Krzysztof Ruszyński

Izabela Cholewa

Dariusz Matuszek

ZWMetric

ZWMetric 2021

Wersja 2021.0.00. (06-08-2020)

All rights reserved including the right of reproduction in whole or in part in any form. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without prior permission from Usługi Informatyczne SZANSA Sp. z o.o.

All signs found in the text are trademarks or registered trademarks of their respective owners. Usługi Informatyczne SZANSA Sp. z o.o. has made its best effort to deliver complete and reliable information within this manual.

The firm shall not be held liable for the usage, or for any potential breach of patent or copyrights included within the manual.

Usługi Informatyczne SZANSA Sp. z o.o. may in no way be held responsible for damage that may occur as a result of and/or when using the information found within the manual.

Usługi Informatyczne SZANSA Sp. z o.o.

ul. Chryzantemowa 5

43-300 Bielsko-Biała

NIP 9372672769

www.zwcad.pl

tel. +48 33 307 01 95

Copyright © Usługi Informatyczne SZANSA Gabriela Ciszyńska - Matuszek

Table of contents

Table of contents 2
1 Introduction 4
2 Quick start 5
2.1 Area measurement 5
2.2 Area measurement 7
2.3 Quick measurement without naming the description 8
2.4 Measurement by indicating the area inside 9
2.5 Line measurement 10
2.6 Finding objects 11
2.7 Example No. 1 – area measurement in a raster image 12
2.8 Example No. 2 – Creating inventory and drawing of rooms 12
3 Defined commands 14
3.1 Area measurement 15
3.2 Area Outline 17
3.3 Area Marking 22
3.4 Area By Point 22
3.5 Line Measurement 24
3.6 Mark Objects 25
3.7 Find 26
3.8 Select 26
3.9 Draw a triangle by specyfing distances of sides 27
3.10 Draw a triangle by specyfing an angle and length of two sides 28
3.11 Sum of length 29
3.12 Mdist 29

3.13 Report 29
3.14 Settings 31
3.15 ZWMetric:LL 31
3.16 ZWMetric:DD 32
4 Description Window 32
5 Additional information 35
5.1 Description filtering 35
5.2 Description window size 35
5.3 Description within the drawing is too small or too large 36
5.4 Change description appearance 36
5.5 Loading the application manually 37
6 Tips for working with ZWCAD 38
6.1 Quick select (qselect) 38
6.2 Polyline Edit (pedit) 38
6.3 Boundary (_boundary) 39
6.4 File compare (_fcmp) 39
6.5 Changing the appearance of the description 40

1 Introduction

ZWMetric consist of extra tools to measure area and linear area which are useful for cost planners, designers and architects.

Functionality can be described in the following way:

Drawing

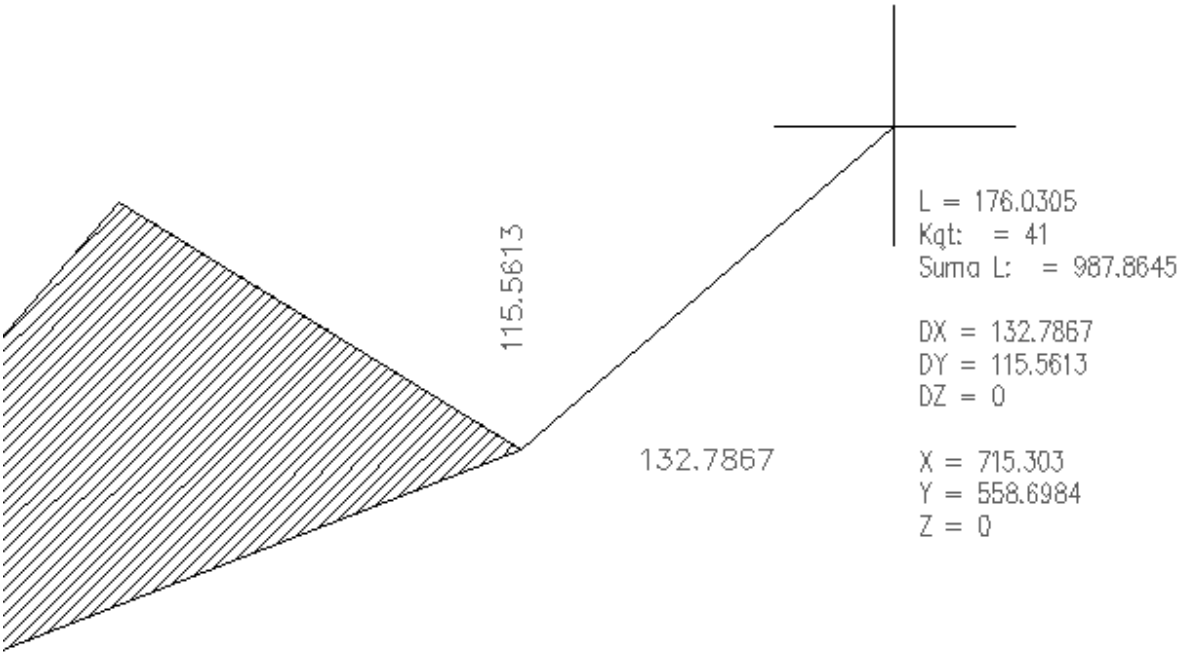
Measuring

Marking

Tables

Once ZWCAD is launched and ZWMetric installed, the following functions will become available:

The program is compatible with ZWCAD 2021 Professional.

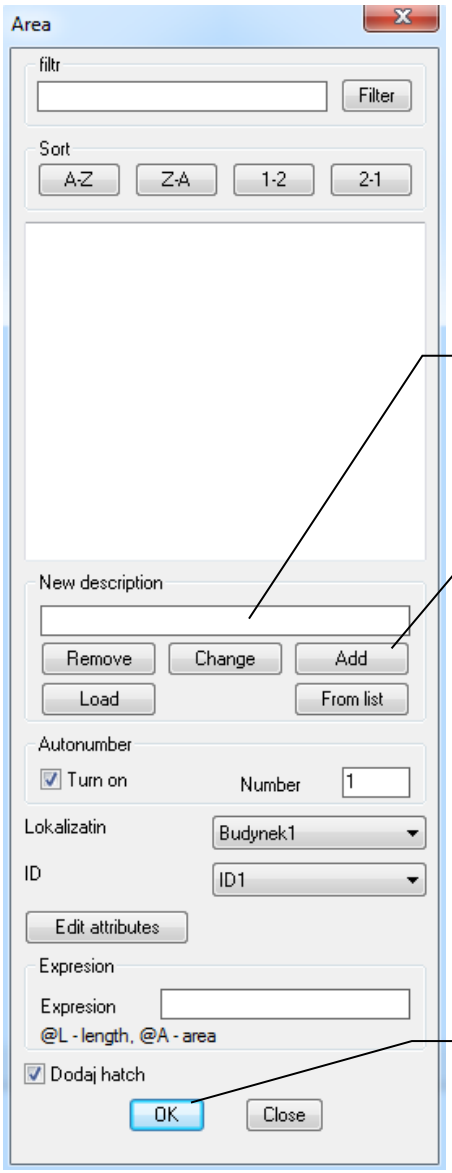


2 Quick start

In this chapter we will talk about a few Basic functions to mark and measure.

2.1 Area measurement

Area measurement is used to add markings to measured areas, it also includes a variety of extra functions. At first, it is enough to just enter a description.



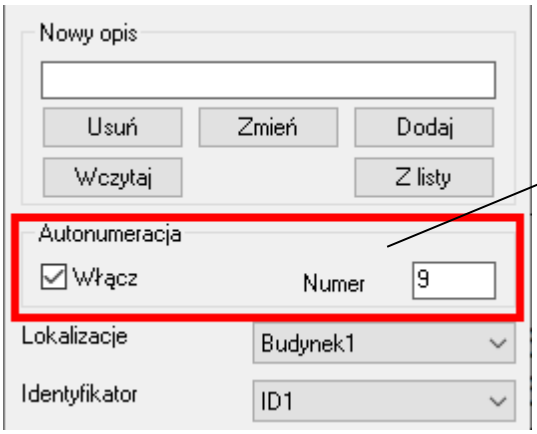
Step 1. Enter a description of a measured object, e.g. „Warehouse”.

Step 2. Click on „Add”. The description will be added to the list

Step 3. Click OK, the window will close and the results will be displayed.

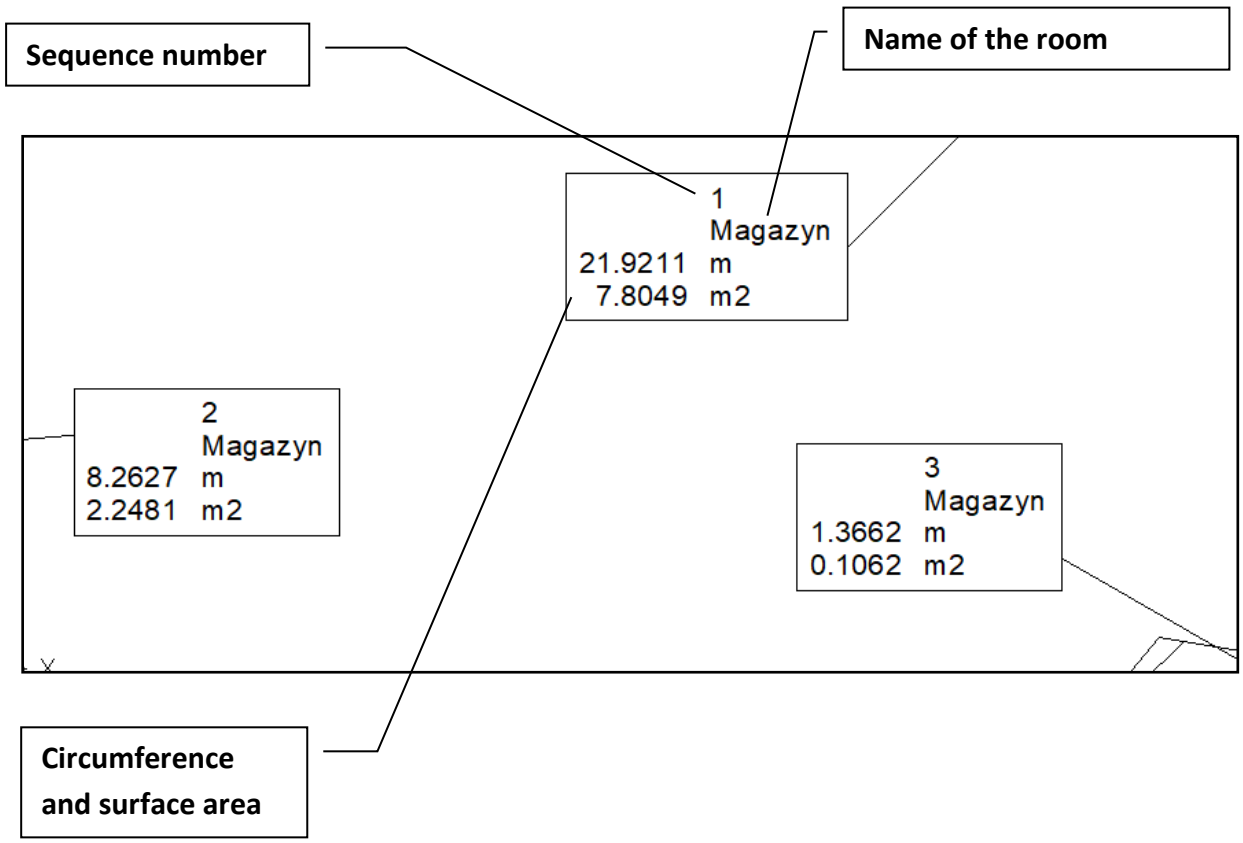
See how it works on youtube: https://youtu.be/iKTBUukmI6w, or by scanning the QR code.

