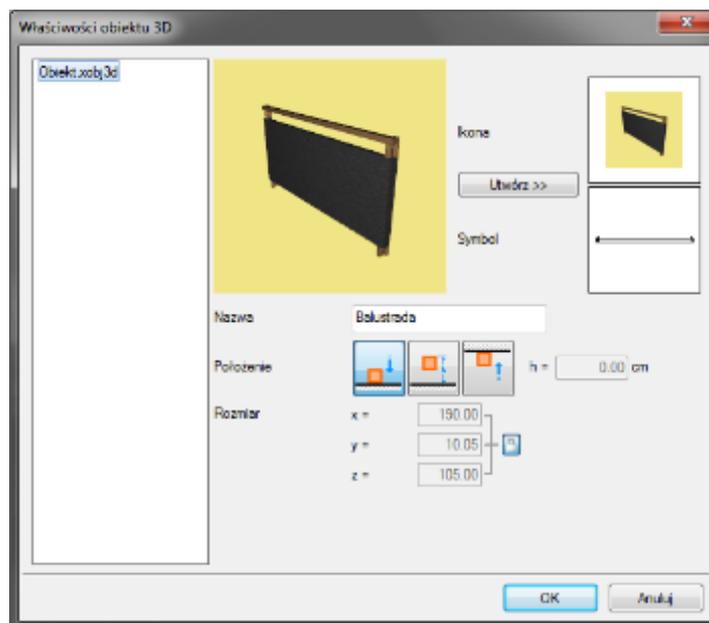


Fig. 7. Window of saving own object

Icon – image showing a new object, displayed in the library.

Symbol – the 2D symbol of a new object visible in the projection.

Create >> - re-activates icon creation (e.g. after rotating the object in the 3D view)

Name – Name of the new element.

Location – default location of the element after inserting, available options: on the floor, at the set height (upper edge of the element is given) or under the ceiling.

Size – information about the size of the created object.

Objects

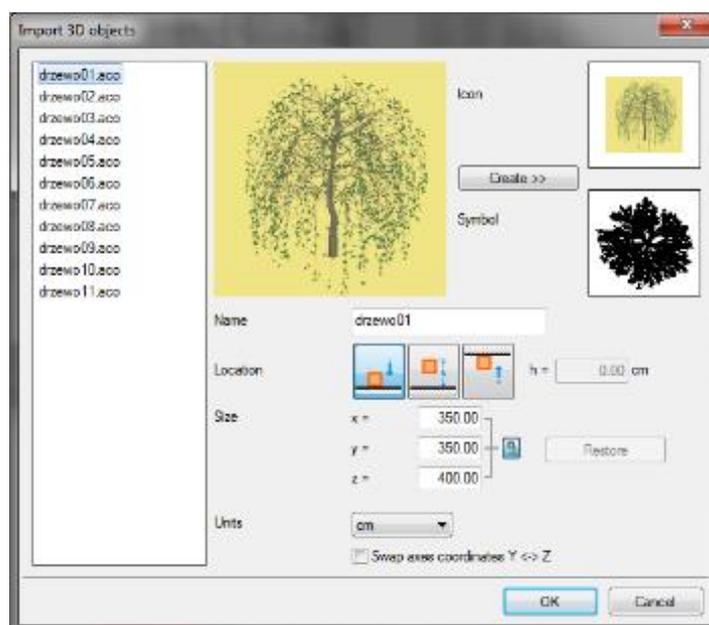
After confirmation of the window, the software saves the object in the library. Since then these will be the same objects as the imported ones, i.e. in the properties window available from the library you can change the size, the default location or the icon.

6.1.2.5. Importing objects

In order to extend the 3D object library, objects with the extension *3ds*, *aco* or *o2c* can be imported.

Activated from the menu:

- *Object explorer* window =>  *Show 2D/3D Object explorer*



Drawing 135. 3D objects import window

Name — name of the object.

Location — determines behaviour of the inserted object: defines whether the object should be located on the floor, snapped to the roof or remain on a given level.

Size — dimensions of the inserted element, by default changed by percentage in each plane.

Units — definition of the unit used during drawing of the element.

Override all — when importing several objects at the same time 2D and 3D views can be counted for all imported elements at the same time.

Icon — 2D image saved as the inserted object preview, and to be stored in the library.

Create >> — the button saving the current setting of the 3D preview and top view of the element being inserted.

Objects

Symbol — object symbol displayed in the Layout (as a simplified element or the actual top View).

3ds, *aco* and *o2c* objects can be imported into the Application with the use of the same function. The type of object to be inserted is selected in the *Select 3D objects* window.

NOTE:

Prior to importing aco objects, one must indicate, in the Options⇒ Texture directories window, the texture paths for the objects being inserted. If the objects are stored in ArCon library, the path must be specified, e.g. c:/Program Files/INTERsoft/ArCon 15/Textures.

If the texture paths are not entered before importing objects, the new elements will be white (they will not have any texture assigned).

6.1.2.6. Saving a design with objects added to the library

If the object library contains user-defined 3D objects and these objects were used in the project which now must be copied to another computer, these objects must be copied along with the project. To this end, after saving the project, you should use the *Create project package* option and along with the file transfer the directory created of the same name as the project .

Activated from the menu:

- *System* ribbon => logic group *Communication* =>  *Create project package*

After moving the project on a different computer the files must be in the same location as the catalogue Then during the launching of the software it will read additional libraries and load the project together with the additional elements.

NOTE *Saved objects are seen only with the originally given project name. If it is changed, the name of the folder with objects should also be modified.*

7.DESIGN TOOLS

Design Tools

7.2. Title block

As of ArCADia BIM system a title block describing the drawings included in the document was introduced. You can introduce a table from the project library or define a new one, introduce it onto a projection or cross-section and save in the library to be used in subsequent drawings.

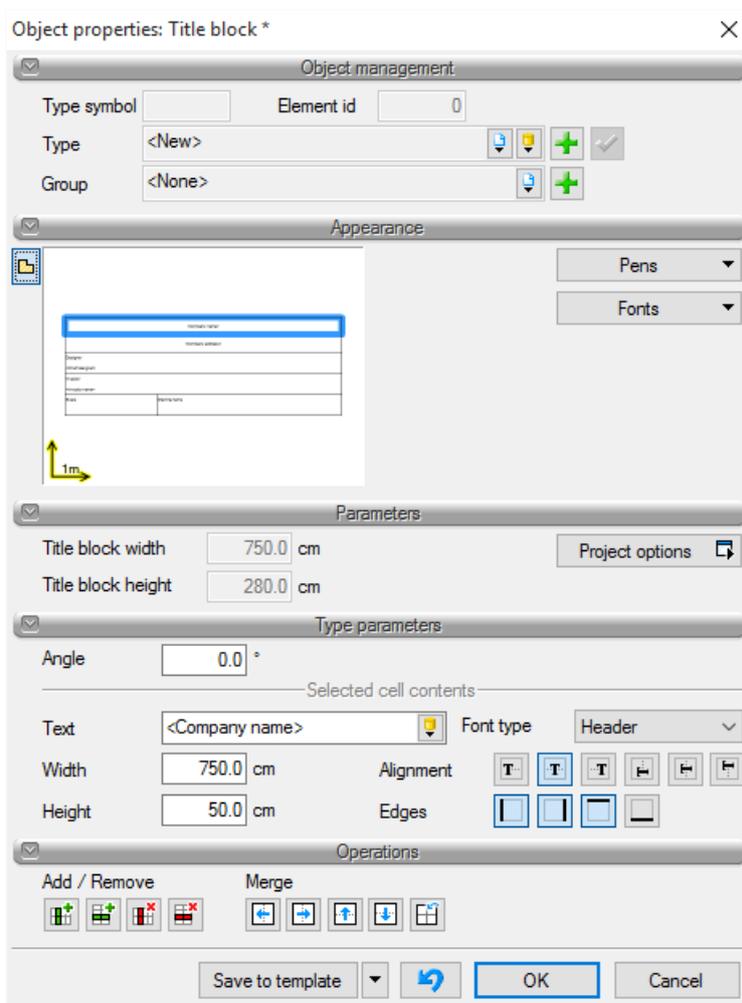
7.2.1. Inserting a table from the library

The feature is available from the toolbar as *Insert title block*.

Activation:

- *System* ribbon => logical group *Insert* =>  *Insert title block*

Once the feature is activated you can introduce a default table, select another from the library or open the *Object properties: Title block*.



Drawing 136. *Title blocks properties window*

Design Tools

Since the *Insert title block* feature assumes inserting a default table, the properties window opens with the default table that you can re-edit. More detailed information is provided in the following chapter.

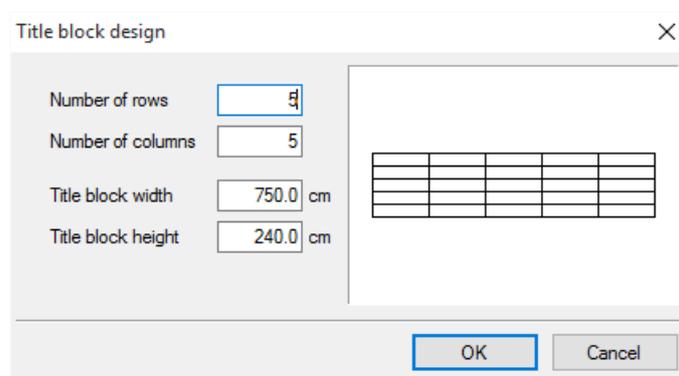
7.2.2. Designing a title block

The feature is available from the toolbar as *Insert title block*.

Activation:

- *System* ribbon => logical group *Insert* =>  *Design title block*

Once the option is activated the *Design title block* window is displayed, where you can define the main contour, its size and number of divisions.



Drawing 137. *Defining table window*

Number of rows — corresponds to the number of horizontal title block cells.

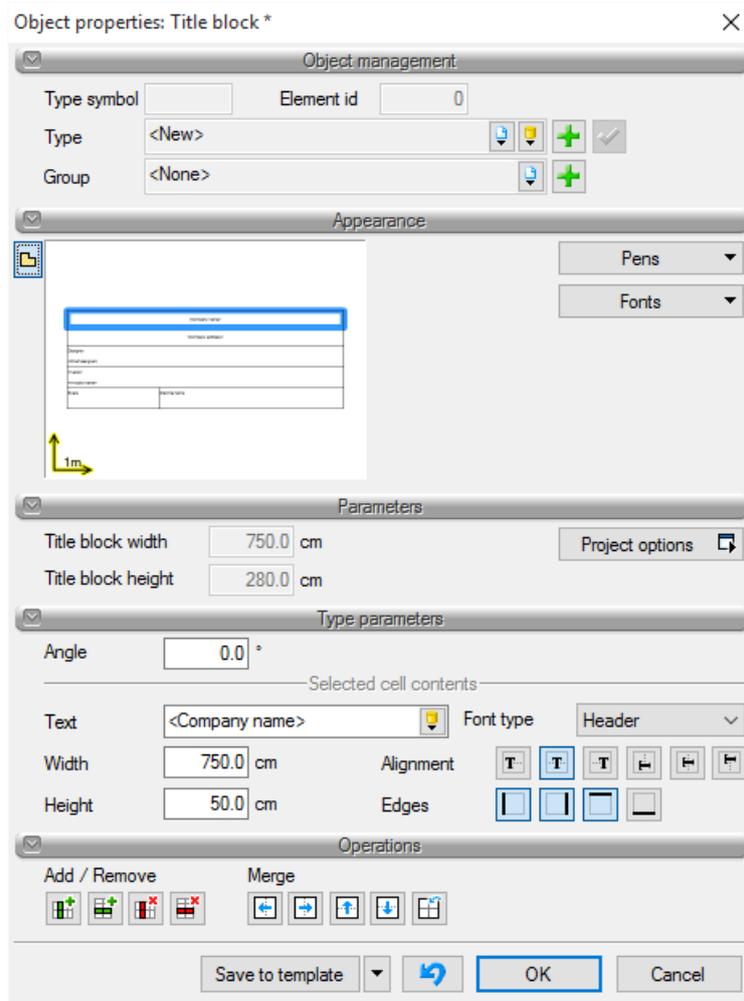
Number of columns — corresponds to the number of vertical title block cells.

Title block width — general width, i.e. the total width of all columns.

Title block height — general height, i.e. the total height of all rows.

Once you click *OK* the *Object properties: Title block window is displayed*.

Design Tools



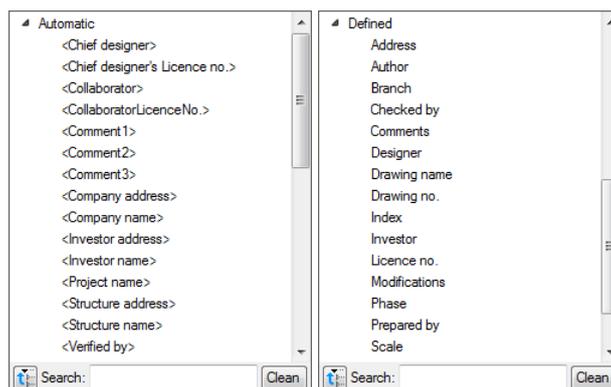
Drawing 138. Created table properties window

Appearance — title block preview that changes along with changing the parameter values. To facilitate moving between the title block it is enough to select a field on the preview, after which the field will receive a blue contour and the Type parameters panel will refer to this particular field. Apart from that, you can also use the **Pens** button, which defines the thickness and line type, as well as the **Fonts** button, which defines the description fonts and its colour.

The following parameters are available for the selected field:

Text — a field where you can input any text or select an **Automatic** or **Defined** text from the software resources.

Design Tools



Drawing 139. List automatic and defined texts for insertion into the table

Automatic texts are data read from the *Project options* window and will be discussed below. *Defined* texts are standard wording included in title blocks for the various supporting structure branches, e.g. *Address*, *Branches*, *Drawing no.*, etc.

Font type — the fields in the title block may be divided into 3 types of fonts, where each can have a different font type and font size. It is enough to select one of the types for the relevant values in each field, e.g. the *Header* for project name, *Content 1* for the descriptive fields like *Date* and *Scale*. A typeface is defined for each type using the *Font* button.

Alignment — text alignment in the field window: left, right or centre.

Edges — for each cell you can disable its contour by selecting the appropriate edge. This will of course be reflected in the adjacent cell, which will appear as a single field in the title block.