You can have multiple rooms with the same name in one drawing. If autonumeration is enabled, each subsequent room will be assigned successive numbers.



Auto numeration. Each room will be assigned a unique sequential number.

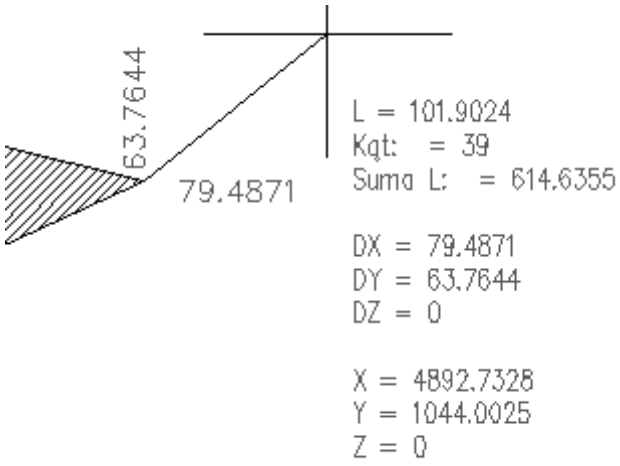
For example, in the drawing there are 3 rooms called „Warehouse”, the next labels of the rooms will look like in the figure below.



2.2 Area measurement

The command allows you to measure the surface and displays the **results in real time** next to the cursor. The results include:

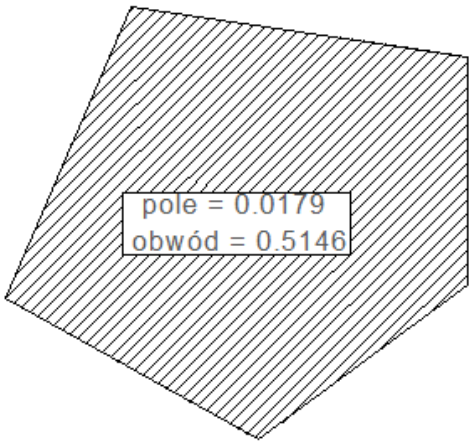
- L – Length
- Angle – angle
- L sum – sum of the lengths from the starting point
- DY, DY, DZ – the increment of the last section in 3 axes.
- X, Y, Z – coordinates X, Y, Z.



See how it works on youtube: https://youtu.be/s48tvoth_qg, or by scanning the QR code.

2.3 Quick measurement without naming the description

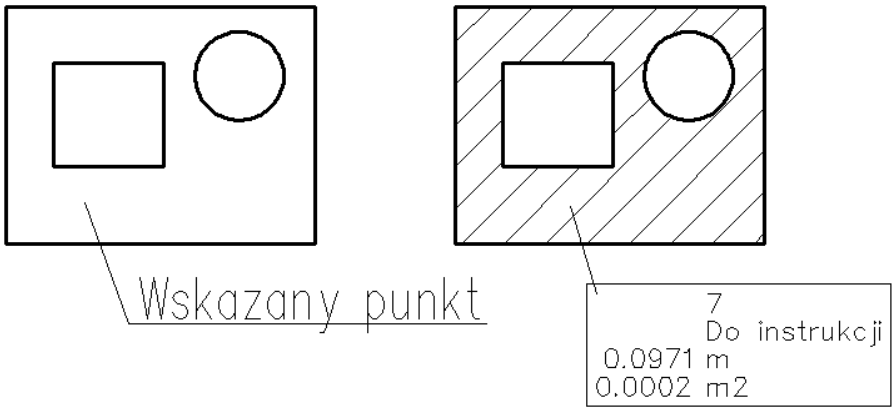
With this function, you can quickly **measure the perimeter and surface area of the selected area.** The results of the measurements will look like this:



See how it works on youtube: https://youtu.be/m2lnA_aAnwA, or by scanning the QR code.

2.4 Measurement by indicating the area inside

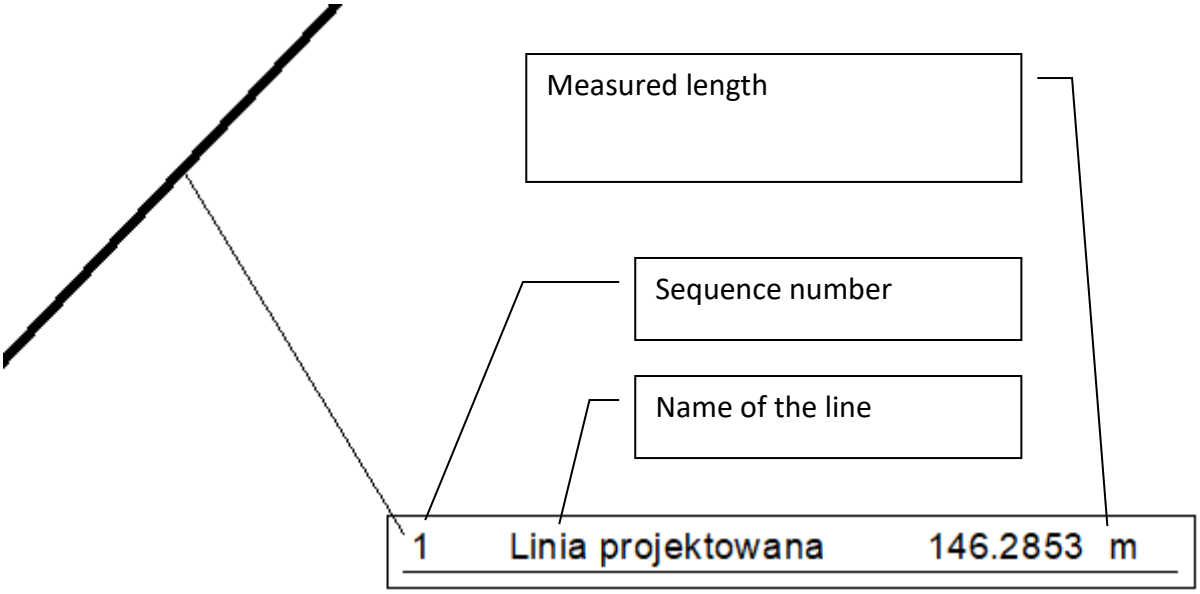
The tool allows you to mark and measure by indicating an internal point



See how it works on youtube: https://youtu.be/S3j7k8p96LU, or by scanning the QR code.

2.5 Line measurement

When you select the Line Measurement function, we indicate linear objects. Their total length will be measured and inserted into the external reference with the name and sequence number.



See it on youtube: https://youtu.be/m676SsZ8cOI, or by scanning the QR code with your phone!

This video also show how to create a table with information based on the drawing.

2.6 Finding objects

Thanks to the marking of measured areas, we can easily search for individual objects. After calling the function, a window with a list will open.

A list of objects marked within a drawing.

After selecting the desired item and using the „Find" button, ZWCAD will set the desired area in the drawing so that it is displayed Fuldy on the screen.

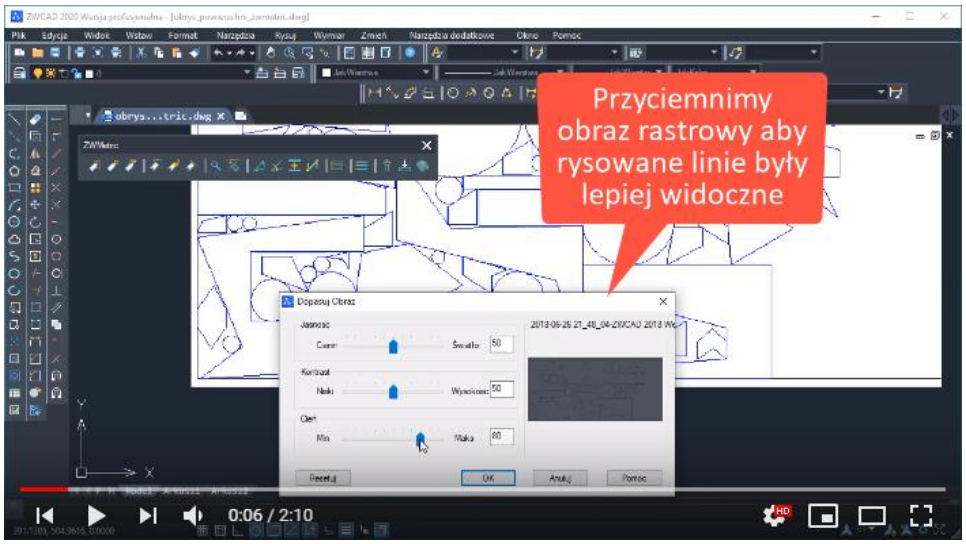
If there are more than one areas with the same name, we can jump from one to another by using SPACE on the keyboard.

See it on youtube: https://youtu.be/mw56iCZEJHE, or by scanning the QR code.

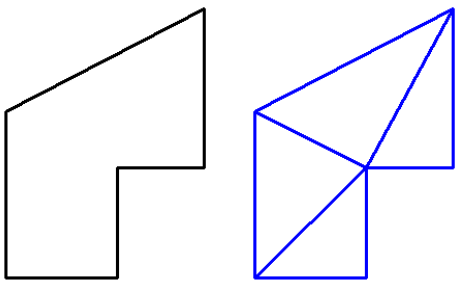
2.7 Example No. 1 – area measurement in a raster image

We have received a raster image and would like to measure the area. The whole operation is shown in the video.

See it on youtube: https://youtu.be/XOLQtaVwyPs, or by scanning the QR code.



2.8 Example No. 2 – Creating inventory and drawing of rooms



We have obtained the results of the inventory of rooms where the measurements were made using the triangular method.

An example of such function is available on our website: https://www.zwcad.pl/wyszukiwanie-w-bazie-wiedzy/46-zagadnienia-konstrukcyjne/761-inwentaryzacja-i-rysowanie-pomieszczen.html

You can also scan the QR code with your phone to see the example on our website.

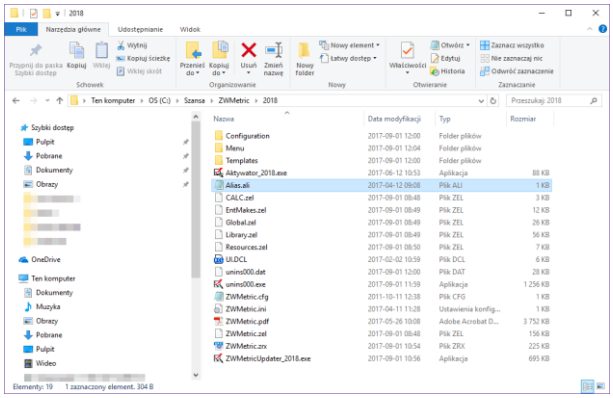
Detailed User Manual

3 Defined commands

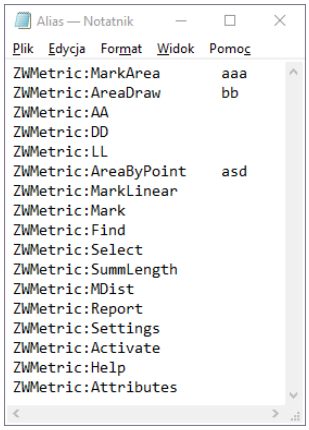
Custom function names (abbreviations):

ZWMetric allows you to customize the shortcuts for functions within the addon.

The Alias.ali file which can be edited by the user as needed, is located in the default directory: `C:\Szansa\ZWMetric\2021`



You can run the file using Notepad and enter your own shortcut names.

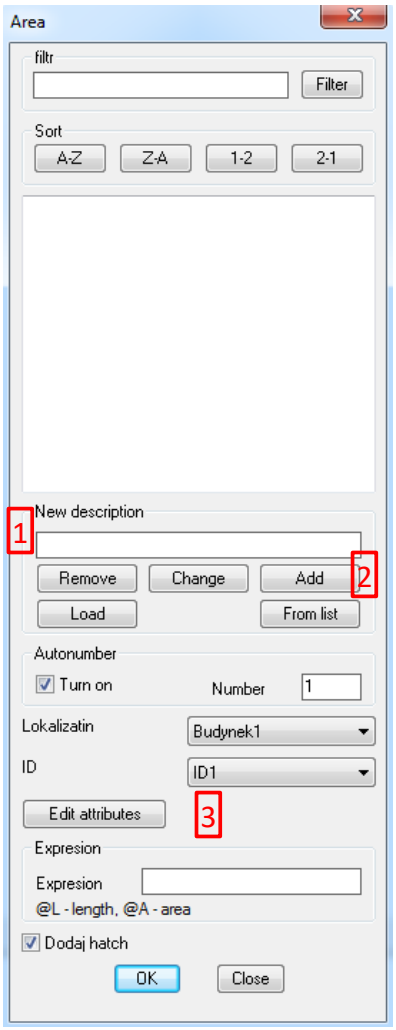


After introducing changes and saving the file, the user shall be able to use the newly introduced abbreviations by entering them in ZWCAD.

3.1 Area measurement

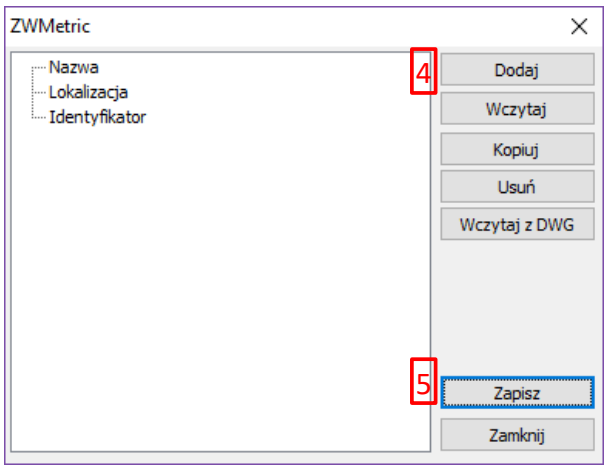
Command: `ZWMetric:MarkArea`

This command lets you mark an area in a drawing. In the window below, it is possible to add a description as well as additional settings.



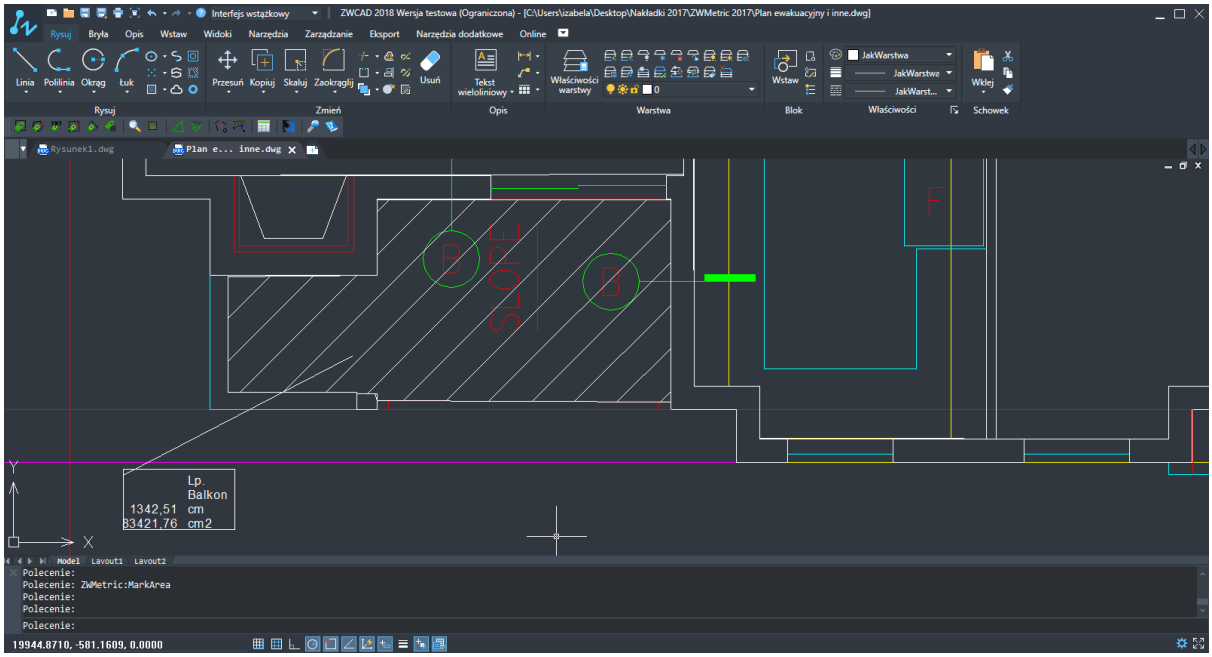
After activating the function, enter New description [1] by entering it and clicking on Add [2].

Then please enter the type of Location and the identifier by clicking on Edit attributes [3]. A window will appear in which you should expand the given tab and after click Add [4] enter the name of the Location and the name of the Identifier. After entering, click Save [5].

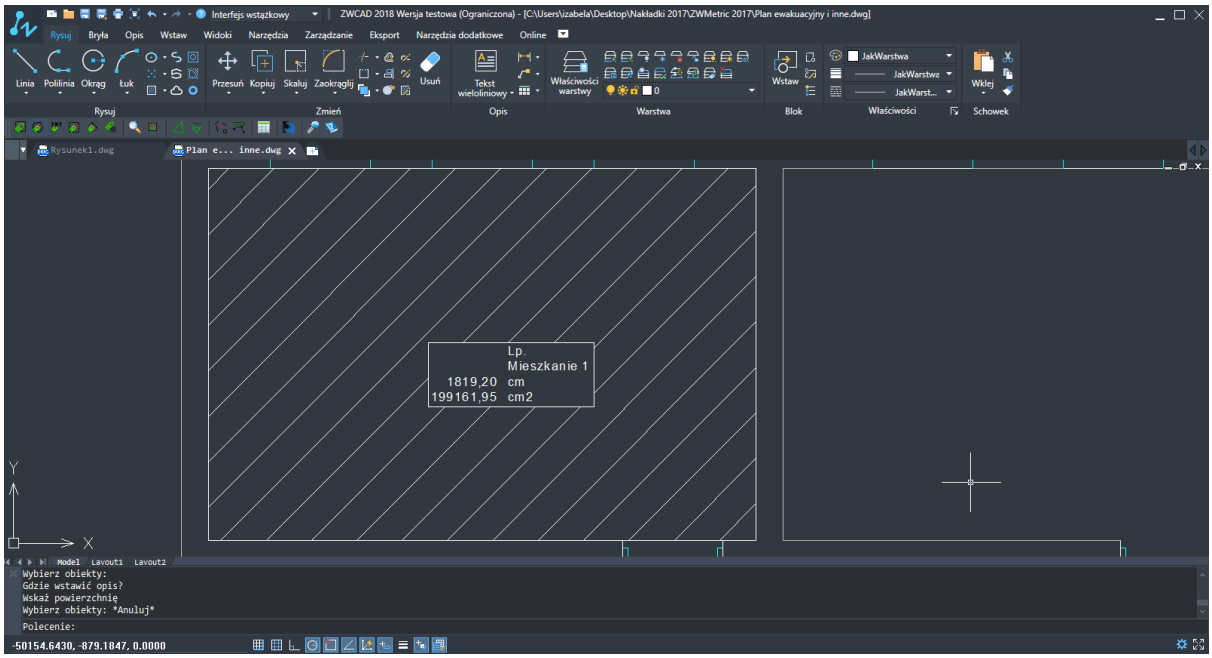


Then the program will ask the user to indicate the external out lines of the measured surface. In the next step, it will ask you to indicate the area to be excluded from the calculation. These outlines must be polyline objects.