Width — cell width.

Height — cell height.

You can set separate parameters for each field. You can move between the cells through the title block preview. Features allowing the merging and repeated division of cells, as well as inserting rows and columns, are available in the Operations panel.

NOTE: *The initial title block size changes along with changes in the cells (field width and height). This needs to be borne in mind when modifying the title block contents. The present value is indicated in the Parameters panel.*

A defined title block is introduced into the projection or cross-section so that you can still use it in subsequent projects (you need to save the Title block type to the global library).

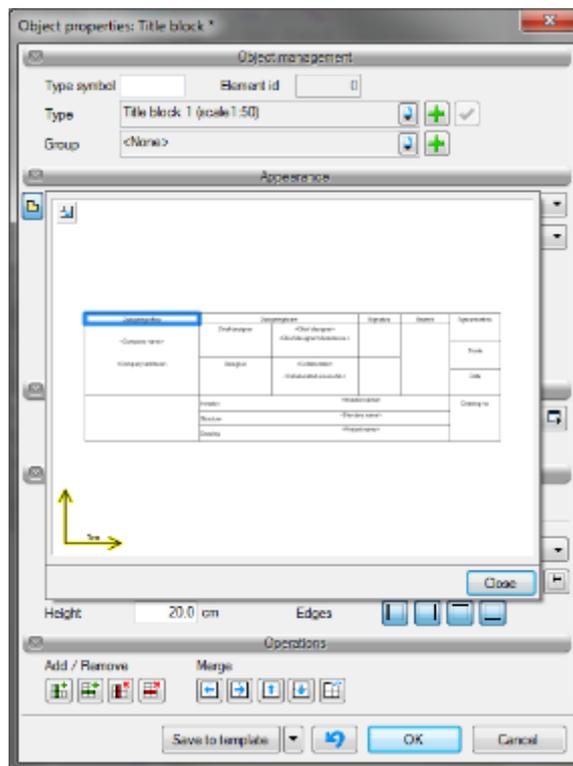
NOTE: *An element type only saves data from the Type parameters panel. This means that e.g. the assigned font faces will be saved and their sizes will not be saved, since this option is outside of the scope of element type.*

Design Tools

Example of a title block definition

We will design an appropriate table with 6 columns and 13 rows. Since a cell can have more than one font type, the Scale 1:50 field will have to be divided into two cells (e.g. with the connecting edge disabled).

Define column width, row height and then you can start merging cells and disable additional edges. If a cell is merged you can input a single row of text with a single font type. If the field is not merged and only an edge is disabled, then in the projection it would seem to be a single cell, but you can input more text or e.g. change the font size.



Drawing 140. Example title block in the view properties

Designing office	Designing team		Signature	Branch	Agreement no.
	Chief designer				Scale
	Designer				Date
	Investor				Drawing no.
	Structure	888			
	Drawing	Project			

Design Tools

Drawing 141. *Table defined above inserted on the projection*

The title block defined above is introduced into the projection.

Part of the information that is repeated may be input in the *Object properties: Document*.

Object properties: Document

Object management

Element id

Parameters

Project name

Company

Name

Address

Structure

Name

Address

Investor

Name

Address

Chief designer Licence no.

Co-author Licence no.

Verifier Licence no.

Remarks 1

Remarks 2

Remarks 3

Save to template

Drawing 142. *Document properties window*

Project name — name of the designed object.

Company — details of the design company.

Investor — investor details.

Once the window is filled, you can enter Automatic text in the table fields that will read data from the window above. For example, if a company name is to be entered into the cell where we're working, then you can select the *<Company Name>* from the *Automatic* texts and if you want to include the company address, you should select *<Company Address>*. Similarly, in order to insert the designer license number, you select the *<Chief Designer License No>*.

Design Tools

7.2.3. Editing title block

Designing and editing the title block are carried out with the same option and take place in the same window. However, the title block can also be edited in the Layout by moving successive line anchors joining the cells. This option is useful when the default title block drawn with lines is available. Then the user defines the number of cells, inserts the title block in the drawing (of existing 2D title block) and moves the row and column edges with the use of anchors. Next, the title block is saved in the global library.

8. COMPATIBILITY WITH OTHER PROGRAMS

Compatibility with other programs

Communication with other software is divided into different modules. In the main module (ArCADia-START) there is *XML export*, i.e. saving of a file in text format. On the *System* ribbon, the Communication group contains:

- *Project presentation and Data for presentation* – options available in the ArCADia-MAKER module (description in the *Project presentation saving* chapter)
- *ArCon import and ArCon export* – options available in the ArCADia-ARCHITECTURE software (description in the *Cooperation with the ArCon software* chapter)
- *IFC Import and IFC Export* - options available in the ArCADia-IFC module (description in the *Cooperation with software supporting the IFC format* chapter)
- *OBJ Export and Initial drawing export to R3D3-3D Frame* – options available in the ArCADia-ARCHITECTURE software (description in the *R3D3 3D Frame* chapter).

8.2. Compatibility with ArCon - Visual architecture

ArCon is a *CAD* program known to most Polish architects. It is dedicated for architects, interior designers, construction engineers, and furniture producers, who get, through the ArCon software, not only wonderful tool for planning but also an instrument of presenting their goods. ArCon is a tool for creating visualizations and preliminary documentation, which can be quickly and professionally completed in the ArCADia software.

NOTE:

Depending on the version of the ArCon software it may be necessary to run both programs as Administrator on Windows Vista, 7, and 8.

8.2.1. Import

All projects created in ArCon can be introduced to ArCADia by using *Import data from ArCon* command.

NOTE:

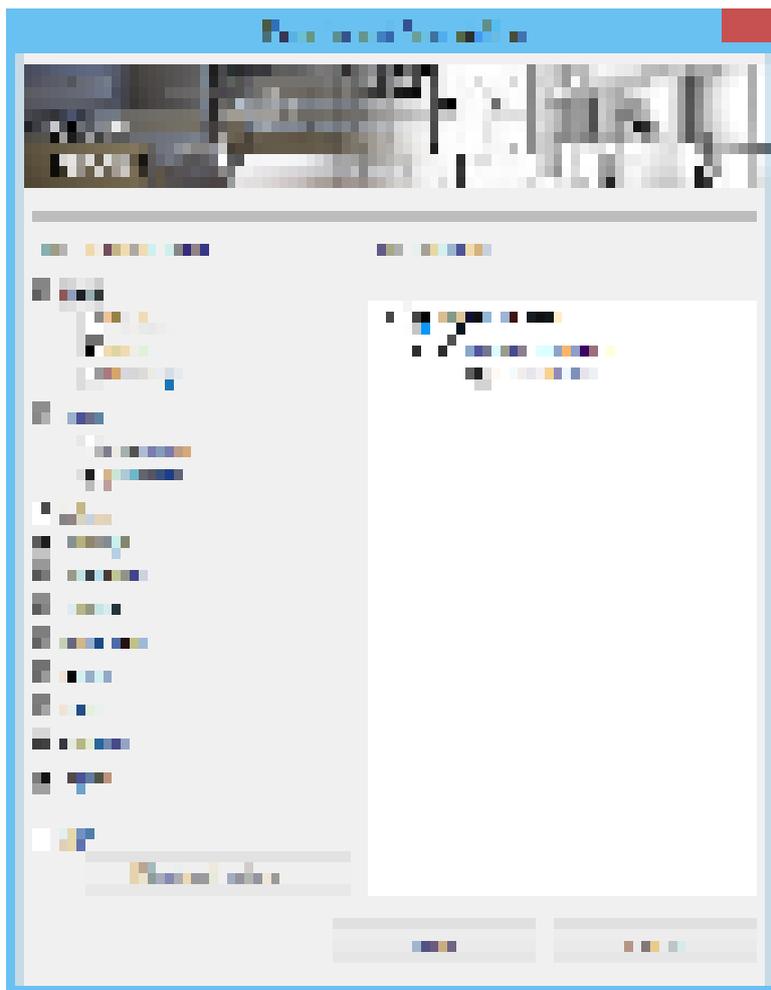
Before importing project you have to select in the Options⇒Texture folders the paths of the textures of the imported objects. If the objects are in the ArCon's library then you have to specify the path, e.g. c:/Program Files/INTERsoft/ArCon/Textures.

If the paths to the textures are not given before the import of the projects then all 3D objects captured from the ArCon will be white (they will not have any texture).

Activation:

- *System* ribbon => logical group *Communication* =>  *Import data from ArCon software*

Compatibility with other programs



Drawing 143. *Importing data from ArCon software window*

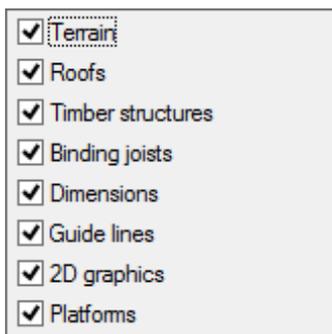
NOTE:

It is required that ArCon and ArCADia-ARCHITECTURE are both running at the same time.

From version 6.0 of ArCADia-ARCHITECTURE the objects captured from the ArCon software as 3D Objects are automatically added to the library. Therefore it is very important to define proper texture paths of the ArCon program before the first import. See information above.

After activating the command the software transmits whole projects as solid. If you are using ArCon program in version higher then 9, then aside from wall, window, doors, ceiling, roof, etc. elements (listed in the tree in the import window) also additional 2D elements are captured (through the [MBA](#) file) which are not present in the ArCADia software e.g. roof framing drawing. Those elements are shown in the [MBA import options list](#).

Compatibility with other programs



Drawing 144. List of elements imported as a 2D drawing.

NOTE Drawings created as mba import are available at import only on ArCADia-INTELLICAD 6 and ArCADia-START software.

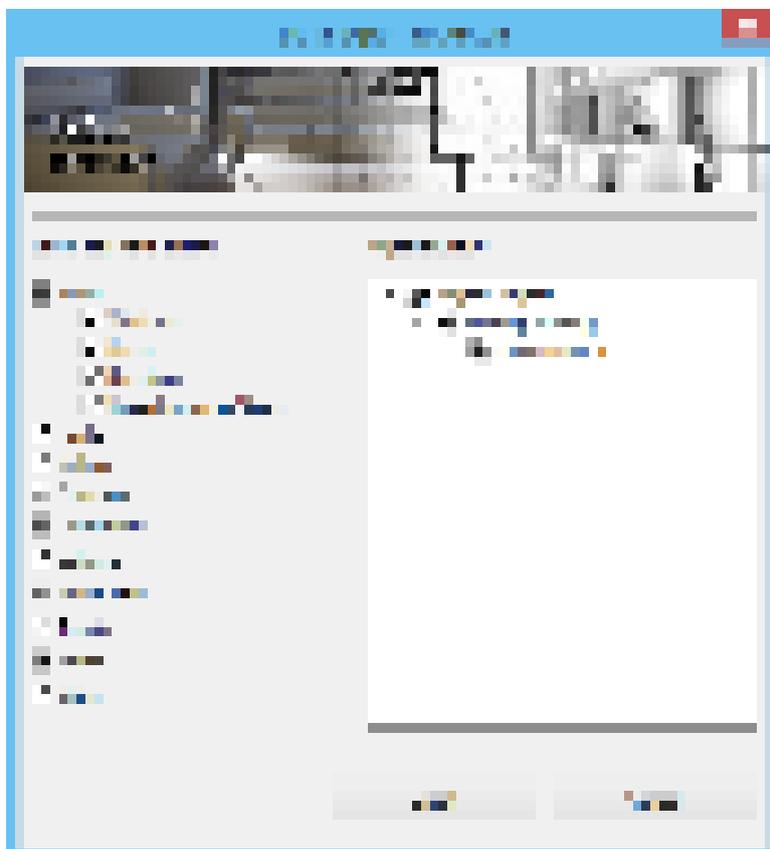
Cross-sections created in the ArCon software will be captured as cut line of the building and inserted once again in ArCADia-ARCHITECTURE software.

Structural elements from ArCon software such as: walls, windows, doors, chimneys, and columns are automatically captured as ArCADia elements and can be given appropriate properties such as layers for walls, or diagram for woodwork.

NOTE:

In case of very complex roofs or roofs which were in modified in ArCon using macro there may occur a situation where such roof will not be captured. Then it is necessary to attempt to import again, selecting the Geometric ⇒ roofs option in the import window.

8.2.2. Export



Compatibility with other programs

Drawing 145. *ArCon software data export window*

Modifications in elements transferred as ArCADia objects may be taken over into ArCona. To do that, use the command *Export* data to ArCon.

Activation:

- *System* ribbon => logical group *Communication* =>  *Export data into ArCon software*

The export button transfers the entire project in to the ArCon software.

NOTE: *When exporting a project to the ArCon software, the program should be started with no active document.*

8.3. Support for other IFC-capable programs

This feature is to enable working with projects created in other software (ArchiCAD, Revit, Allplan), re-creating the objects of the above-mentioned programs with ArCADia objects. This means that projections defined in other programs will not be composed of lines representing walls, windows, doors, but will be those objects. They will ensure full functionality and editing possibilities. This means that the imported wall will be a wall subject to edition, and will include windows and doors, and the next ones, if necessary, can be added. If some element is not in the ArCADia system, and it is in a different program which has saved such a file, it will be replaced with a 3D object, for information on where it was and how it looked like.

The ArCADia system allows to export the whole project for the "equipped building" with all elements from architecture, networks and systems. The building model is imported (elements forming the architectonic model of the building) and other elements seen later by the ArCADia software as 3D objects. These objects must, however, fulfil the following conditions:

1. They must have a shape representation i.e. *IfcShapeRepresentation*.
2. This representation must have the set *RepresentationIdentifier* to the value of *Body* or *Explicit Shape*.
3. This representation must have at least one *IfcRepresentationItem* of *IfcFacetedBrep* or *IfcFaceBasedSurfaceModel* type.

After loading to the project of the ArCADia system in the properties, these objects may have a table with information about the name, the value and unit, provided that they have *IfcPropertySet* assigned.