The user will then be asked to draw a descriptive line, at the end of which a descriptive block will be inserted containing the description selected in the window, the numerical value of the surface of the selected area, the length of its perimeter and if so specified in the settings, as well as the attributes: location, identifier and name. If the appropriate box is selected in the window, a hatch inside the external surface outline will also be added to the drawing.



Opis możemy również wstawić bez linii opisowej przez bezpośrednie wskazanie jego położenia i zakończenie polecenia przez Escape na klawiaturze.



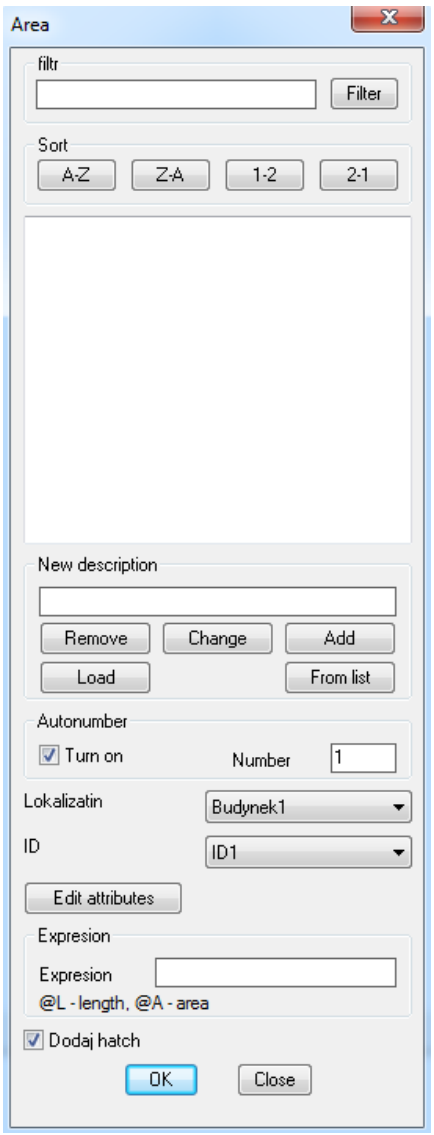
Parametry opisu i jego tła dostępne są w Ustawieniach.

3.2 Area Outline

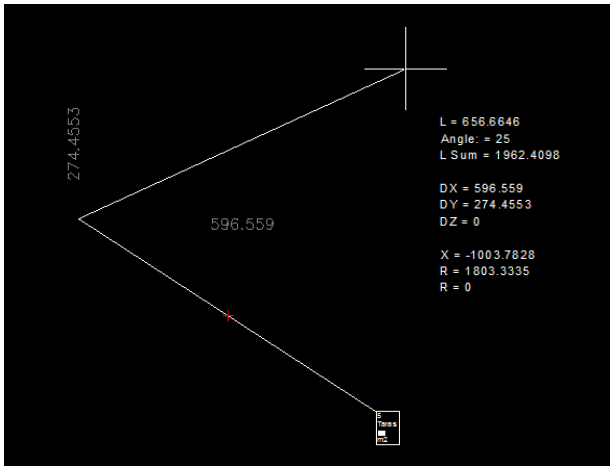
Command: `ZWMetric:AreaDraw`

This command is used to draw an area by clicking on points of an object. Once completed, an area with hatching and a text block will appear.

Once turned on, the program will ask for the name of an area as well as localization and hatching parameters.



The parameters that were entered need to be confirmed by clicking OK. Afterwards specify the points.



Data will appear next to the cursor:

L – Length

Kąt – angle

Sum L – Length sum from starting

DY – raise in the Y axis

DX – raise in the X axis

DZ – raise in the Z axis

X - coordinate X

Y – coordinate Y

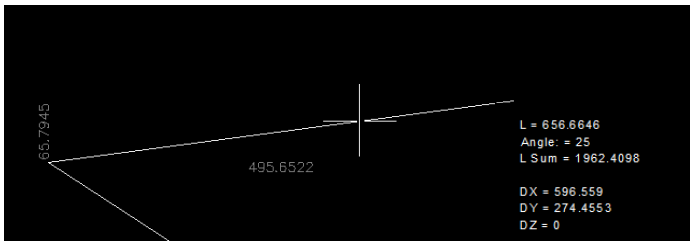
Z – coordinate Z

In the vertical and horizontal line, after X and Y axis, you can see the length.

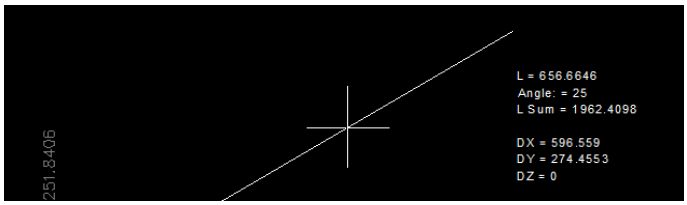
In the command bar you can see the elements that can be selected by using an appropriate shortcut. A value can be added to each and every available setting.

```
Specify the next point or
[Length/Angle/X/Y/MX/MY/Arc/Back/Type/Close/Settings]:<Length>
```

Length is set as the default parameter. It is possible to add more values by entering them afterwards.

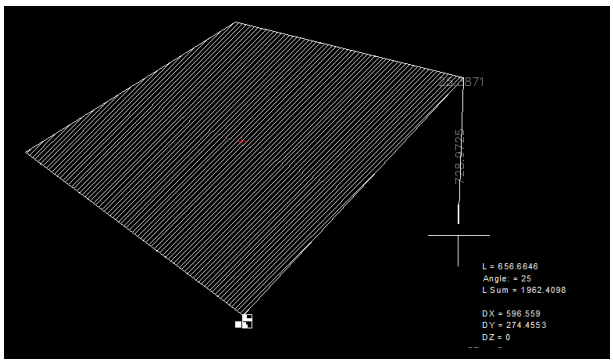


Until an angle has been added, the line with set length can be moved.



Once an angle has been added, the line will no longer follow the cursor.

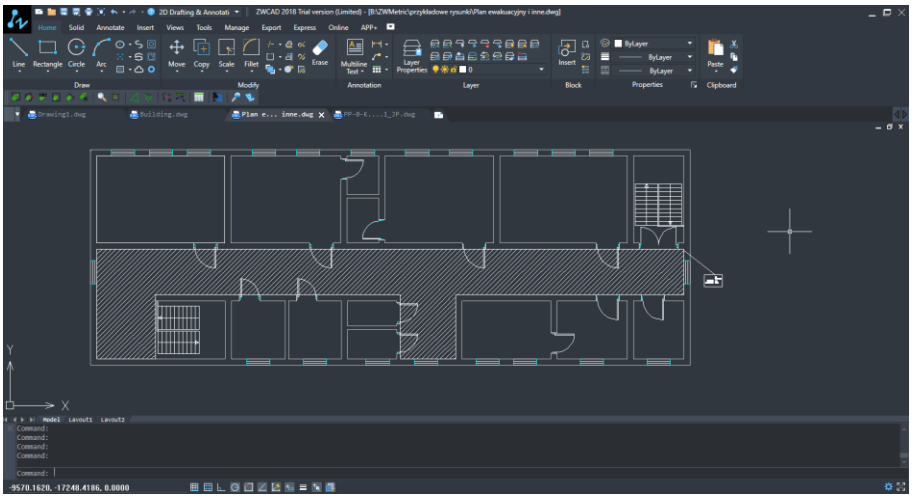
When hatching of an area is active, it will be displayed in following areas when clicked on.



The block will be visible in the starting point of an area.

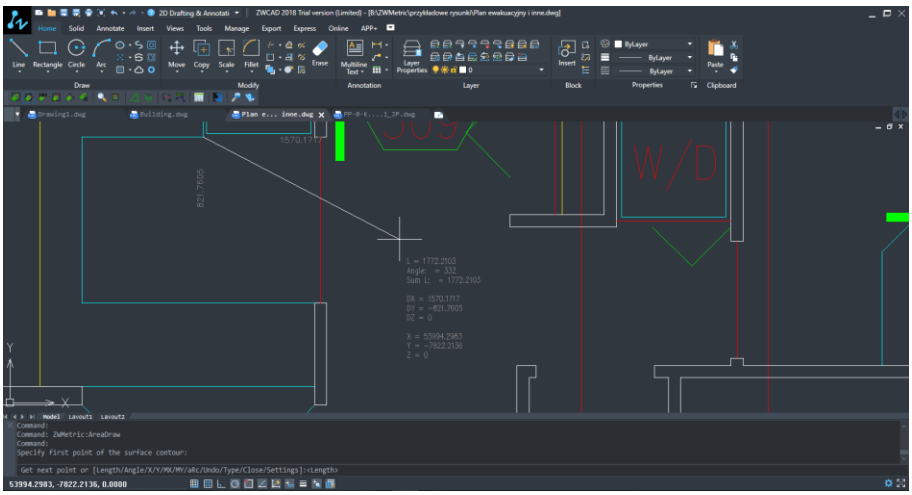
If the target area is selected, it is necessary to confirm by pressing Enter. Once confirmed, specify following points on the description line. Once finished press Escape.

By using this command we can check defined parameters of areas that are not regular shapes.

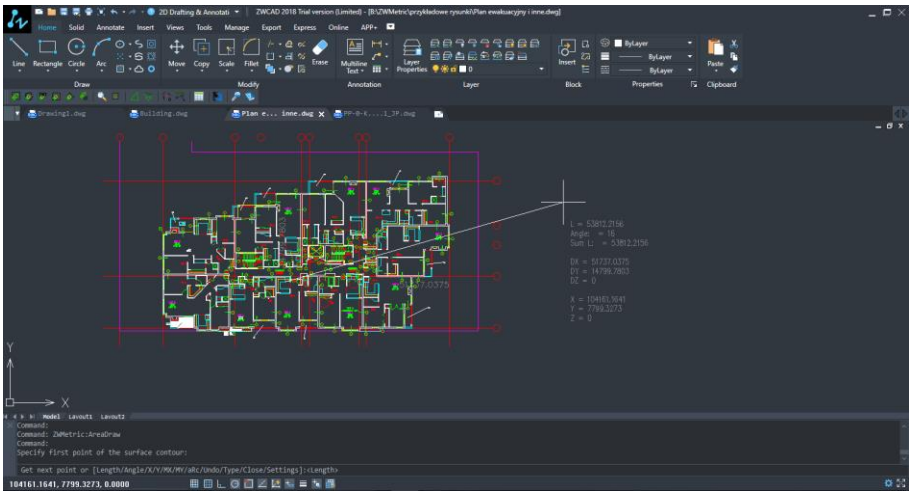


When using the function Area Outline parameters visible next to the cursor that can be used will adjust to the view that we are working on.