NOTE *The ArCADia system processes the imported objects into logical system elements, if when defining the project in a different program, they are not introduced in accordance with the principles of creating the building body in the system, these elements will not be loaded. An example will be ceilings for all storeys introduced only on one floor.*

8.3.1. Import

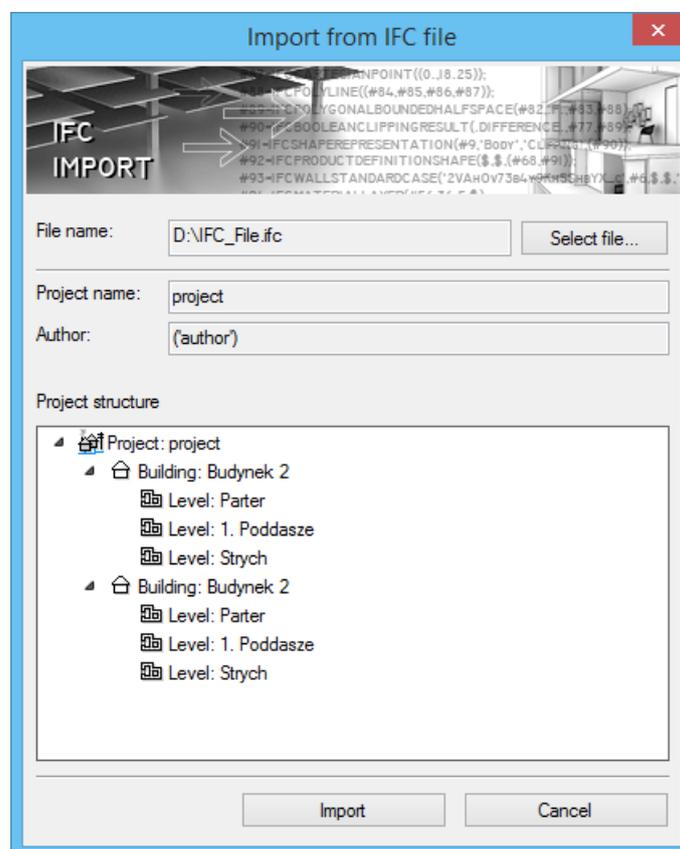
Projects saved in the *IFC* format are introduced using the *Import data from IFC* format command.

Compatibility with other programs

Activation:

- *System* ribbon => logical group *Communication* =>  *Import data from IFC format*

After the command is used, a Data import dialog box appears on the screen, where the project file is selected:



Drawing 146. *IFC file import window*

This window contains information about the contents of the selected project. After selecting the import option, the building will be loaded into the software.

NOTE *Imported walls and ceilings will have, in the properties window, the data about defined layers, material type, but due to the fact that the software libraries differ, material hatching will not be shown. You should either define new materials for these bulkheads consistent with the software library or introduce new materials to the software library.*

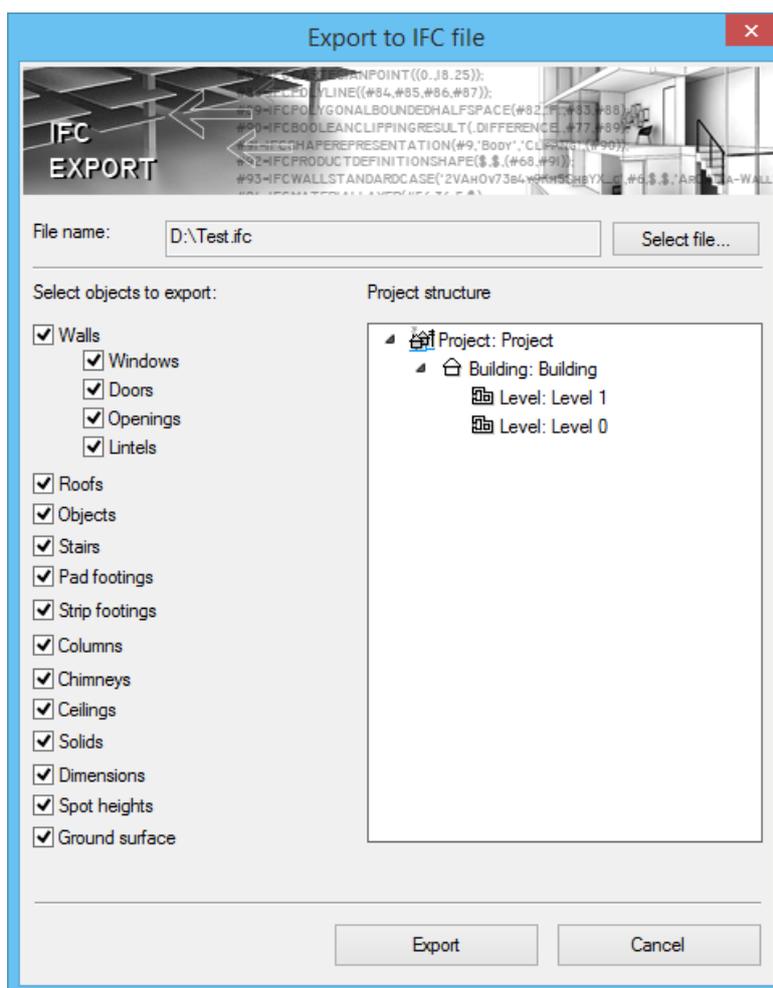
8.3.2. Export

Exporting *IFC* data is possible by selecting the Export data to *IFC* format command.

Activation:

- *System* ribbon => logical group *Communication* =>  *Export data to IFC format*

After this option is selected a project save and data export window is displayed:



Drawing 147. IFC file data export window

The window above will allow for the selection of elements to be exported by selecting subsequent items in a list. By default the entire project is exported, together with all the ArCADia software elements. After selecting the export option, use the *Export* button.

8.1. R3D3 3D Frame

The new version of the ArCADia-ARCHITECTURE software offers a possibility of a broader communication with the R3D3-3D Frame software from version 15 than only by creating a roof truss. From R3D3-3D Frame software there is a possibility to import the bar structure and you can export to it all roofs of the project at the same time, along with the initial drawings of modular axis grids.

8.1.1. F3D file import

The option imports framework of the structure created in R3D3-3D Rama software that, after loading, will be one object, but it can be split into single elements that can be edited. The framework is, by default, one object, but if in the project there are more than one storey, it will be divided into these storeys.

Triggering:

Architecture ribbon => logic group *Building* =>  Import F3D

Compatibility with other programs

After triggering the option, the window is opened in which you should indicate the file. Then you can introduce the framework, or even before inserting, enter the window: *Element properties: Structure of bar frameworks*:

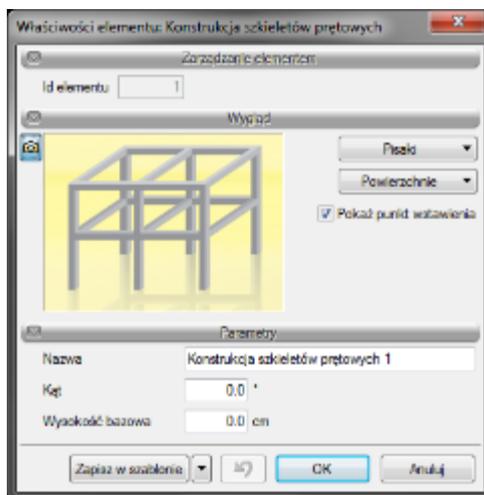


Fig. 8. Properties window for the introduced framework

Appearance – panel enabling definition of the type, colour and thickness of markers for the introduced element on the projection, in the 3D view, areas whose materials is set also in this panel will be shown. Additionally, by default, the Show inserting point option is marked and, when necessary, it can be disabled.

Name – name for the combined framework.

Angle – rotation angle of the structure inserted on the projection.

Base height – the height of location of the input structure.

Save in the template – saves to the template the settings of the markers, the selected style and other parameters of the element.

Pressing the **OK** button lets you go back to the drawing and introduce the pole. Introduction of an element is done by indicating its location. During drawing, from the level of the inserting window, the notification window or the command area, the following functions are available

- **Reference** – enables inserting the bar framework in the set distance from the selected point.
- **Between points (centre)** – starts drawing the element in the centre of the indicated distance (the distance is given by indicating two points).
- **Between points (as a percentage)** – starts drawing the element in the preset percentage division of the indicated distance (the distance is given by indicating two points).
- **Cancel** – aborts the function without the inserted element.

Compatibility with other programs

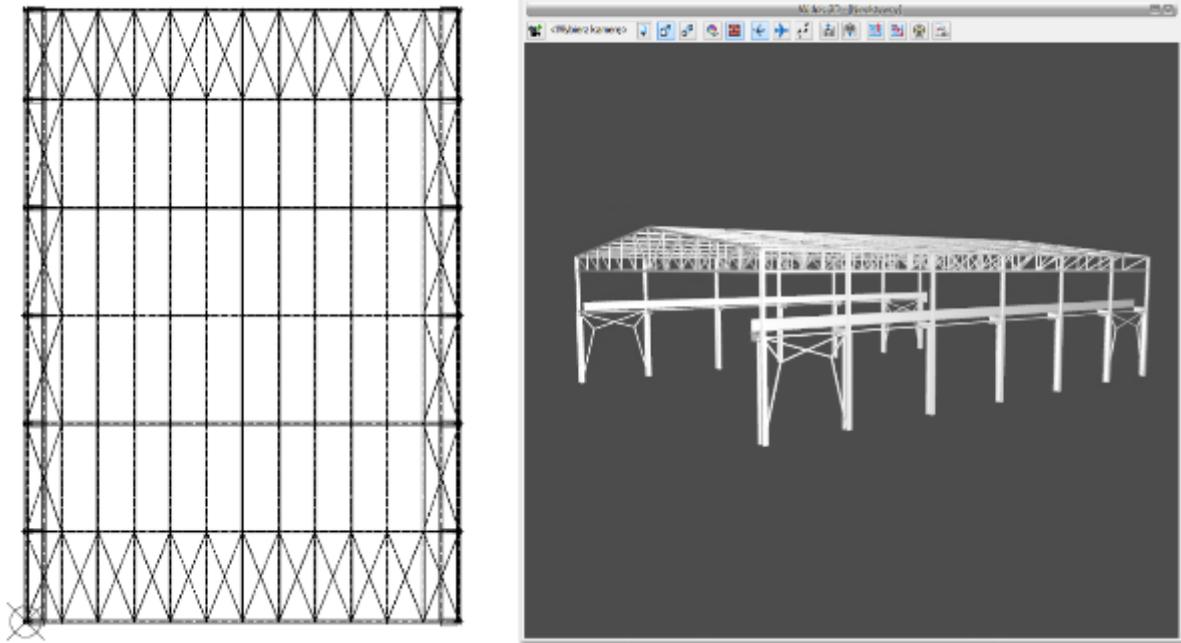


Fig. 9. Example of the framework structure imported to the software

8.1.1.1. Bar structure properties

After introducing, the structure is seen as one object which, in the properties window, has the same options as the before inserting. The framework can, however, be split, then each element will be subject to separate edition.

Compatibility with other programs

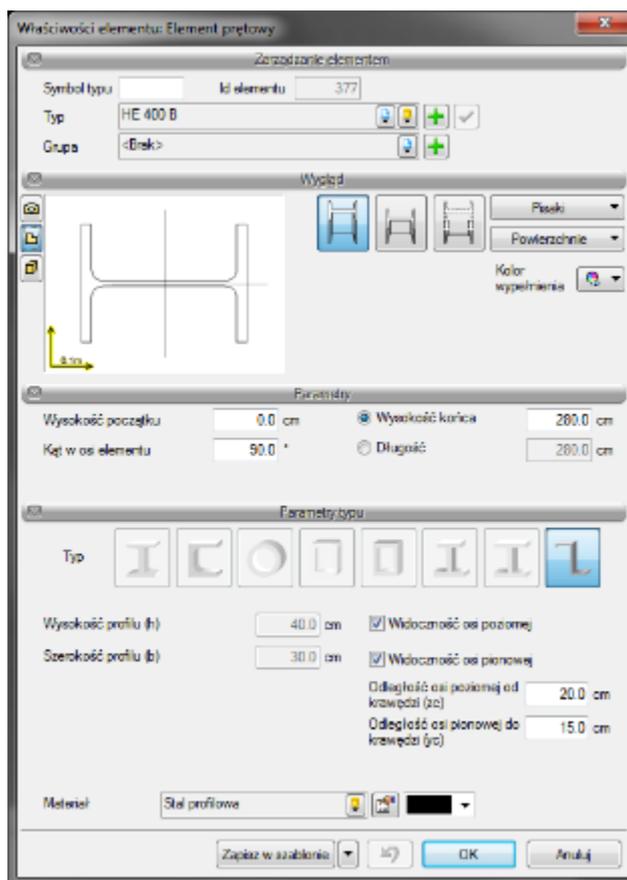


Fig. 10. Window of one of elements of the split framework of the imported bar structure.

8.1.1.2. Bar structure edition

After selecting the bar structure (not split) it can be moved, copied, removed and you can change its properties. Some of these options are available only from the edition window level:



Fig. 11. Edition window of the bar structure framework

Tab. 11. Structure modification tools

	<i>Properties</i>	It opens the <i>Properties</i> window.
	<i>Font and marker painter</i>	It takes over the marker settings (thickness and types of lines), as well as the size and the type of the font.
	<i>Split the bar framework</i>	Divides the imported structure into different part which from now on will be separate elements.
	<i>Show element properties in the bar framework</i>	Shows the properties window of the indicated structure element, without the need to split it.
	<i>Delete selected elements</i>	Deletes the marked structure.

Compatibility with other programs

Pisaki ▾	<i>Markers</i>	Definition of the type the line used for drawing the introduced element.
Powierzchnie ▾	<i>Surfaces</i>	Assignment of materials or textures for particular surfaces of t introduced element.

8.1.2. Initial drawing export to R3D3

To the R3D3-3D Frame software from version 15 you can export the initial drawing of the structure from the ArCADia-ARCHITECTURE module. It moves the information about all modular axis grids and the geometry of introduced roofs. Modular grids are joined into one and projected at the base height of the building. In crossings of axes, vertical auxiliary elements are introduced, for easy introduction of structure elements in the R3D3-3D Frame software. If, in the initial grid drawing, there is a roof, the modular axis grid will be copied on it, also for easy introduction of structures. The initial drawing goes to the R3D3-3D Frame software without modification, i.e. not as in the case of transferring the roof truss, where, along with the roof geometry, the automatic roof truss is created automatically. Here, only initial drawings pass, and the structure is introduced by the user.

Triggering:

- *System* ribbon => logical group *Communication* =>  *Trace export to R3D3-Rama 3D*

Initial drawing export does not save file, opens the R3D3-3D Frame software and moves axes and roofs.