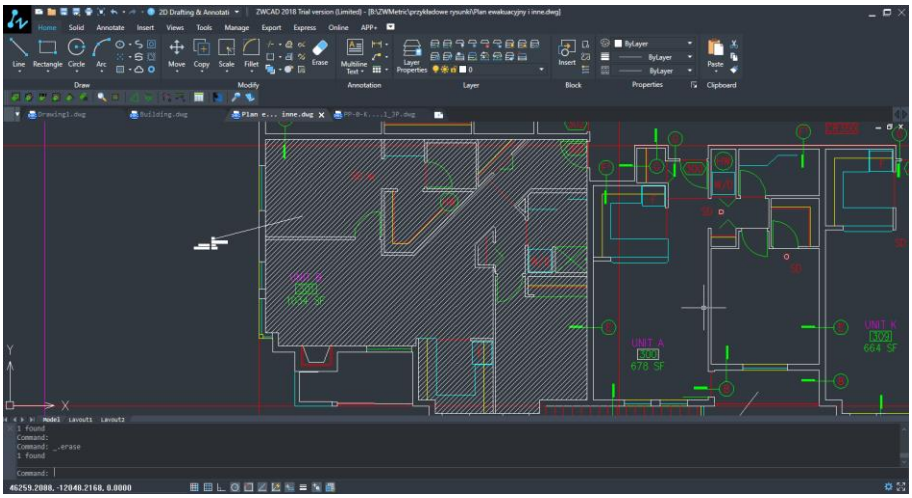
By zooming in, the the description will be adjusted accordingly.



When zooming out, the view will be maximized accordingly.



End result of Area Outline displayed on a drawing of a flat with irregular shapes:



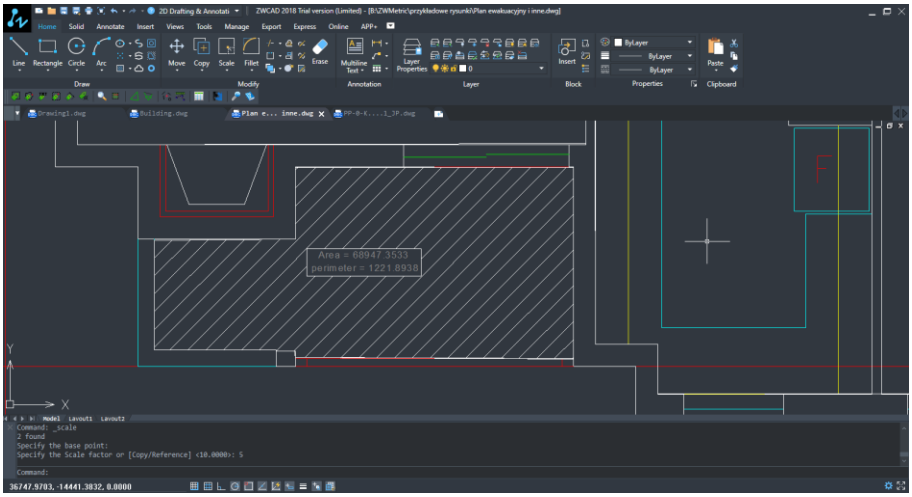
3.3 Area Marking

Command: `ZWMetric:AA`

The function allows you to input an area value in a description block defined on an area by points.

The area should be selected in the same way as in the previous function.

Once finished, confirm by Enter and specify next points of the description line.



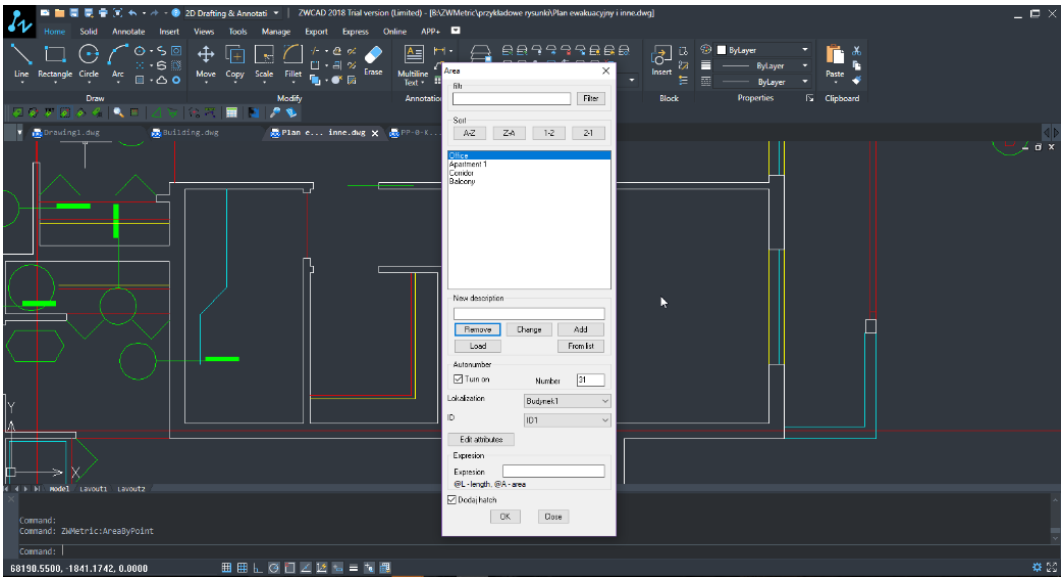
The text settings in the description block and background are available in the settings.

3.4 Area By Point

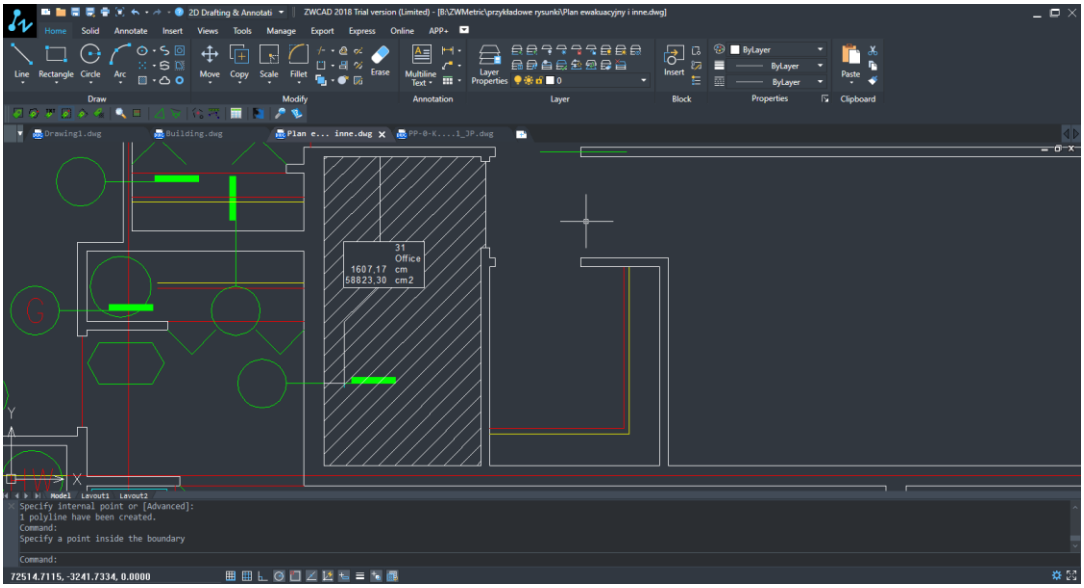
Command: `ZWMetric:AreaByPoint`

By using the function Area by Point you can define an area by specyfing a point within an object that we would like to describe.

Once activated, a window will appear where you will have to define the name of the area, auto numeration and hatching.



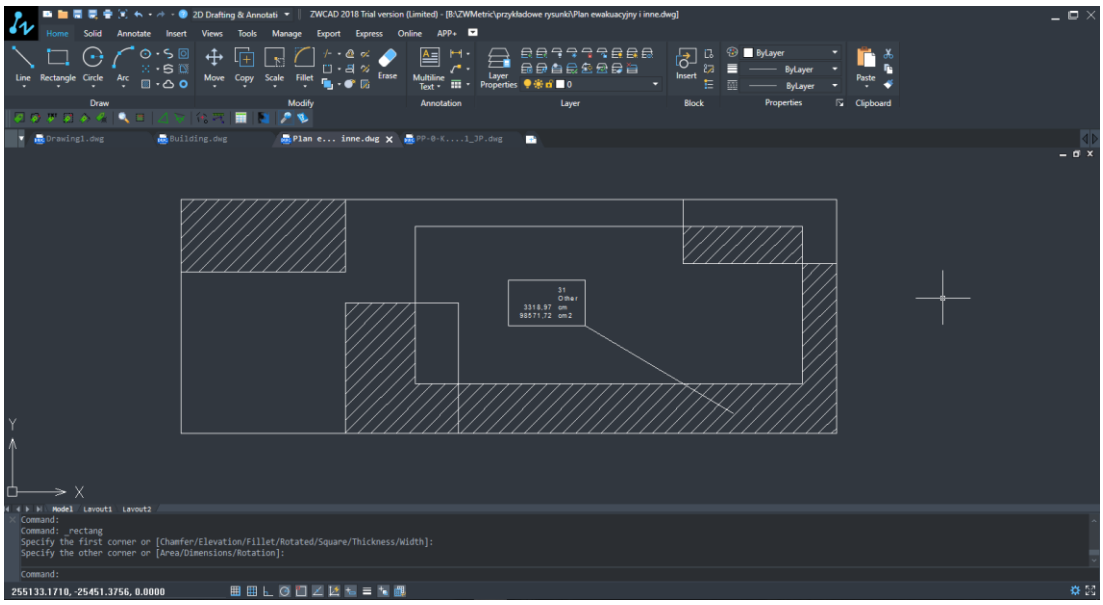
Afterwards, specify a point within a closed area which is going to be described.



The command lets you specify more than one area.

On the example below we can see a few closed areas.

When activated, Area by Point will let you specify points within closed areas. Once done confirm by pressing Enter.



It is necessary to specify a desired place for your description block.

The size of description and desktop properties can be found in the settings.

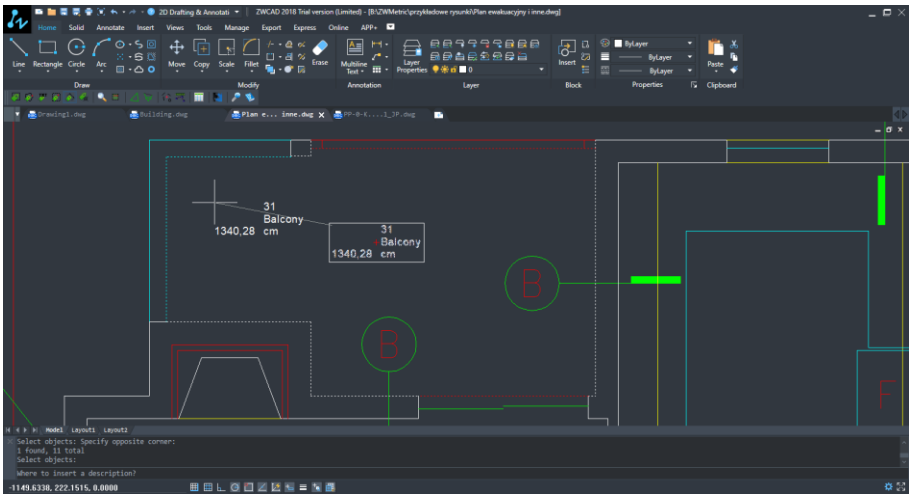
3.5 Line Measurement

Command: `ZWMetric:MarkLinear`

This function works analogically to the function Area Measurement with one difference. Only the lines will be calculated, not the whole area of a selected object.

Once the function is activated, you need to define the name.

Now choose next objects as well as the insertion point of the description line.

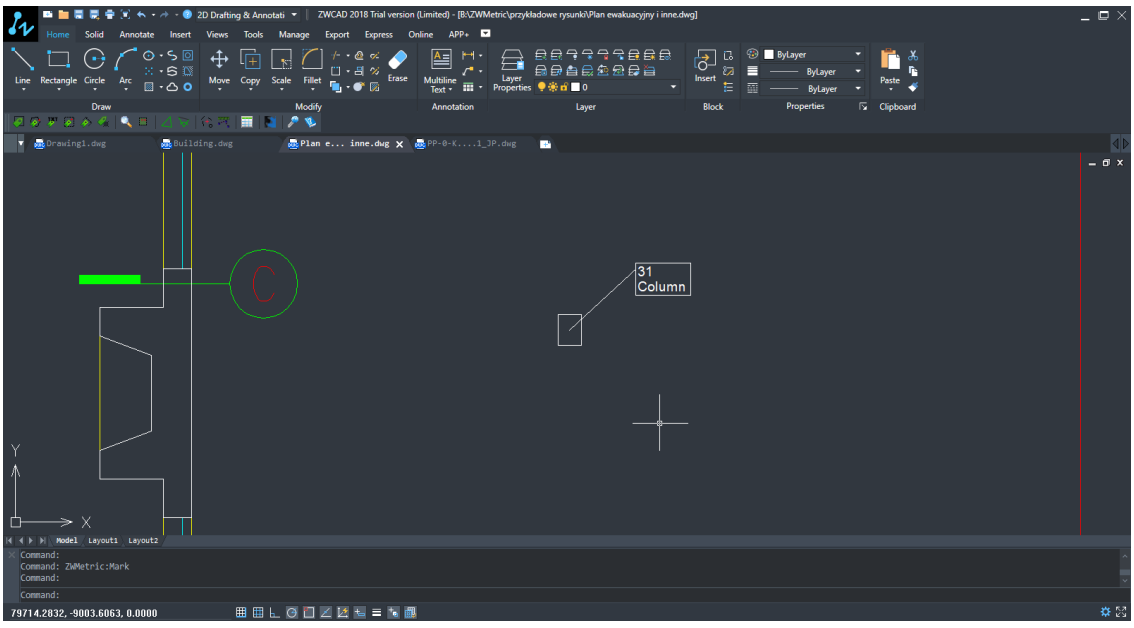


When you insert a descriptive line at the end is inserted description of the object taking into account its circuit.

3.6 Mark Objects

Command: `ZWMetric:Mark`

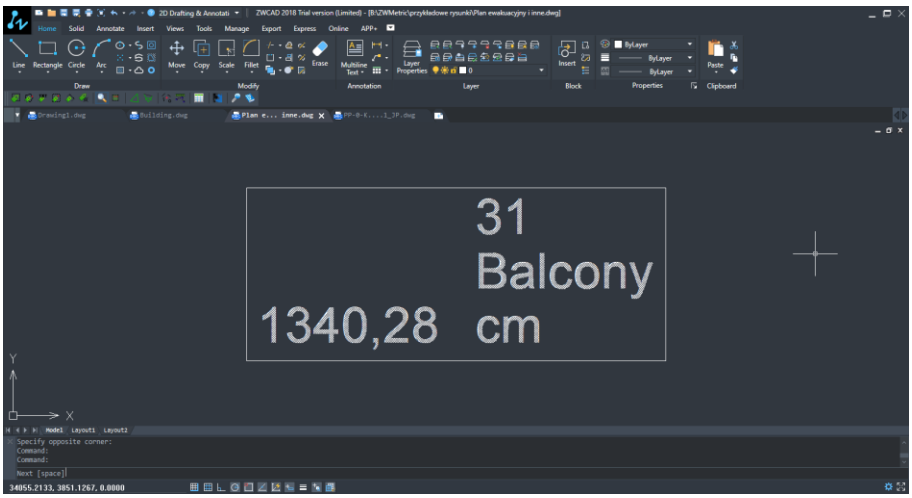
Function inserts description in selected points, optionally it can be automatically numbered.



3.7 Find

Command: ZWMetric:Find

This function find all description blocks where description attribute has the same or similar value as selected description text. After find such block, view is centered to description block. After press space found will be next elements with the same description.

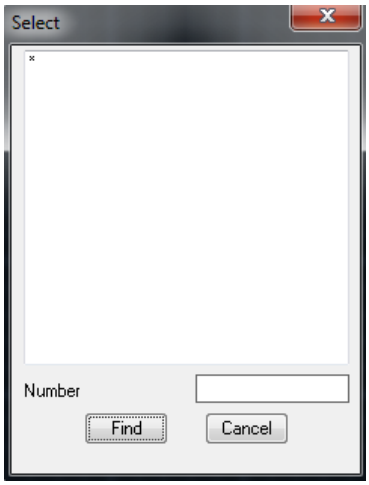


By selecting the element name and clicking the Find, program moves the item view.

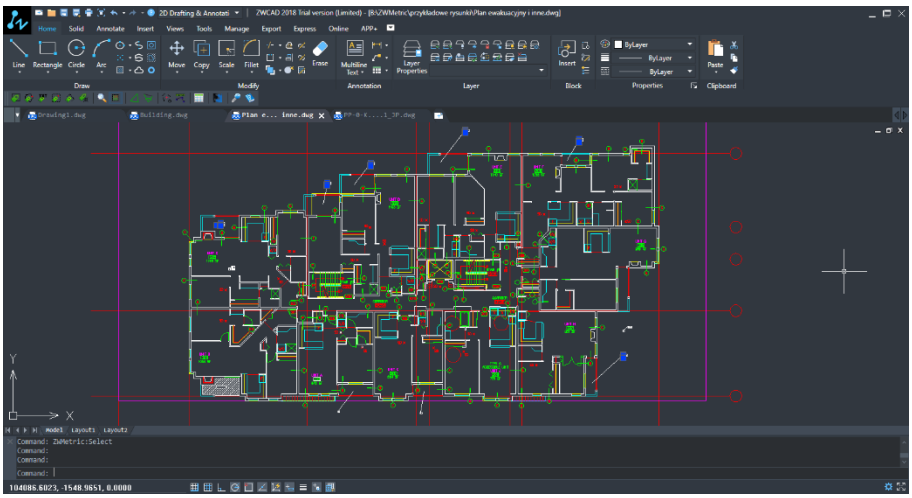
3.8 Select

Command: ZWMetric:Select

Selects all description blocks where attribute description is the same as selected by the User.



When you select an item and click Find, the program selects all items in the drawing area indicated by the user.



3.9 Draw a triangle by specyfing distances of sides

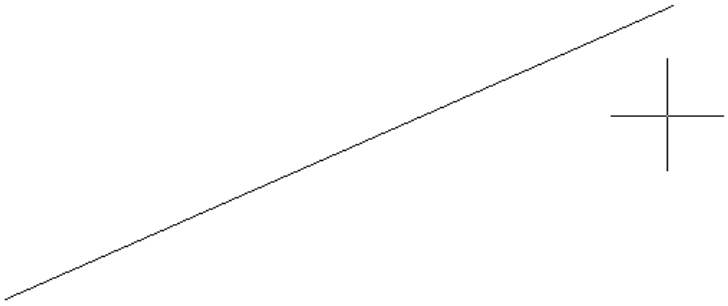
Command: `ZWMetric:Triangle`

This function lets you automatically draw triangles of specified sizes, as well as giving you the option to fit the object to an existing shape.

Once the command has been activated, specify the starting point of the triangle and its direction.

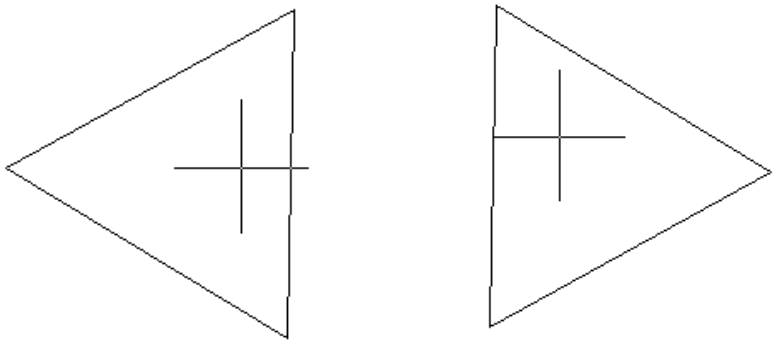
Now specify the distances of following sides.

The size can be defined by entering a value in the command bar or by using the cursor.



Now specify distances of next sides.