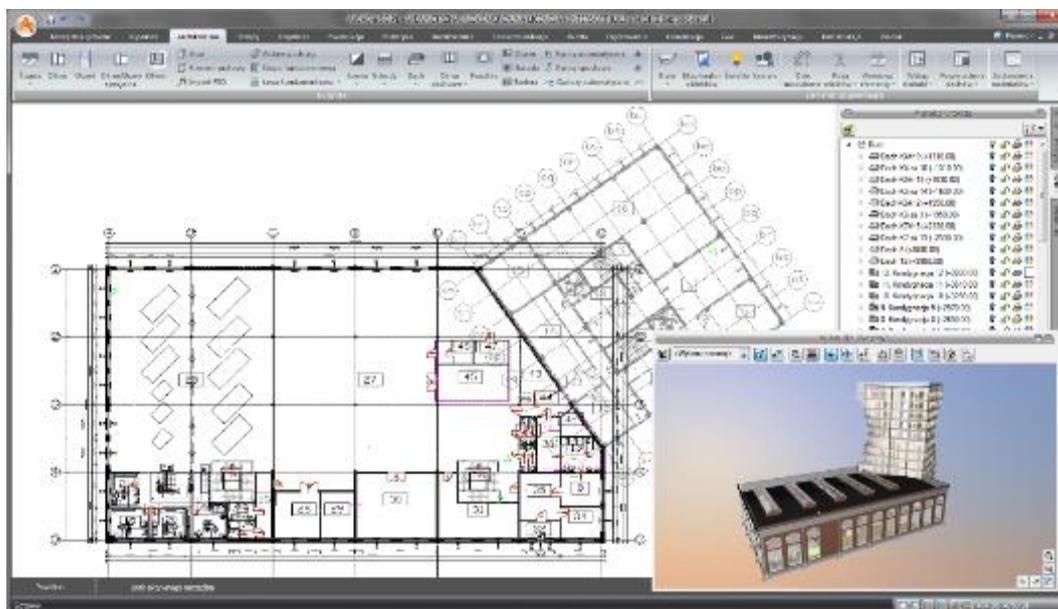


Fig. 12. Sample project exported to R3D3-3D Frame software

Compatibility with other programs

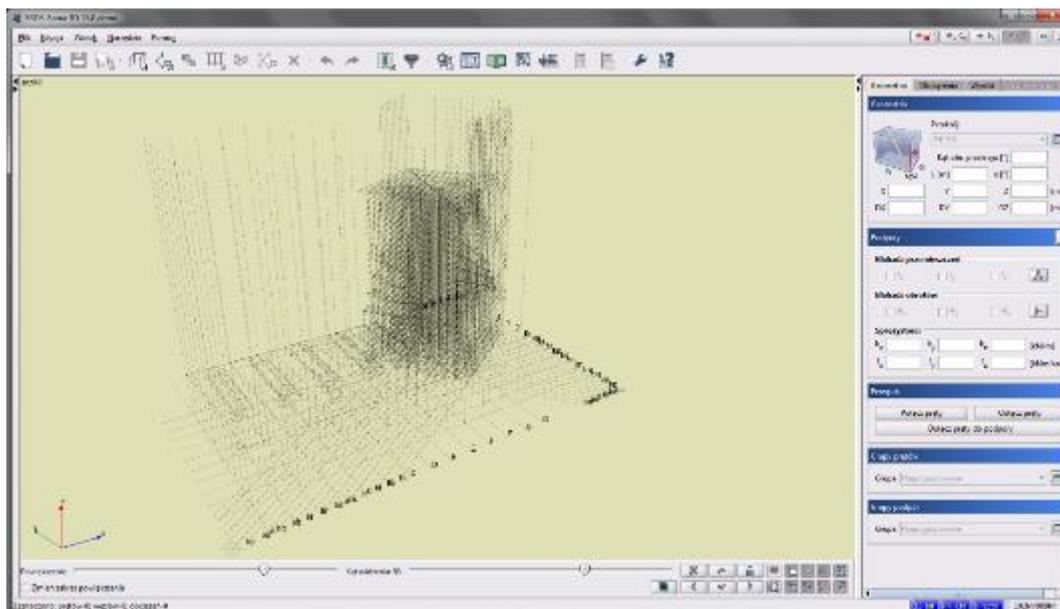


Fig. 13. Sample initial drawing in the R3D3-Rama 3D software

8.2. Export project to OBJ format

A building designed in the ArCADia-ARCHITECTURE software may be transferred to advanced 3D visualization programs (Maja, 3D Studio). By using the *Project export to OBJ format*, the entire building, along with its 3D geometry, is transferred to software enabling full 3D editing and the option to create photorealistic visualizations.

Activation:

- *System* ribbon => logical group *Communication* =>  *Export project to OBJ format*



Drawing 148. OBJ file data export window

8.2.1. Saving a project presentation

New version of the ArCADia 6.0 software includes new module: ArCADia-3D MAKER which enables to save 3D projects and ArCADia-3D VIEWER which allows for viewing saved 3D projects without the necessity to have the ArCADia software installed.

Compatibility with other programs

There are two variations for saving a project presentation: with or without browser. Browser, i.e. ArCADia-3D VIEWER can be downloaded from the website.

8.2.1.1. Saving a 3D presentation

This option enables to save a project and include the browser. It means, that a presentation saved in this way can be given to someone who wants to see the project but doesn't have ArCADia software. The browser will open the ArCADia-3D VIEWER window and enable to view the saved project from every direction but without the possibility to make any changes or save.

Activation:

- *System* ribbon => logical group *Communication* =>  *Save the 3D presentation*

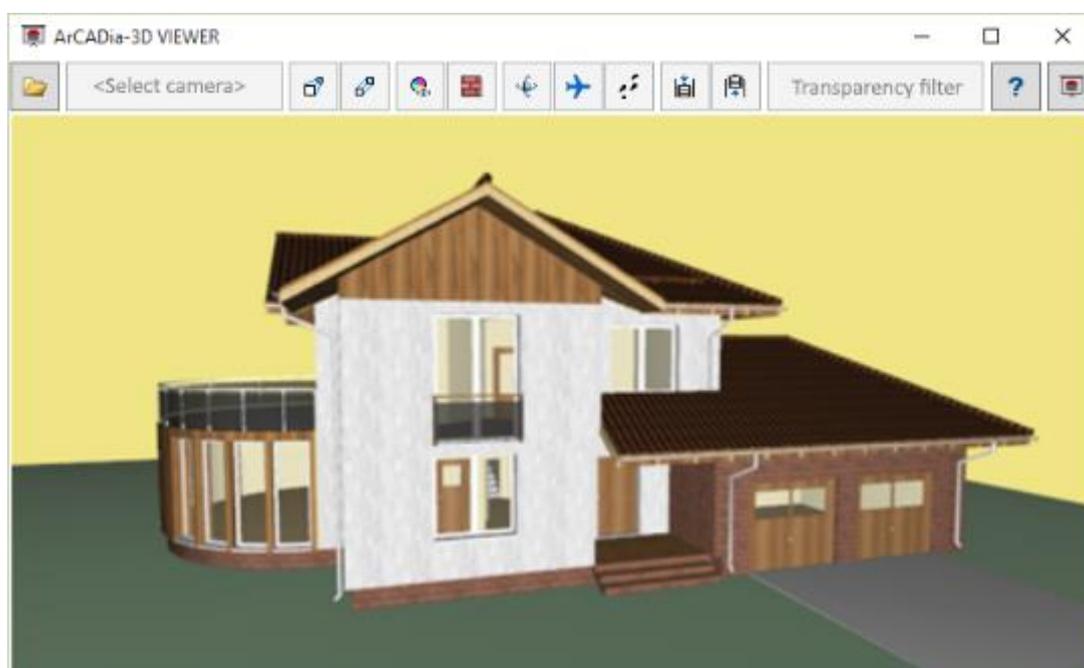
After invoking the command, the save presentation window will open, where you need to indicate the saving directory and name, and confirm by clicking *OK* button.

Presentation will be saved in an *.exe* file which can be opened on any computer, without ArCADia software installed.

To view the presentation double-click the file and the ArCADia-3D VIEWER will open.

NOTE:

Before the ArCADia-3D VIEWER window will open, a message may appear to inform that some necessary components are missing. In this case, choose No to answer the question whether to continue, then the software will open a website from which you should download and install a given patch for your operating system.



Drawing 149. ArCADia-3D VIEWER window with a sample project

Tab. 1. ArCADia-3D VIEWER or project browser options

Compatibility with other programs

	<i>Open file</i>	Opens a file containing 3DS presentation data (.a3d files)
	<i><Select a camera></i>	Shows the default camera views.
	<i>Perspective view</i>	Shows the perspective view of the building.
	<i>Axonometric view</i>	Shows the axonometric view of the building.
	<i>Show layer colours from Project Manager</i>	Displays the building with colors for the elements selected for groups.
	<i>Show surfaces defined in elements</i>	Shows the building with selected materials and textures.
	<i>Orbit mode</i>	Project viewing mode in which the camera is set on an orbit around the project.
	<i>Flight mode</i>	Project viewing mode in which the camera can be placed inside the project and move in the direction determined by the mouse.
	<i>Walk mode</i>	Project viewing mode which enables a tour of the project.
	<i>Lower the camera position</i>	Lowers the observing position.
	<i>Raise the camera position</i>	Raises the observing position.
	<i>Transparency Filter</i>	It enables to glaze an entire branch, e.g. Architecture, to show some other branch, e.g. inside the building.

8.2.1.2. Saving the 3D presentation data

To save a project presentation for someone who already has the ArCADia-3D VIEWER project browser it is enough to save the data for the presentation (this allows for a project file to be significantly smaller in size and sent by e-mail).

Activation:

- *System* ribbon => logical group *Communication* =>  *Save the 3D presentation data*

After invoking the command, the save presentation window will be displayed where you need to indicate the file saving directory and name. The created presentation may be opened from ArCADia-3D VIEWER window by choosing the  *Open file* icon.

8.2.2. Export to Ceninwest software

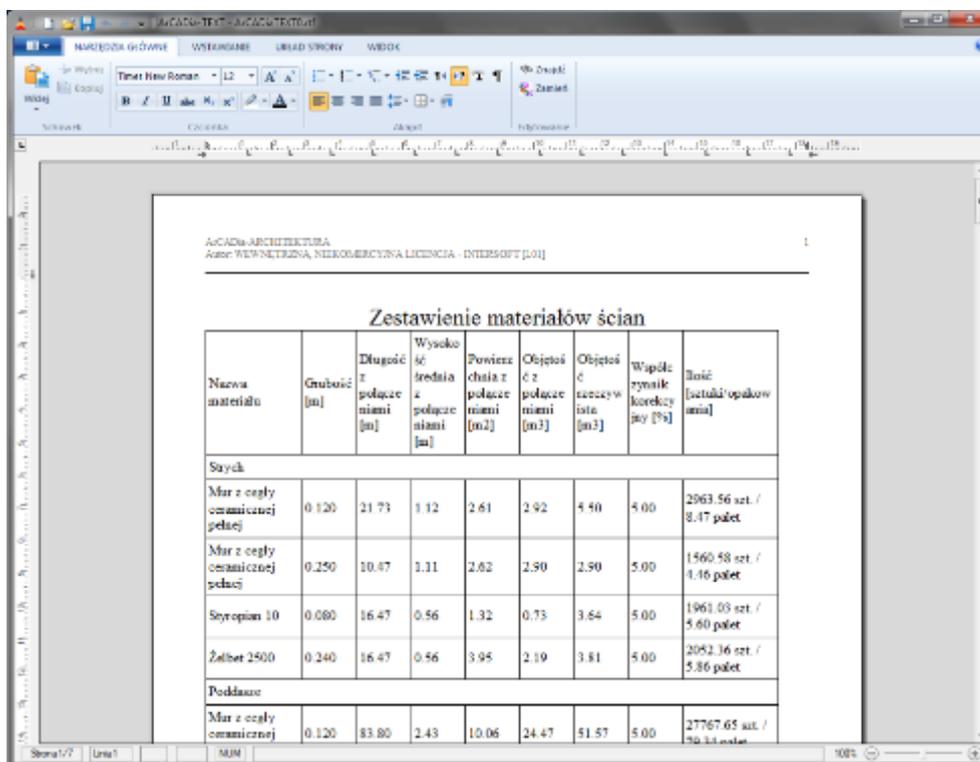
Ceninwest allows for the comprehensive forecast of an investment project value, in line with the applicable regulations, which includes, among others, purchasing a plot, design and preparatory works, construction of standard objects, installations and equipment. From for ArCADia system to the cost estimate software, you export the element and material lists inserted in the project.

8.2.3. Save RTF file

All the lists and tables from the ArCADia BIM may be exported into *RTF* format.

Compatibility with other programs

After selecting the list, in the edition window, select the icon  *Save to the text editor file (RTF)*, the ArCADia-TEXT editor will open. There you can correct the list, introduce e.g. logo in the form of a raster file (.bmp.jpeg.tif.wmf.png.gif.emf) or the page numbering. The editor allows to print or save in formats: .rtf, .doc, .docx, .txt, .pdf.



The screenshot shows the ArCADia-TEXT editor window with a table titled "Zestawienie materiałów ścian" (Wall Materials Summary). The table has 8 columns: Name of material, Thickness [m], Length of connection [m], Average height of connection [m], Surface area of connection [m²], Volume of connection [m³], Weight correction factor [%], and Quantity [sets/packages].