The size can be defined by entering a value in the command bar or by using the cursor.



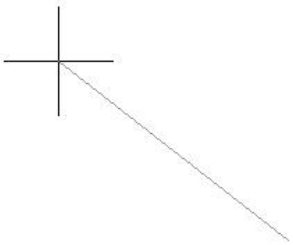
Once side distances are entered, choose a direction of the triangle.

3.10 Draw a triangle by specyfing an angle and length of two sides

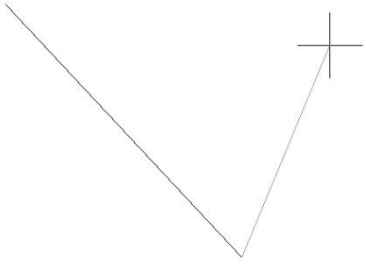
Command: `ZWMetric:Triangle:DDA`

This function is used to creating a triangle with an angle and length of two sides of your choice.

Once activated you will have to specify the top of the angle and the direction of the first side of the triangle.



Now enter the length of the first side, an angle and the length of the second side.



The angle needs to be entered in degrees or you can choose the function Measure from the toolbar. After typing in the shortcut “Z”, you need to determine the start and end of two lines in between which the angle will be measured.

Once all data has been entered, the last side of the triangle will be added and by using the cursor you should choose the direction of the triangle.

3.11 Sum of length

Command: `ZWMetric:SummLength`

User selects objects, then application calculates sum length of all lines, polylines, arcs and circles.

```
Selected 40 Objects
Sum of objects length = 1565.4453
```

3.12 Mdist

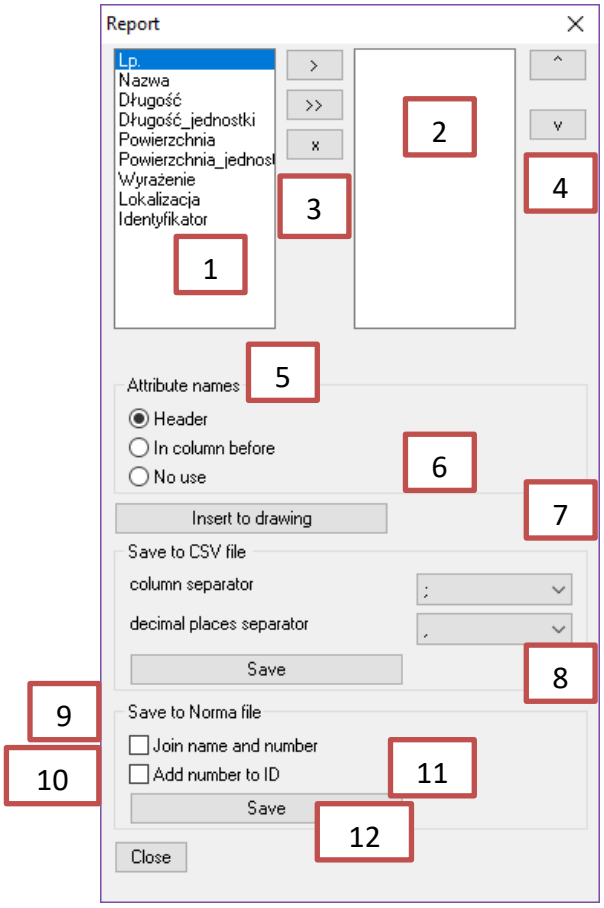
Command: `ZWMetric:MDist`

User pick points, then application calculates and display in command bar sum of all distances between picked points.

3.13 Report

Command: `ZWMetric:Report`

With this function, you can create a report of your measurements.



Report window.

In the window shown above we can see:

1. List of all attributes defined in selected block.

2. List of all attributes names, which will be considered in created report

3. Button which lets User to select attributes to report

4. With this buttons, You can decide order of columns.

5. Options to define, where will be headers of columns in report

6. After click this button, report will be inserted into drawing.

7. Settings to save data to text file. They let user to decide which mark will be columns and decimal places separators in saved file.

8. By this button You can save report data in external text file (with extension CSV)

9. Setting to define if safe to Norma file format will be with number and description join in the same column.

10. Setting to define if safe to Norma file format will be with number and ID join in the same column.

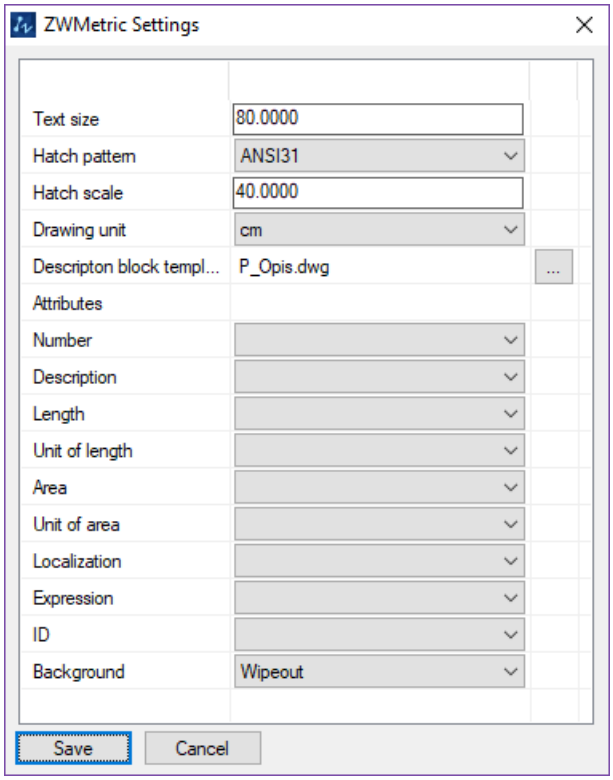
11. By this button report will be saved in external text file with format corresponding with application Norma.

12. Button to close report window.

3.14 Settings

Command: `ZWMetric:Settings`

This command lets you change the settings of ZWMetric.



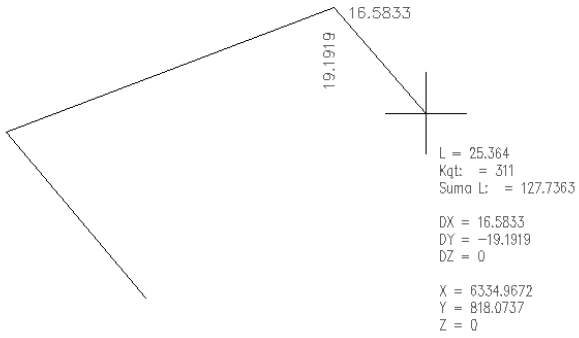
Settings window

Available settings include:

- Text size – by this setting, User can define size of description.
- Hatch pattern – User can select one of predefined patterns which will be used in new created markings.
- Hatch scale - scale of fulfillment used to describe areas.
- Drawing unit – selected here unit will be add in description block. Unit will be only set in description, there is NO any calculation between units, only name of unit will be set in description.
- Description block template – in external file, You can define block with own attributes, by this setting, You can choose which block will be used in descriptions
- In next rows, User may select which attributes of selected description

3.15 ZWMetric:LL

This command uses parameters from the function ''Area Outline'' and by using it we can create more lines without hatching and description blocks. To carry out the function refer to the ''Area Outline''.

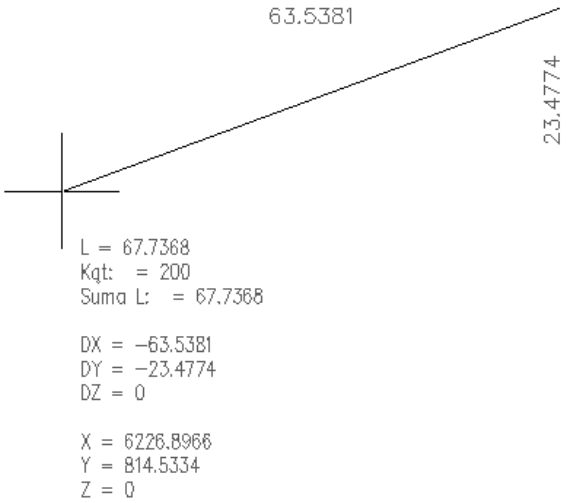


3.16 ZWMetric:DD

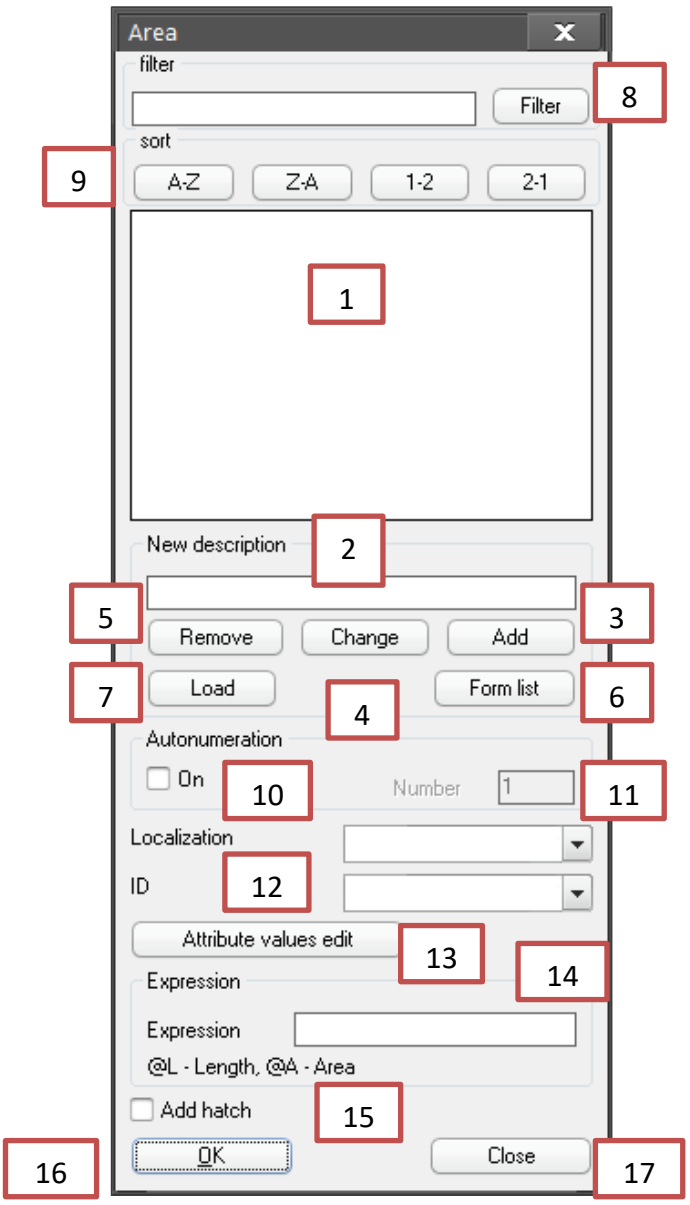
This function lets you measure by using parameters avaliable in the ''Area Outline".