Nazwa materiału	Grubość [m]	Długość z połączeniami [m]	Wysokość średnia z połączeniami [m]	Powierzchnia z połączeniami [m ²]	Objętość z połączeniami [m ³]	Objętość rzeczywista [m ³]	Współczynnik korekcyjny [%]	Ilość [zestaw/opakowania]
Ścianki								
Mur z cegły ceramicznej pełnej	0.120	21.73	1.12	2.61	2.92	4.50	5.00	2063.56 szt. / 8.47 palet
Mur z cegły ceramicznej pełnej	0.250	10.47	1.11	2.62	2.90	2.90	5.00	1560.58 szt. / 4.16 palet
Strycion 10	0.080	16.47	0.56	1.32	0.73	3.64	5.00	1961.03 szt. / 5.60 palet
Żalbet 2500	0.240	16.47	0.56	3.95	2.19	3.81	5.00	2052.16 szt. / 5.86 palet
Podłazce								
Mur z cegły ceramicznej	0.120	83.80	2.43	10.06	24.47	51.57	5.00	27767.65 szt. / 70.14 palet

Fig. 14. ArCADia-TEXT editor will open window

8.2.4. Save CSV file

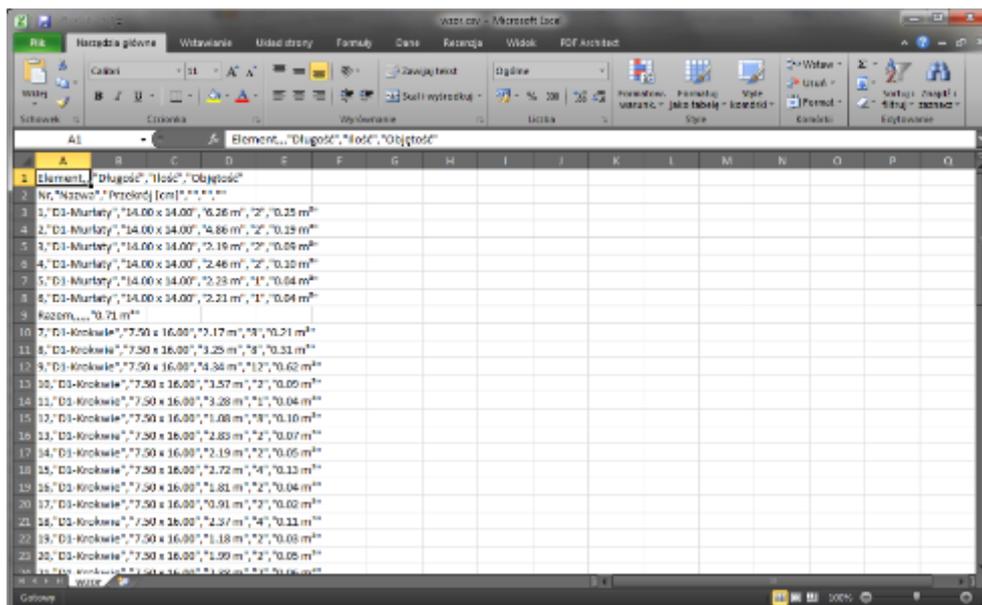
All the lists and tables from ArCADia BIM may be exported into [CSV](#) format.

After selecting a list in the edition window, select the  *Save to spreadsheet file (CSV)* and save the file. Then wait until a software that can handle [CSV](#) files is started.

NOTE: the default separator for data exported into a CSV file (rows and columns separator) is a comma; this means that if the software that opens automatically has another separator defined, the data will not be parsed properly.

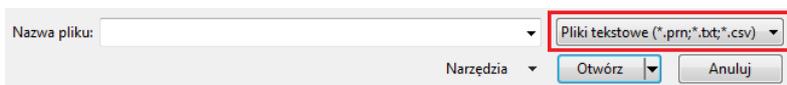
An example of a program that can handle [CSV](#) files is Microsoft Excel. The default column separator in this program is a [tabulation mark](#) and if the CSV file is exported from ArCADia and opened, it will not include division into columns.

Compatibility with other programs



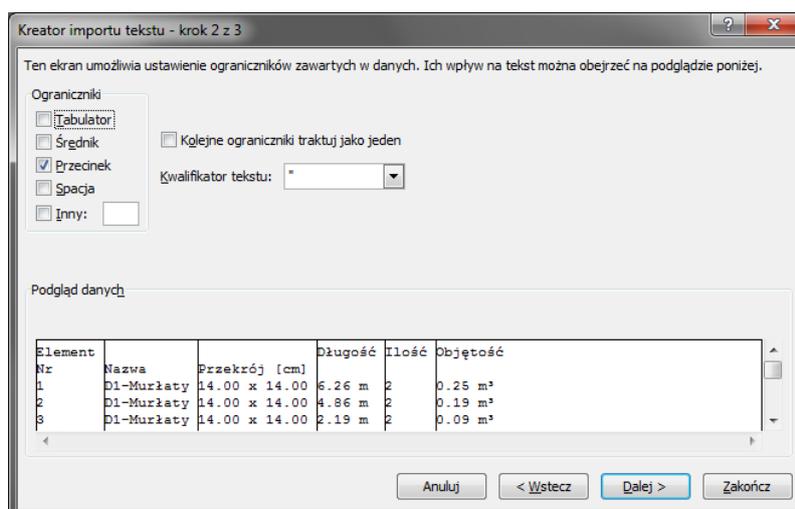
Drawing 150. By default a list is created in Microsoft Excel

In the case mentioned above the user should close the opened file (not the software) and select **File⇒Open** from the menu. In the **Opening** window select Type: **Text files (*.prn;*.txt;*.csv)** and open the saved list file.



Drawing 151. Fragment of the file opening window with the opened document format change selected

After selecting a file the **Text import wizard** window will appear, where in step 2 the user should change the **Separator** from **Tabulation mark** into a Comma (first and third step in the conversion may simply be confirmed).



Drawing 152. Second conversion step for exported lists

Once conversion is finished the exported list will be properly displayed in Microsoft Excel.

Compatibility with other programs

Element	Nr	Nazwa	Przekrój [cm]	Długość	Ilość	Objętość	
	1	D1-Murlaty	14,00 x 14,00	6,26 m	2	0,25 m ³	
	2	D1-Murlaty	14,00 x 14,00	4,86 m	2	0,15 m ³	
	3	D1-Murlaty	14,00 x 14,00	2,19 m	2	0,06 m ³	
	4	D1-Murlaty	14,00 x 14,00	2,46 m	2	0,10 m ³	
	5	D1-Murlaty	14,00 x 14,00	2,23 m	1	0,04 m ³	
	6	D1-Murlaty	14,00 x 14,00	2,23 m	1	0,04 m ³	
	Razem						0,73 m ³
	7	D1-Krokwie	7,50 x 16,00	2,17 m	8	0,21 m ³	
	8	D1-Krokwie	7,50 x 16,00	3,25 m	8	0,31 m ³	
	9	D1-Krokwie	7,50 x 16,00	4,34 m	12	0,62 m ³	
	10	D1-Krokwie	7,50 x 16,00	3,57 m	2	0,05 m ³	
	11	D1-Krokwie	7,50 x 16,00	3,26 m	1	0,04 m ³	
	12	D1-Krokwie	7,50 x 16,00	1,06 m	8	0,10 m ³	
	13	D1-Krokwie	7,50 x 16,00	2,83 m	2	0,07 m ³	
	14	D1-Krokwie	7,50 x 16,00	2,19 m	2	0,05 m ³	
	15	D1-Krokwie	7,50 x 16,00	2,72 m	4	0,11 m ³	
	16	D1-Krokwie	7,50 x 16,00	1,81 m	2	0,04 m ³	
	17	D1-Krokwie	7,50 x 16,00	0,91 m	2	0,02 m ³	
	18	D1-Krokwie	7,50 x 16,00	2,37 m	4	0,11 m ³	
	19	D1-Krokwie	7,50 x 16,00	1,18 m	2	0,03 m ³	
	20	D1-Krokwie	7,50 x 16,00	1,59 m	2	0,05 m ³	
	21	D1-Krokwie	7,50 x 16,00	1,18 m	2	0,03 m ³	
	22	D1-Krokwie	7,50 x 16,00	1,18 m	2	0,03 m ³	
	23	D1-Krokwie	7,50 x 16,00	1,59 m	2	0,05 m ³	
	24	D1-Krokwie	7,50 x 16,00	1,18 m	2	0,03 m ³	
	25	D1-Krokwie	7,50 x 16,00	1,18 m	2	0,03 m ³	

Drawing 153. An example list of roof wooden structural elements exported into Microsoft Excel

9.COMMANDS TABLE

Commands table

Below is a list of the commands available in all modules of ArCADia BIM system.

Features of ArCADia BIM are divided into modules: basic, ArCADia-START (basic options of ArCADia BIM) and the branch modules: ArCADia-ARCHITECTURE, ArCADia-3D MAKER, ArCADia-IFC, ArCADia-CEILINGS TERIVA, ArCADia-ESCAPE ROUTES, ArCADia-ELECTRICAL INSTALLATIONS, ArCADia-POWER NETWORKS, ArCADia-DISTRIBUTION BOARDS, ArCADia-TELECOMMUNICATIONS NETWORKS, ArCADia-WATER SUPPLY INSTALLATIONS, ArCADia-SEWAGE INSTALLATIONS, ArCADia-SEWAGE SYSTEMS, ArCADia-GAS INSTALLATIONS, ArCADia-EXTERNAL GAS INSTALLATIONS, ArCADia-HEATING INSTALLATIONS, ArCADia-REINFORCED CONCRETE SLAB i ArCADia-REINFORCED CONCRETE COLUMN and ArCADia-SURVEYOR.

9.1. Basic options

The following options are described in the help file of the ArCADia system, the icon is at the *System* ribbon.

Tab. 12. Functions (no licence required) of *System* and *Architecture* ribbons

Icon	Opcja	Opis
	<i>Show/Hide Project Manager</i>	Recall or hide window of level management.
	<i>Flatten document</i>	Explodes ArCADia BIM objects into appropriate CAD layers.
	<i>Fix document</i>	<i>Checks and corrects possible errors in the project.</i>
	<i>Restore default view</i>	Restore default view to initial location.
	<i>Show/Hide 3D preview</i>	Recall or hide preview window of the building solid.
	<i>Insert ruler</i>	Inserts auxiliary object – ruler with 10 cm scale.
	<i>Template Manager</i>	Stores element settings configured by user as default.
	<i>Modules and licences</i>	Status information of installed version (licensed or demo version).
	<i>Options</i>	It allows to download updates from web server and change the standard used in calculations of usable areas.
	<i>About ArCADia</i>	Information about installed version.
	<i>Show help</i>	Displays help window.

In the ArCADia BIM system the above options are extended with functions of designing Teriva Ceilings, they are in a separate toolbar and ribbons. All information can be found in the help file of this module.

Tab. 13. Functions of ArCADia-CEILING TERIVA from *Ceilings* ribbon

Ikona	Opcja	Opis
	<i>Insert framed ceiling above zone</i>	Insert framed ceiling above zone

Commands table

	<i>Insert framed ceiling</i>	Insert framed ceiling
	<i>Insert framed ceiling with rectangle</i>	Insert framed ceiling with rectangle
	<i>Insert framed ceiling above active level</i>	Insert framed ceiling above active level
	<i>Insert framed ceilings above zones</i>	Insert framed ceilings above zones
	<i>Insert hole in ceiling</i>	Insert hole in ceiling
	<i>Insert ceiling beam</i>	Insert ceiling beam
	<i>Insert reinforcing rib</i>	Insert reinforcing rib
	<i>Insert trimmer</i>	Insert trimmer
	<i>Insert reinforcing beam</i>	Insert reinforcing beam through one point
	<i>Insert reinforcing beam (2 points)</i>	Insert reinforcing beam through two points
	<i>Distribute nets on active level</i>	Distribute nets on active level
	<i>Insert flat net</i>	Flat net
	<i>Insert folded net</i>	Folded net
	<i>Check correctness of ceiling elements</i>	Check correctness of ceiling elements
	<i>Insert constructional section</i>	Insert constructional section
	<i>Insert Stropex ceiling elements list</i>	Insert Stropex ceiling elements list
	<i>Display help</i>	Display help

9.2. ArCADia-START

The following options are described in the help file of the ArCADia system, the icon is at the Home ribbon.

Tab. 14. Functions of ArCADia-START module from *System* ribbon:

Ikona	Opcja	Opis
	<i>Building wizard</i>	This option creates a building with a selected number of levels and divides them into specific views.
	<i>Insert projection</i>	It introduces the projection view in the project.
	<i>Type Library</i>	Dialogue box for management of types used in the document and types existing in the global library.
	<i>Change type</i>	The option allows for changing all the elements of a selected type.
	<i>Show 2D/3D Object explorer</i>	Opens the window of <i>Object Explorer</i> allowing for selection and insertion of 2D and 3D objects from the library.
	<i>Insert camera</i>	Inserts camera symbol into the Layout and saves parameters of its view.

Commands table

	<i>Insert title block</i>	Inserts camera symbol into the Layout and saves parameters of its view.
	<i>Design title block</i>	Defines title block, size and contents of the boxes, and then saves it into the project or Application library.
	<i>Compare documents</i>	This options compares the two selected documents by marking new, changed, or deleted elements with colours.
	<i>Merge documents</i>	The software creates one document from the two documents originating from one source, merging the branches from a selected project.
	<i>Create project package</i>	Packages objects and textures associated with the standard library into folder that should be transferred along with the project.
	<i>Detect collisions/intersections</i>	Shows collisions/intersections between elements of the entire ArCADia BIM (e.g. between elements of gas and electrical networks).
	<i>Display collisions/intersections</i>	Displays report of colliding/intersecting elements.
	<i>Remove collisions/intersections</i>	Removes all occurrences of collisions/intersections from the project.

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *Architecture* ribbon.

Tab. 15. Functions of ArCADia-START module from *Architecture* ribbon:

Icon	Option	Description
	<i>Insert wall</i>	Inserts layer walls into the level Layout.
	<i>Insert virtual wall</i>	Inserts virtual walls defining the room area into the level Layout.
	<i>Insert binding joist</i>	Inserts binding joist into the Layout.
	<i>Insert column</i>	Inserts rectangular or round section column into the Layout.
	<i>Insert window</i>	Inserts window opening into the walls, including symbol and description.
	<i>Insert door</i>	Inserts door opening into the walls, including symbol and description.
	<i>Insert stairs</i>	Inserts stairs into the Layout by selecting subsequent flights of stairs and landings.
	<i>Insert winder stairs</i>	Inserts winder stairs into the Layout by pointing subsequent parts of the flight of stairs.
	<i>Insert chimney</i>	Inserts a ventilation chimney into the floor plan.
	<i>Insert chimney shaft</i>	Inserts, shaft, group of chimneys located one by one or arranged with a given space between elements.

Commands table

	<i>Insert chimney flue</i>	Inserts information about chimney flue and vent stack inlets into the Layout.
	<i>Insert modular axes</i>	Inserts modular axes into the Layout by setting quantities of vertical and horizontal axes, spacing between them, description (axis label) and insertion location.
	<i>Insert any dimension</i>	Inserts dimension by pointing start and end point of the element being dimensioned.
	<i>Insert angular dimension</i>	Inserts dimension by defining the angle between elements being dimensioned.
	<i>Insert woodwork list</i>	Inserts woodwork list into the project.
	<i>Insert room list</i>	Inserts room list into the project.

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *Architecture* ribbon.

Tab. 16. Functions of ArCADia- START module from *Ceilings* ribbon:

Icon	Option	Description
	<i>Insert ceiling automatically</i>	Inserts floor slab into the Layout and automatically detects outline of the level drawn.
	<i>Insert ceiling with rectangle tool</i>	Inserts rectangular outline of floor slab by selecting three points.
	<i>Insert ceiling opening</i>	Inserts opening of any shape in floor slab.

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *Architecture* ribbon.

Tab. 17. Functions of ArCADia-START module from *Landscape* ribbon:

Icon	Option	Description
	<i>Insert spot height</i>	Inserts spot height defining the terrain geometry.
	<i>Insert benchmark line</i>	Inserts benchmark line of a given elevation by selecting the section.
	<i>Insert ground surface hole</i>	Cuts hole in the ground surface.
	<i>Automatically inserts ground surface hole</i>	Cuts out a hole in the ground of the same shape as active or lowest level (depending on whether the level or the terrain is active during the cutting).
	<i>Convert texts into spot heights</i>	Changes entered numeric values into benchmarks.

Commands table

	<i>External pipe</i>	Terrain existing systems during collision checking by representing them in all the Views.
	<i>External object</i>	During collision checking it simulates existing objects in the area, visualises them in all views.

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *Architecture* ribbon.

Tab. 18. Functions of ArCADia-START module from *Object Explorer* window:

Icon	Option	Description
	<i>Create a 2D object</i>	Expands the software library by a new 2D object indicated by the user.
	<i>Create a layout</i>	It groups the system elements into one layout and treats it as one object which can, together, be shifted and deleted, but it is possible, at any time, to split it into primary elements.

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *Architecture* ribbon.

Tab. 19. Functions of ArCADia-START module from *3D View* window:

Ikona	Opcja	Opis
	<i>Save scene as image</i>	Saves the current view from the 3D window as a <i>BMP, JFG</i> or <i>PNG</i> file.

9.3. ArCADia-MAKER

The following options are described in the help file of the ArCADia BIM system, the icon is on the *System* ribbon.

Tab. 20. Functions of ArCADia-MAKER from *System* ribbon.

Ikona	Opcja	Opis
	<i>Save 3D presentation</i>	Saves the file together with the browser, which allows for viewing the project in a 3d window without the ArCADia software installed.
	<i>Save data to 3D presentation</i>	Saves file to a 3D presentation, without including the browser in the file.

Commands table

9.4. ArCADia-IFC

The following options are described in the help file of the ArCADia-IFC module the icon is on the *System* ribbon.

Tab. 21. Functions of ArCADia-IFC from *System* ribbon

Icon	Option	Description
	<i>Import data from IFC format</i>	Imports entire project to <i>IFC</i> format. Imports layouts of selected levels from ArCon.
	<i>Export data to IFC format</i>	Exports entire project to <i>IFC</i> file. Imports layouts of selected levels from ArCon.

9.5. ArCADia-ARCHITECTURE

The following options are described in the help file of the ArCADia-ARCHITECTURE module, the icon is at the *System* ribbon.

Tab. 22. Functions of ArCADia-ARCHITECTURE from *System* ribbon:

Icon	Option	Description
	<i>Edit material database</i>	Allows for modification of existing materials and addition of user-defined material into global database.
	<i>Insert section</i>	Inserts Section into the project.
	<i>Insert light source</i>	Inserts a light source into the scene, reflected in the rendered scene.
	<i>Import data from ArCon</i>	Imports layouts of selected levels from ArCon.
	<i>Export data to ArCon</i>	Imports entire project to <i>IFC</i> format. Imports layouts of selected levels from ArCon.
	<i>Export project to OBJ</i>	Exports project to <i>OBJ</i> format. Imports layouts of selected levels from ArCon.
	<i>trace export to R3D3-Rama 3D</i>	Moves the data (outlines of roofs and grids of modular axes) to the installed R3D3-3D Frame software in version 15.

Tab. 23. Functions of ArCADia-ARCHITECTURE module from *Architecture* and *Ceilings* ribbons:

Icon	Option	Description
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Commands table

	<i>Insert curved wall</i>	Inserts curved wall by selecting 3 points on the arc.
	<i>Convert line into wall</i>	Converts selected polyline/line into the user-defined wall. Selected polyline/line defines insertion edge/axis.
	<i>Draw wall by 3 points</i>	Draws walls by indicating its width and length in the drawing.
	<i>Convert line into virtual wall</i>	Converts selected polyline/line into virtual wall.
	<i>Insert special window/door</i>	Inserts windows and doors defined during creation, that can be ended, for example with arc, or allows the window arrangement to be customised.
	<i>Insert opening</i>	Creates opening in the wall.
	<i>Insert steel column</i>	Inserts steel columns and steel elements as horizontal, vertical, or diagonal elements.
	<i>Import F3D</i>	It introduces the structure designed in the R3D3-3D software.
	<i>Insert ceiling</i>	Inserts a floor slab into the Layout by selecting subsequent corners of the outline.
	<i>Insert floor on ground</i>	Inserts a floor on ground in all rooms of active level.
	<i>Insert pad footing</i>	Inserts a reinforced concrete spot footings into the foundation layout.
	<i>Insert strip footing</i>	Inserts a reinforced concrete substructure benches into the substructures layout.
	<i>Convert line into strip footing</i>	Convert a polyline/line into substructure bench by selecting polyline/line and edge/insertion axis.
	<i>Insert ramp</i>	Inserts a ramp into the Layout by indicating its subsequent flights and landings.
	<i>Insert spiral stairs</i>	Inserts spiral stairs into the Layout by indicating their centre and radius.
	<i>Insert spiral stairs by 3 point</i>	Inserts spiral stairs into the Layout by indicating three points located on the outline.
	<i>Insert roof</i>	Inserts a roof into the Layout by pointing the subsequent corners of the outline.
	<i>Insert roof with rectangle tool</i>	Roof is inserted by selecting length of one side and width of rectangular outline. Rectangle can be inserted at any angle.
	<i>Insert roof automatically</i>	Inserts a roof into the Layout and automatically detects outline of the active level.
	<i>Insert dormer window</i>	Inserts a window into selected roof slope
	<i>Insert roof hatch</i>	Inserts a roof hatch on a roof piece.
	<i>Drainage</i>	Inserts a solar collector on the roof slope.

Commands table

	<i>Insert dormer opening</i>	Inserts a dormer into the selected roof plane.
	<i>Insert roof opening</i>	Inserts a roof opening of any, user defined polygonal shape.
	<i>Insert chimney cowl</i>	Inserts ventilation or exhaust chimney cowl.
	<i>Insert snow guard</i>	Inserts snow guard in one of the six types of the guard.
	<i>Automatically insert gutters</i>	Roof gutters are inserted automatically on roof and dormer's eaves.
	<i>Insert a drain pipe</i>	Drain pipes are inserted into the already inserted gutters from the roof to the terrain.
	<i>Automatically insert ridge tile</i>	Ridge tiles are place automatically on roof gables and corners.
	<i>Insert gutter</i>	Inserts a gutter on a selected roof or dormer eave.
	<i>Insert gutter through two points</i>	The gutter is inserted on a selected fragment of the eave.
	<i>Insert ridge tile</i>	Inserts ridge tile on the selected roof edge and dormer.
	<i>Insert plate</i>	Inserts a plate of any polygonal shape.
	<i>Insert rectangular plate by picking axis or edge</i>	Inserts a rectangular plate drawn using an edge or axis (this option for example allows binding joists and beams to be simulated).
	<i>Insert rectangular plate picking length and width</i>	Inserts plate of any rectangular shape.
	<i>Opening</i>	It introduces the hole in the body.
	<i>Insert wind rose by point</i>	Inserts a north arrow into the Layout by specifying the angle and insertion point.
	<i>Insert wind rose by two points</i>	Inserts a north arrow into the Layout by selecting two points.
	<i>Insert dimensions of selected objects</i>	Inserts dimensions of interconnected architectural objects, e.g. walls with woodwork inserted.
	<i>Insert dimensions for entire drawing</i>	Insert dimensions of active level Layout on four dimension lines: woodwork and opening, walls and rooms, external protruding elements and total external dimension.
	<i>Insert dimension of curved wall radius</i>	Inserts radius dimension for curved wall.
	<i>Insert dimensions of angularly selected objects</i>	Inserts angular dimension by selecting two elements the relative position of which needs to be dimensioned.
	<i>Insert spot height</i>	Inserts spot height into the Layout and Section.

Commands table

	<i>Insert object label</i>	Inserts flag with material description into the Layout or Section of the building.
	<i>Insert area and cubic capacity count</i>	Inserts a table of construction areas, charring rooms, net and gross building areas, cubatures, minimum plot size, slant, roof height, etc.
	<i>List of bar elements</i>	Inserts a table of specifications of all bar elements in the document, both those entered with bar elements and those imported from the R3D3-3D Frame.
	<i>Insert count of roof areas</i>	Inserts a table with drawn and calculated roofs and dormers together with information about the length of the eaves, gables, corners, top edges, and baskets.
	<i>Insert roof material list</i>	Inserts a table listing materials used in roofs and dormers.
	<i>Insert roof accessories list</i>	Inserts a table calculating all the roof elements: windows and roof hatches, chimney cowls, tiles, snow guards, gutters and drain pipes.
	<i>Insert list of selected roof accessories</i>	Inserts a table counting only selected accessories.
	<i>Insert wood list</i>	Inserts a table of wooden elements, which were given as structural elements in R3D3 Frame 3D software.
	<i>Material list</i>	Inserts tables of material specifications of elements selected in the Material specifications window.
	<i>Material list for the selected objects</i>	Inserts tables of material lists for elements marked on the projection and confirmed in the <i>Material list</i> window.
	<i>Export of selected material specifications</i>	Saves the marked specifications to the files: .rtf or.csv or moves them to the Ceninvest software.

Tab. 24. Functions of ArCADia-ARCHITECTURE module from *Object Explorer* window:

Icon	Option	Description
	<i>Import 3D object</i>	Import 3D objects with the extension <i>3ds</i> , <i>aco</i> or <i>o2c</i> into global database.
	<i>Export to xobj3d</i>	Saves selected 3D objects as <i>xobj3d</i> into global database.

Tab. 25. Functions of ArCADia-ARCHITECTURE module from *3D View* window:

Icon	Option	Description
	<i>Rendering</i>	Creates 2D visualisation of the building being designed which next is saved as <i>BMP</i> file.
	<i>Multirendering</i>	Saves photorealistic views for the cameras defined in the project.

Commands table

9.6. ArCADia-ESCAPE ROUTES

The following options are described in the help file of the ArCADia-ESCAPE ROUTES systems, the icon is at the *Escape* ribbon.

Tab. 26. Functions of ArCADia-ESCAPE ROUTES module from *Escape* ribbon.

Icon	Option	Description
	Insert escape plan border	Inserts an escape plan border.
	Insert fire plan border	Inserts a fire plan border.
	Insert polygonal escape area by indicating the number and position of corners	Inserts a polygonal <i>escape area</i> by indicating the number and position of its corners.
	Insert polygonal stairs area by indicating the number and position of corners	Inserts a polygonal <i>stairs area</i> by indicating the number and position of its corners.
	Insert polygonal passable area by indicating the number and position of corners	Inserts a polygonal <i>passable area</i> by indicating the number and position of its corners.
	Insert polygonal impassable area by indicating the number and position of corners	Inserts a polygonal <i>impassable area</i> by indicating the number and position of its corners.
	Insert polygonal specific hazard area by indicating the number and position of corners	Inserts a polygonal <i>specific hazard area</i> by indicating the number and position of its corners.
	Insert polygonal extinguishing water area by indicating the number and position of corners	Inserts a polygonal <i>extinguishing water area</i> by indicating the number and position of its corners.
	Insert rectangular escape plan area by indicating length and width	Inserts a rectangular <i>escape plan area</i> by indicating its length and width.
	Insert rectangular stairs area by indicating length and width	Inserts a rectangular <i>stairs area</i> by indicating its length and width.

Commands table

	Insert rectangular passable area by indicating length and width	Inserts a rectangular <i>passable area</i> by indicating its length and width.
	Insert rectangular impassable area by indicating length and width	Inserts a rectangular <i>impassable area</i> by indicating its length and width.
	Insert rectangular specific hazard area by indicating length and width	Inserts a rectangular <i>specific hazard</i> by indicating its length and width.
	Insert rectangular extinguishing water area by indicating length and width	Inserts a rectangular <i>extinguishing water area</i> by indicating its length and width.
	Insert observer	Inserts an observer.
	Automatic direction	Automatically inserts direction arrows.
	Left	Inserts a left direction arrow.
	Right	Inserts a right direction arrow.
	Straight	Inserts a straight direction arrow.
	Left and Right	Insert a bidirectional arrow
	Show symbol explorer	Displays the symbol explorer window.
	Insert Title block	Inserts an Title block with information concerning the project.
	Insert general plan	Inserts a general plan for the project.
	Insert legend	Inserts a legend with a list an descriptions of the elements used in the plan.
	Help	Wyświetla okno pomocy.

9.7. ArCADia-ELECTRICAL INSTALLATION

The following options are described in the help file of the ArCADia-ELECTRICAL INSTALLATIONS module, the icon is at the *Electric* ribbon.

Tab. 27. Functions of ArCADia-ELECTRICAL INSTALLATIONS module from *Electric* ribbon.

Icon	Option	Description
	Insert distribution board	Inserts a distribution board with a description.

Commands table

	Insert electric socket	Insert electric socket with a description.
	Insert lighting fixture	Inserts a lighting fixture with a description.
	Insert electric switch	Inserts an electric switch with a description.
	Insert electric conductor	Insert an electric conductor with a description.
	Insert distribution box	Inserts a distribution box with a description.
	Insert ceiling cable conduit	Inserts a ceiling cable conduit with a description.
	Insert schematic diagram	Generates a schematic diagram of the installation
	Insert item list	Inserts a symbols legend with a description.
	Insert selected elements list	Inserts symbols legend along with item labels of the items selected in the projection
	Generate material list	Generates quantitative lists of materials used in the project.
	Insert material list for selected elements	Generates a quantitative material list for the elements selected in the projection
	Electric installation report	Generates a report presenting technical calculations and the validity of the designed network.
	Options	Displays the options window.
	Show help	Displays the help window.

9.8. ArCADia-ELECTRICAL INSTALLATION PLUS

The following options are described in the help file of the ArCADia-ELECTRICAL INSTALLATIONS PLUS module, the icon is at the *Electric* ribbon.

Tab. 28. Functions of ArCADia-ELECTRICAL INSTALLATIONS PLUS module from *Electric* ribbon.

Icon	Option	Description
	Cable tray	Inserts a cable tray.
	Vertical cable tray	Inserts a vertical cable tray.
	Cable rack	Inserts a cable rack.
	Vertical cable rack	Inserts a vertical cable rack.
	Cable duct	Inserts a cable duct.
	Vertical cable duct	Inserts a vertical cable duct.
	Export DIALux	Exports the room table to DIALux software.
	Import DIALux	Imports.stf files from DIALux software.

Commands table

9.9. ArCADia-POWER NETWORKS

The following options are described in the help file of the ArCADia-POWER NETWORKS module, the icon is at the *Electric* ribbon.

Tab. 29. Functions of ArCADia-POWER NETWORKS module from *Electric* ribbon.

Icon	Option	Description
	<i>Insert distribution board</i>	Inserts a distribution board along with a description.
	<i>Insert transformer station</i>	Inserts a transformer station along with a description.
	<i>Insert connection point</i>	Inserts a connection point along with a description.
	<i>Insert cable joint</i>	Inserts a cable joint along with a description.
	<i>Insert cable joint box</i>	Inserts a cable joint box along with a description.
	<i>Insert power pole</i>	Inserts a power pole along with a description.
	<i>Insert buried line</i>	Inserts a buried line along with a description.
	<i>Insert overhead line</i>	Inserts an overhead line along with a description.
	<i>Insert survey point</i>	Inserts survey points on a projection along with a description.
	<i>Insert protective pipe</i>	Inserts a protective pipe along with a description.
	<i>Insert schematic diagram</i>	Generates a schematic diagram of the designed network.
	<i>Generate material list</i>	Generates a list of materials used in the design.
	<i>Insert material list for selected elements</i>	Inserts material list from the installation elements selected on the projection.
	<i>Insert item list</i>	Inserts an item list of the sewage installation along with the graphical symbols, names, markings and quantity.
	<i>Insert selected elements list</i>	Inserts a list of installation elements selected on the projection.
	<i>Generate report</i>	Generates a report presenting technical calculations and the validity of the designed network.
	<i>Insert a list of coordinates for survey points</i>	Generates a report containing the X, Y survey coordinates in a RTF file.
	<i>Program option settings</i>	Enables the use of standard options for the entire project.
	<i>Show help</i>	Displays the help window.

Commands table

9.10. ArCADia-DISTRIBUTION BOARDS

The following options are described in the help file of the ArCADia-DISTRIBUTION BOARDS module, the icon is at *Distribution board* ribbon.

Tab. 30. Functions from ArCADia-DISTRIBUTION BOARDS module from *Distribution board* ribbon:

Icon	Option	Description
	<i>Insert electrical connection line</i>	Make is possible to create electrical connections between items.
	<i>Earthing</i>	Inserts the symbol of a earthing along with a description.
	<i>Insert circuit breaker</i>	Inserts the symbol of a circuit breaker along with a description.
	<i>Insert load switch</i>	Inserts the symbol of a load switch along with a description.
	<i>Insert arrester</i>	Inserts the symbol of an arrester along with a description.
	<i>Insert fuse</i>	Inserts the symbol of a fuse along with a description.
	<i>Insert contactor</i>	Inserts the symbol of a contactor along with a description.
	<i>Insert inverter</i>	Inserts the symbol of an inverter along with a description.
	<i>Insert Soft start</i>	Inserts the symbol of a soft start along with a description.
	<i>Insert relay</i>	Inserts the symbol of a relay along with a description.
	<i>Insert switch</i>	Inserts the symbol of a switch along with a description.
	<i>Insert programmer</i>	Inserts the symbol of a programmer along with a description.
	<i>Insert controller</i>	Inserts the symbol of a controller along with a description.
	<i>Insert transformer</i>	Inserts the symbol of a transformer along with a description.
	<i>Insert current transformer</i>	Inserts the symbol of a current transformer along with a description.
	<i>Insert sensor</i>	Inserts the symbol of a sensor along with a description.
	<i>Insert signaling</i>	Inserts the symbol of a signalling device along with a description.
	<i>Insert socket</i>	Inserts the symbol of a socket along with a description.
	<i>Insert electrical energy meter</i>	Inserts the symbol of an electrical energy meter along with a description.
	<i>Insert analyser</i>	Inserts the symbol of an analyser along with a description.
	<i>Insert voltmeter</i>	Inserts the symbol of a voltmeter along with a description.
	<i>Insert ammeter</i>	Inserts the symbol of an ammeter along with a description.
	<i>Generate material list</i>	Generates quantitative lists of materials used in the project.

Commands table

	<i>Generate material list for selected elements</i>	Generates quantitative lists of materials used in selected elements.
	<i>Insert front view</i>	Insert a real view of a box along with a description.
	<i>Insert box</i>	Inserts a new distribution board design.
	<i>Program option settings</i>	Enables the use of standard options for the entire project.
	<i>Show help</i>	Displays the help window.

9.11. ArCADia-TELECOMMUNICATIONS NETWORKS

The following options are described in the help file of the ArCADia-TELECOMMUNICATIONS NETWORKS, the icon is at the *Telecommunication* ribbon.

Tab. 31. Functions of ArCADia-TELECOMMUNICATIONS NETWORKS module from *Telecommunication* ribbon:

Icon	Option	Description
	<i>Insert cable chamber</i>	Inserts and edits the properties of a cable chamber along with its symbol and description
	<i>Insert cable container</i>	Inserts and edits the properties of a cable container along with its symbol and description
	<i>Insert outdoor cabinet</i>	Inserts and edits the properties of an outdoor cabinet along with its symbol and description
	<i>Insert pole</i>	Inserts and edits the properties of an overhead line pole along with its symbol and description
	<i>Inserts telecommunications distribution frame</i>	Inserts and edits the properties of a telecommunications distribution frame along with its symbol and description
	<i>Insert fibre optic distribution frame</i>	Inserts and edits the properties of a fibre optic distribution frame along with its symbol and description
	<i>Insert cable post</i>	Inserts and edits the properties of a cable post along with its symbol and description
	<i>Insert line terminal casing</i>	Inserts and edits the properties of a line terminal casing along with its symbol and description
	<i>Insert cable joint</i>	Inserts and edits the properties of a cable joint along with its symbol and description
	<i>Insert routing marker</i>	Inserts and edits the properties of a routing marker along with its symbol and description
	<i>Insert survey point</i>	Inserts and edits the properties of a survey point along with its symbol and

Commands table

	<i>Insert conduit</i>	Inserts and edits the properties of a conduit along with its symbol and description
	<i>Insert primary cable duct profile</i>	Inserts and edits the properties of a primary cable duct along with its symbol and description
	<i>Insert cable subway profile</i>	Inserts and edits the properties of a cable subway along with its symbol and description
	<i>Insert cable profile</i>	Inserts and edits the properties of a cable along with symbol its and description
	<i>Insert overhead cable line</i>	Inserts and edits the properties of an overhead cable line along with its symbol and description
	<i>Altitude change</i>	Changes the foundation altitude of an object used in the project
	<i>Change object status</i>	Changes the status of an object used in the project: <i>designed/existing</i>
	<i>Generate optical-fibre cable diagram</i>	Inserts and edits a selected diagram for the selected optical-fibre cable link designed in the project
	<i>Generate telecommunications cable diagram</i>	Inserts and edits a selected diagram for the selected telecommunications cable link designed in the project
	<i>Generate primary cable duct diagram</i>	Inserts and edits a selected diagram for the selected primary cable duct route segment designed in the project
	<i>Generate cable subway diagram</i>	Inserts and edits a selected diagram for the selected cable subway route segment designed in the project
	<i>Generates bill of materials</i>	Generates the bill of materials used in the project
	<i>Insert material list for selected elements</i>	Generates a quantitative material list for the elements selected in the projection
	<i>Element list</i>	Inserts the legend of symbols along with a description.
	<i>List of selected elements</i>	Inserts the legend of symbols along with a description of elements marked on the projection.
	<i>List of cable chambers</i>	Generates a list of cable chambers used in the project
	<i>List of primary cable duct segments</i>	Generates a table summarizing the primary cable duct segments used in the project
	<i>List of survey point coordinates</i>	Generates a table summarizing survey point coordinates for the objects used in the project and the points indicated
	<i>Description of optical-fibre cable</i>	Generates a table summarizing descriptions of the selected optical-fibre cable link
	<i>List of optical-fibre cable segments</i>	Generates a table summarizing the optical-fibre cable segments
	<i>Analysis of optical-fibre cable attenuation</i>	Generates a table in the form of a report with attenuation calculations for the selected optical-fibre cable

Commands table

	<i>Description of optical-fibre cable route</i>	Generates a table summarizing descriptions of the selected optical-fibre cable link
	<i>List of telecommunications cable segments</i>	Generates a table summarizing telecommunications cable segments
	<i>Attenuation and impedance analysis for cable paths</i>	Generates a table in the form of a report with attenuation and impedance calculations for the selected cable path
	<i>Telecommunications network inspection</i>	Enables the user to run standard checks of the designed network for the project
	<i>Program option settings</i>	Sets standard options for the whole project
	<i>Show help</i>	Displays the help window.

9.12. ArCADia-WATER SUPPLY INSTALLATIONS

The following options are described in the help file of the ArCADia-WATER SUPPLY INSTALLATIONS module, the icon is at the *Water* ribbon

Tab. 32. Functions of ArCADia-WATER SUPPLY INSTALLATIONS module from *Water* ribbon:

Icon	Option	Description
	<i>Insert installation connection point</i>	Inserts an installation connection point and allows to define installation and technical parameters of cold water supply necessary to perform the calculations further in the project.
	<i>Insert set of local installation connection points</i>	Inserts a connection point for a part of an installation and allows to define installation and technical parameters of cold water supply necessary to perform the calculations further in the project. Here you can change the purpose of a selected part of the building.
	<i>Insert water supply pipe set</i>	Inserts a water supply pipe set from the groups of any configuration and/or allows you to define the parameters for a given pipeline set and to choose pipelines insulation from this set.
	<i>Insert vertical water supply pipes set</i>	Inserts a vertical water supply pipe set from the groups of any configuration and/or allows you to define the parameters for a given pipeline set and to choose pipelines insulation from this set.
	<i>Insert water supply pipe – Cold water</i>	Inserts a water supply pipe from the Cold water group and/or allows you to define the parameters for a given pipeline and to choose cold water pipelines insulation.
	<i>Insert vertical water supply pipe - cold water</i>	Inserts a vertical water supply pipe from the Cold water group and/or allows you to define the parameters for a given pipeline and to choose cold water pipelines insulation.
	<i>Convert line into pipe - cold water</i>	Converts a line into a cold water pipe, at the active level

Commands table

	<i>Insert water supply pipe - hot water</i>	Inserts a water supply pipe from the Hot water group and/or allows you to define the parameters for a given pipeline and to choose hot water pipelines insulation.
	<i>vertical water supply pipe - hot water</i>	Inserts a vertical water supply pipe from the Hot water group and/or allows you to define the parameters for a given pipeline and to choose hot water pipelines insulation.
	<i>Convert line into pipe – hot water</i>	Converts a line into a hot water pipe, at the active level
	<i>Insert water supply pipe - circulation water</i>	Inserts a water supply pipe from the Circulating water group and/or allows you to define the parameters for a given pipeline and to choose circulating water pipelines insulation.
	<i>vertical water supply pipe - circulation water</i>	Inserts a vertical water supply pipe from the Circulating water group and/or allows you to define the parameters for a given pipeline and to choose circulating water pipelines insulation.
	<i>Convert line into pipe – circulation</i>	Converts a line into a circulating water pipe, at the active level.
	<i>Insert faucet</i>	Inserts a draw-off faucet and allows you to select and/or define the characteristic faucet parameters.
	<i>Insert draw-off tap</i>	Inserts a draw-off tap and allows you to select and/or define the characteristic tap parameters.
	<i>Insert hydrant</i>	Inserts a hydrant and allows you to select and/or define the characteristic hydrant parameters, i.e. e.g. a hydrant cabinet.
	<i>Insert shut-off valve</i>	Inserts a shut-off valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert non-return valve</i>	Inserts a non-return valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert control valve</i>	Inserts a control valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert pressure reducing valve</i>	Inserts a pressure reducing valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert balancing valve</i>	Inserts a balancing valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert safety valve</i>	Inserts a safety valve and allows you to select and/or define the characteristic valve parameters.
	<i>Insert water meter</i>	Inserts a water meter and allows you to select and/or define the characteristic water meter parameters.
	<i>Insert manometer</i>	Inserts a manometer and allows you to select and/or define the characteristic manometer parameters.
	<i>Insert hot water preparation device</i>	Inserts a hot water preparation device and allows you to select and/or define the parameters characteristic for the device, e.g. exchanger.
	<i>Insert heater</i>	Inserts a heater and allows you to select and/or define the characteristic heater parameters.
	<i>Insert central water mixer</i>	Inserts a central water mixer and allows you to select and/or define the characteristic mixer parameters.
	<i>Insert pump</i>	Inserts a pump and allows you to select and/or define the characteristic pump parameters.

Commands table

	<i>Insert pressure booster</i>	Inserts a pressure booster and allows you to select and/or define the characteristic pressure booster parameters.
	<i>Insert filter</i>	Inserts a filter and allows you to select and/or define the characteristic filter parameters.
	<i>Connection wizard</i>	Automatically inserts connections with water outlets in three ways.
	<i>Change installation height</i>	Moves water-supply installation vertically by a given value.
	<i>Automatically insert moulds</i>	Inserts pipeline moulds according to the project settings.
	<i>Insert axonometry of entire installation</i>	Inserts the axonometry of the water-supply installation.
	<i>Insert axonometry of installation branches</i>	Inserts the axonometry of installation sections (branches).
	<i>Insert material list</i>	Inserts material list, allows you to export the drawing to RTF file and Ceninwest.
	<i>List of materials of selected elements</i>	Inserts the list of selected materials and enables its export to RTF and Ceninwest.
	<i>Insert item list</i>	Inserts an item list with symbols used on the projection (drawing key).
	<i>List of selected elements</i>	Inserts the list of selected elements along with symbols applied on the projection (drawing legend).
	<i>Perform a selection of system components</i>	Displays a window with options for selection and allows to perform an automatic selection.
	<i>Calculations and report for water supply system</i>	Displays the calculation of the water supply window: cold water, hot water and circulation.
	<i>Water supply system verification</i>	Displays a window with installation verification, possible errors, information and warnings.
	<i>Options</i>	Display the options window
	<i>Show help</i>	Displays Help file.

9.13. ArCADia-SEWAGE INSTALLATIONS

The following options are described in the help file of the ArCADia-SEWAGE INSTALLATIONS module, the icon is at the *Sewer* ribbon

Tab. 33. Functions of ArCADia-SEWAGE INSTALLATIONS module from *Sewer* ribbon:

Icon	Option	Description
	<i>Insert outflow point for a sewage line</i>	Enables defining the waste water outflow site, type of sewage line based on the type of waste water and the relative drain location altitude.

Commands table

	<i>Insert internal sewage pipe*</i>	<i>Inserts a pipeline section with the option to determine relative altitudes and determine the function for the pipeline.</i>
	<i>Insert internal sewage pipe with a continuous route</i>	<i>Inserts a set of sewage pipes with descriptions</i>
	<i>Insert vertical internal sewage pipe</i>	<i>Enables inserting a vertical pipe section with a particular function (defining a stack) and defining the parameters</i>
	<i>Insert connection and inspection well</i>	<i>Inserts the connection well item with a description and parameters</i>
	<i>Insert outflow point for a sanitary fixture</i>	<i>Defines the sewage outflow from a sanitary fixture into the sewage installation pipes, especially the location, installation height, diameter.</i>
	<i>Insert inside drain</i>	<i>Inserts an inside drain in the rainwater pipeline</i>
	<i>Insert outlet pipeline fitting</i>	<i>Inserts stop and shut-off fittings (e.g. backwater valve) along with a description, parameters and housing</i>
	<i>Insert cleanout</i>	<i>Inserts the cleanout item along with a description and parameters</i>
	<i>Insert inspection opening</i>	<i>Inserts an inspection opening along with description, parameters and housing, with the option to select a pipeline</i>
	<i>Insert vent</i>	<i>Inserts a vent in the sewage stack in the form of a soil vent or a vacuum relief valve</i>
	<i>Inserting branch lines for sanitary fixtures</i>	<i>Enables defining group branch lines from a stack to sanitary fixtures. Activates the branch lines organization configurator.</i>
	<i>Change installation height</i>	<i>Enables changing the height of a sewage installation item group by the selected value</i>
	<i>Insert sewage installation extension</i>	<i>Enables generating an extension of the internal sewage installation</i>
	<i>Insert sewage installation branch extension</i>	<i>Enables generating an extension of the selected sewage installation part</i>
	<i>Insert sewage profile</i>	<i>Enables generating a profile for the internal sewage outlets</i>
	<i>Create an internal sewage profile</i>	<i>Enables defining the organisation of side profiles from the main profile</i>
	<i>Insert material list</i>	<i>Inserts a material lists table into the drawing</i>
	<i>Insert material list from selected elements</i>	<i>Insert material list from installation elements selected on the projection</i>
	<i>Insert item list</i>	<i>Inserts an item list of the sewage installation along with the graphical symbols, names, markings and quantity</i>
	<i>Insert selected elements list</i>	<i>Inserts the list of the installation elements selected on the projection</i>
	<i>Determine diameters of outlet lines</i>	<i>Displays the calculation tables and generates a report presenting the technical calculations and the validity of the designed sewage installation of outlet pipelines. Generates calculation reports.</i>

Commands table

	<i>Sewage installation verification</i>	<i>Generates a list of items that have been designed with errors. Identifies pipe sections with the wrong functions in the sewage line</i>
	<i>Selection of sewage stacks</i>	<i>Enables the designer to easily verify whether sewage stacks were correctly selected. Generates calculation reports.</i>
	<i>Project options</i>	<i>Displays project options</i>
	<i>Show help</i>	<i>Displays the software help contents</i>

9.14. ArCADia-SEWAGE SYSTEMS

The following options are described in the help file of the ArCADia-SEWAGE SYSTEMS, the icon is at the *Sewer* ribbon.

Tab. 34. Functions of ArCADia-SEWAGE SYSTEMS module from *Sewer* ribbon:

Icon	Option	Description
	<i>Storm water drainage system</i>	Drawing storm water drainage system by indication of the point and selection of the element.
	<i>Sanitary network</i>	Drawing sanitary drainage by indication of the point and selection of the element.
	<i>Insert collisions</i>	Inserting collisions/utilities.
	<i>Elevation points</i>	Inserts elevation points of the area.
	<i>Help</i>	Displays the content of the help file for the software.

9.15. ArCADia-GAS INSTALLATIONS

The following options are described in the help file of the ArCADia-GAS INSTALLATIONS module, the icon is at the *Gas* ribbon.

Tab. 35. Functions of ArCADia-GAS INSTALLATIONS module from *Gas* ribbon:

Icon	Option	Description
	<i>Inserts gas box</i>	Inserts a gas box along with a description
	<i>Insert gas appliance</i>	Inserts a gas appliance along with a description
	<i>Insert gas meter</i>	Inserts a gas meter along with a description
	<i>Insert gas valve</i>	Inserts a gas valve along with a description
	<i>Insert filter</i>	Inserts a gas filter along with a description

Commands table

	<i>Insert gas reducer</i>	Inserts a gas reducer along with a description
	<i>Inserts gas pipe</i>	Inserts a gas pipe along with a description
	<i>Insert gas pipe with continuous route</i>	Inserts a section of gas pipes along with a description
	<i>Insert vertical gas pipe</i>	Inserts a vertical gas pipe along with a description
	<i>Change line into a gas pipe</i>	The CAD command line inserted (dash) will be changed into a gas pipe with the given parameters
	<i>Change installation height</i>	Enables changing the height of a group of objects of a gas installation
	<i>Fittings</i>	Inserts gas fittings in accordance with settings in the project options.
	<i>Gas installation extension</i>	Generates a gas installation extension
	<i>Installation branch extension</i>	Generates a gas installation branch extension
	<i>Gas installation axonometry</i>	Generates a gas installation axonometry
	<i>Gas installation branch axonometry</i>	Generates a gas installation branch extension
	<i>Insert material list*</i>	Inserts a material lists table into the drawing
	<i>Insert material list from selected elements*</i>	Inserts a user defined material lists table into the drawing
	<i>Insert item list</i>	Inserts a gas installation item list along with graphical symbols, names, markings and quantity
	<i>Selected items list</i>	Inserts a user defined gas item list along with graphical symbols, names, markings and quantity
	<i>Selection of installation elements</i>	Allows for automatic selection of gas installation elements
	<i>Gas installation calculations and report*</i>	Displays the calculation tables and generates a report presenting the technical calculations and the validity of the designed network
	<i>Gas installation verification</i>	Generates a list of erroneously designed elements
	<i>Options</i>	Displays the options window
	<i>Help*</i>	Displays the help window

Commands table

9.16. ArCADia-EXTERNAL GAS INSTALLATIONS

The following options are described in the help file of the ArCADia-EXTERNAL GAS INSTALLATIONS module, the icon is at the *Gas* ribbon.

Tab. 36. Functions of ArCADia-EXTERNAL GAS INSTALLATIONS module from *Gas* ribbon:

Icon	Option	Description
	<i>Insert connection point</i>	It allows the user to define the parameters for inserting the designed pipeline to the gas source (gas pipeline)
	<i>Insert outdoor gas box</i>	Inserts a gas cabinet along with a description and parameters
	<i>Insert outdoor gas valve</i>	Inserts a gas cabinet along with a description and parameters
	<i>Insert outdoor gas pipe*</i>	Inserts a gas pipe along with a description and parameters
	<i>Insert outdoor vertical gas pipe</i>	Inserts a vertical gas pipe along with a description and parameters
	<i>Change line into a gas pipe</i>	The CAD command line inserted (dash) will be changed into a gas pipe with the given parameters
	<i>Insert horizontal casing pipe</i>	Inserts a casing pipe onto a non vertical gas pipeline and defined the parameters
	<i>Vertical casing pipe</i>	Inserts a casing pipe onto a vertical gas pipeline and defined the parameters
--	<i>Insert survey point</i>	Inserts a survey point providing information concerning coordinates of any element
	<i>Change network elevation</i>	Allows to change the vertical location of all selected elements
	<i>Outdoor gas installation profile</i>	Generates outdoor gas installation profile
	<i>Generate a material list*</i>	Generates quantitative lists of materials used in the project.
	<i>Insert material list from selected elements*</i>	Inserts a user defined material lists table into the drawing
	<i>Generates an element list</i>	Generates a quantitative list of elements used in the project along with their markings (legend)
	<i>Insert selected elements list</i>	Generates a quantitative list of the elements selected by the user
	<i>Outdoor gas installation calculations and report*</i>	Displays the calculation tables and generates a report presenting the technical calculations and the validity of the designed installation
	<i>Gas installation verification</i>	Generates a list of erroneously designed elements
	<i>Generate coordinates</i>	Creates a list of survey point coordinates in the RTF format.

Commands table

	<i>Project options</i>	<i>Displays a project settings dialog box.</i>
	<i>Help*</i>	<i>Displays the help window. (Help is located on the left side of the ArCADia software menu)</i>

9.17. ArCADia-REINFORCED CONCRETE SLAB

The following options are described in the help file of the ArCADia-REINFORCED CONCRETE SLAB module, the icon is at the *Construction* ribbon.

Tab. 37. Functions of the ArCADia-REINFORCED CONCRETE SLAB module

Icon	Option	Description
	<i>Insert slab</i>	Inserts a slab contour of customized shape
	<i>Insert rectangular slab</i>	Inserts a rectangular slab contour
	<i>Insert slab from XML file</i>	Inserts slab geometry from ArCADia-ARCHITECTURE software XML file
	<i>Insert wall</i>	Inserts a slab support in the form of a wall
	<i>Inserts binder</i>	Inserts a slab support in the form of a binder
	<i>Insert column</i>	Inserts a slab support in the form of a column
	<i>Insert opening</i>	Inserts an opening into the slab
	<i>Insert rebar</i>	Inserts a customized bar into the slab
	<i>Insert mesh</i>	Inserts a reinforcing mesh of customized shape
	<i>Insert mesh automatically</i>	Inserts a reinforcing mesh on the entire area of the slab
	<i>Insert mesh opening</i>	Inserts an opening into the reinforcing mesh
	<i>Mesh ratio</i>	Inserts a concentration into the reinforcing mesh
	<i>Insert rebar details</i>	Inserts details for a single bar
	<i>Insert all rebar details</i>	Inserts all the details of the bars
	<i>Insert space rebar details</i>	Inserts the details of a spacer bar (high chair)
	<i>Insert rebars description</i>	Inserts a description of the bars
	<i>Insert Aggregated rebars description</i>	Inserts a description of the aggregated bars
	<i>Insert dimension</i>	Inserts any dimension

Commands table

	<i>Insert steel list</i>	Inserts a project steel list
	<i>Insert item steel list</i>	Inserts a steel list for a single slab
	<i>Insert cross-section</i>	Inserts a cross-section of the slab
	<i>Insert bottom view</i>	Inserts a bottom reinforcement view of the slab
	<i>Insert top view</i>	Inserts a top reinforcement view of the slab
	<i>Activate</i>	Activates the indicated construction view
	<i>Help</i>	Displays the help window

9.18. ArCADia-REINFORCED CONCRETE COLUMN

The following options are described in the help file of the ArCADia-REINFORCED CONCRETE COLUMN module, the icon is at the *Construction* ribbon.

Tab. 38. Functions of the ArCADia-REINFORCED CONCRETE COLUMN module

Icon	Option	Description
	<i>Insert column</i>	Inserts column
	<i>Insert complete column from xml file</i>	Inserts complete column from xml file
	<i>Insert column from upper level</i>	Inserts column of upper level
	<i>Insert transom</i>	Inserts transom
	<i>Insert stirrup block</i>	Inserts stirrup block
	<i>Insert single stirrup</i>	Inserts single stirrup
	<i>Insert automatic rebar block</i>	Inserts automatic rebar block
	<i>Insert single automatic rebar</i>	Inserts single automatic rebar
	<i>Insert user-defined rebar shape</i>	Inserts user-defined rebar shape
	<i>Insert rebar details</i>	Inserts rebar detail
	<i>Insert all rebar details</i>	Inserts details for all rebars
	<i>Insert rebars description</i>	Inserts rebar descriptions
	<i>Insert dimension</i>	Inserts freely chosen dimension

Commands table

	<i>Insert steel list</i>	Inserts list of steels used in the project
	<i>Insert item steel list</i>	Inserts list of steels used in the structural element
	<i>Insert front view</i>	Inserts front view
	<i>Insert rear view</i>	Inserts rear view
	<i>Insert left-side view</i>	Inserts left-side view
	<i>Insert right-side view</i>	Inserts right-side view
	<i>Insert section</i>	Insert section
	<i>Activate</i>	Activates selected construction view
	<i>Help</i>	Displays the help window

9.19. ArCADia-SURVEYOR

The following options are described in the help file of the ArCADia-SURVEYOR module, the icon is at the *Inventory control* ribbon.

Tab. 39. Functions of ArCADia-SURVEYOR module from *Inventory control* ribbon:

Icon	Option	Description
	Turn on rangefinder	Turns on rangefinder operation.
	Turn off rangefinder	Turns off rangefinder operation.
	Navigator	Opens window which displays the most important options necessary to make a drawing using the rangefinder.
	Move/Join a group of rooms	Enables moving the selected room or a group of rooms to be joined with other rooms.
	Rotate a group of rooms by 90o left	Rotates a room or group of rooms by 90o to the left.
	Rotate a group of rooms by 90o right	Rotates a room or group of rooms by 90o to the right.
	Rotate group of rooms by any angle	Rotates a room or group of rooms by any angle.
	Show help	Displays the help window.