By specyfing two points on a drawing, you can find the value of certain parameters such as angle or coordinates.

Additional options will be displayed in the command bar once the function is called.



4 Description Window



Description window

1. List of descriptions –contains all descriptions defined in drawing.

2. New description. In this field, You should write text of new description, which will be add to list or change value of other selected description.

3. Add–after click this button, new description will be add to descriptions list.

4. Change - click of this button will cause, change of description text.

5. Remove –Description selected in list [1] will be removed.

6. Loads selected description from list to edit description field. In this way You can load description, change it, and save as new description, without need of retype full, often long, description.

7. Load – loads all description used in drawing. It may be need if all drawing was not crated by application ZWMetric or for example part of drawing was copied from other drawing, to new one, where there is no defined descriptions.

8. Filter – more about it, You can find in chapter Description filtering 6.1.

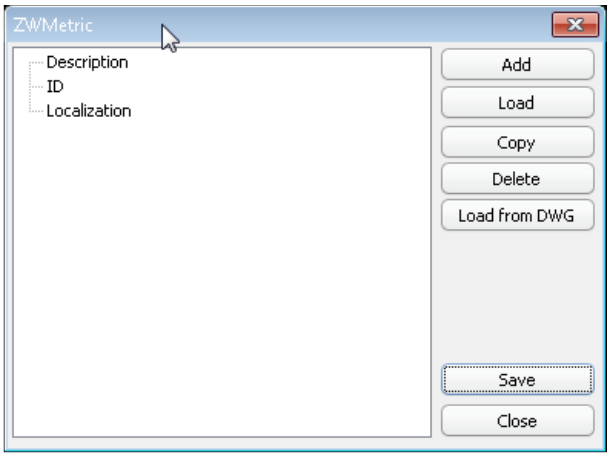
9. Sort - Descriptions you can sort in aphabetical order [A-Z], in reversed aphabetical order. Creation order [1-2] or reversed creation order.

10. Auto numeration Turn on – If You want, new descriptions to be numerated (each one can have own ID number) You can just turn on auto numeration. You don't have to remember next number, just click this option to start automatic numeration of descriptions. Following numbers will be automatically increase by 1.

11. Automation umber. Start number. From this number each description will be numerated. Each description will have number incremented by 1.

12. Additional attributes: Localization, ID. Values of this attributes can be automaticaly filled by information. Names of this attributes have been fixed for compatybility with application Norma, but You can set there wehatever informations like type of florring fot selected area.

13. Attribute values edit. Using of this button will move to new window, where user can define values of attributes which can be set to attributes licalizarion or ID. Values can be set manually, load from file or load from external text file.



Attribute value edition window

14. Expression. Lets You to write value of expression which will be set in new description block. Values will not me automatically calculated in time of work with application, but You can use some variables. If You use @L in expression filed, instead of this signs will be set length of calculated circumference of selected object. In the same way @A will be replaced by area of selected element.

15. Add hatch. – In case of describe areas, You can fulfill areas using hatches. After click OK[16], user will be asked to select outer loop, then inner loop which will be subtracted from outer loop. Path and scale You may set in application settings .

16. OK. – Insert description.

17. Close – close window without any changes.

5 Additional information

5.1 Description filtering

Filtering descriptions lets You limit descriptions displayed in list. Filter works on regular expression it means, that text or it parts, can be replaced by signs for example * or ?

Examples:

***** Replace any number of any signs: '**a***', will display descriptions where first letter is 'a': axb, akcb, a122b, and so one. If we write '***c**', in list displayed will be all descriptions where last sign is 'c' abcdfgc, 123c.

? Replace any sign, but only one sign: '**a?b**', will cause displayed texts asb, a4b but will not display accb,

~ Limits displayed descriptions, to all were signs after ~ will not be present. So: '~ab' will display all elements where will be no signs ab together. Signs a and b may be present in description but not together

Filter replacing digit. Example: a#b displayed will be a1b a9b but not asb.

5.2 Description window size

If size of window is too small, and you want more descriptions to be visible at the same time, or window is too big and can't be displayed on Yours screen, You can customize size of window.

You can do it by edit file UIen.DCL for English version or UIpl.DCL for polish language. This file is located in dictionary, where application is installed (default C:/Szansa/ ZWMetric) Please find there following block:

```
:list_box {key="Opisy";
        label = "";
        value = "0";
        width=36;
        height=30;
        multiple_select = false;
        allow_accept = true;
}
```

You may change properties:

width –width of window
height –height of window

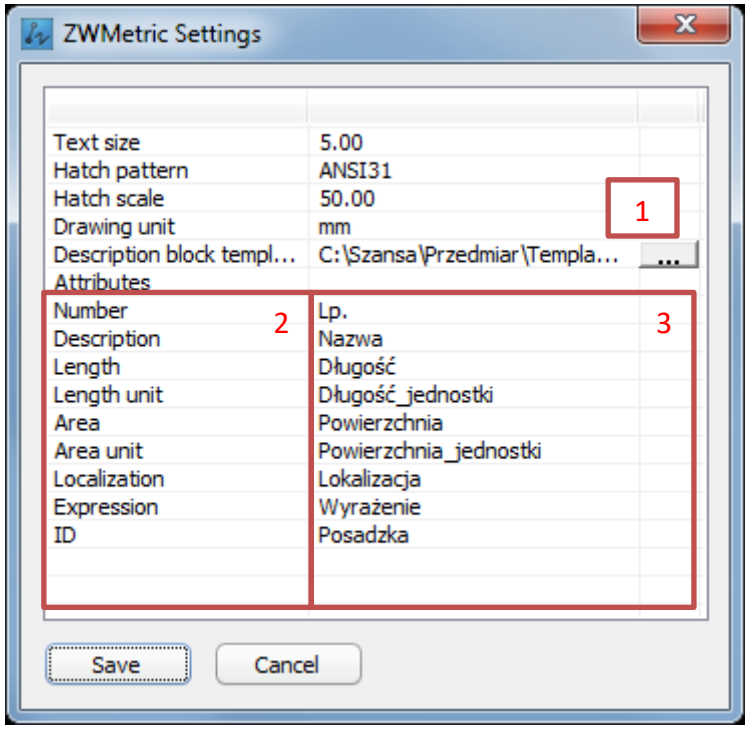
In these properties, you must write numeric values.
After change this values,please save this file, changes will be applied automatically after next open window.
Warning:
Edit other values in files *.DCL, may cause wrong working of application, or even crush of application! If this happens please contact our technical support.

5.3 Description within the drawing is too small or too large

Size of description depends on units used in drawing, and scale of drawing. If default size is not correct, (description is to large or too small), You can change size of new created descriptions. You can do it in settings of application. Settings You can run b command P_Setts or click icon . In properties window, You can change text size value. Size written in this field must be numeric and grater then 0.

5.4 Change description appearance

With application there are installed two templates of description block. One for polish version, second for English one. If appearance of description block is not good for project, or You have to use other standards, You can define own description template. To create own template the best way is to edit one of default blocks. Especially important is placement of attributes, You should place them somewhere around begin of global coordinate system because this is insertion point of description. Also important is that description block have to contains attributes. If template contains attributes some of them: number, name, length, area ID, localization, will be fulfilled automatically only if such attributes are defined in template. Names of attributes may be different than those used in template. In this case you should join attributenames with function. Such join you can do in settings of application.

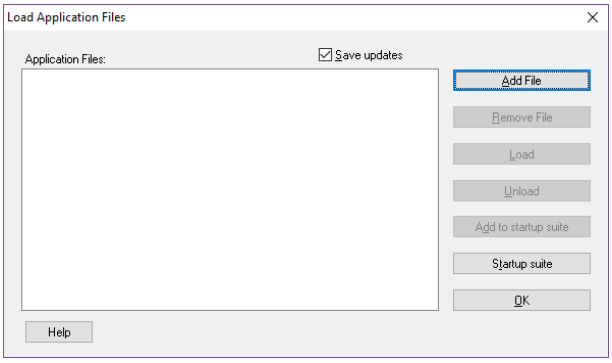


To set template to drawing, You should find path for description block template by button[…][1].After select of new file, names of attributes will be cleared [3]. In column [2], there will be enumerated functions of automatically filled attributes. If You click in column [3] in row of interesting function, there will be list of all attributes names used in drawing. You can select attribute, where ZWMetricwill insert value of such function.

5.5 Loading the application manually

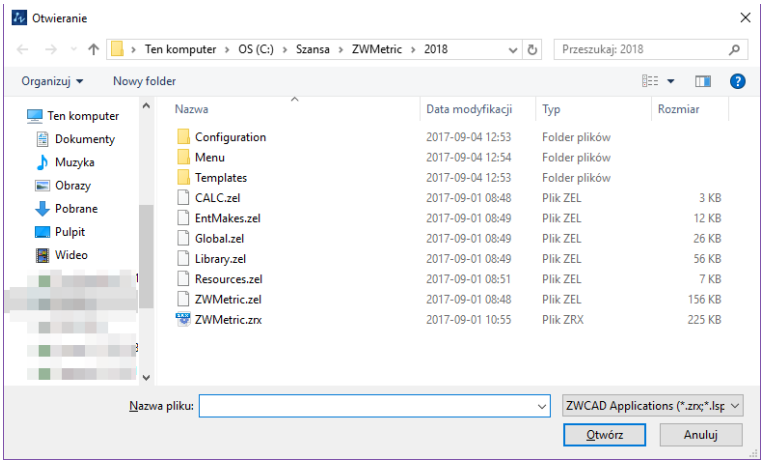
After installation of application, it should be automatically load to ZWCAD. Function should be available and toolbar with icons should be visible. If for some reasons it's not load automatically, You should load in manually. To do it, You should follow steps:

1. Run command appload and You will see window:



2. Click `Add File`.

3. In new open window change default extension to .zel. than find path where application has been installed. Default its `C:\Szansa\ZWMetric\2021` , select file `ZWMetric.zelx` and press `Add`.



4. On appload window click `Load` to load application,

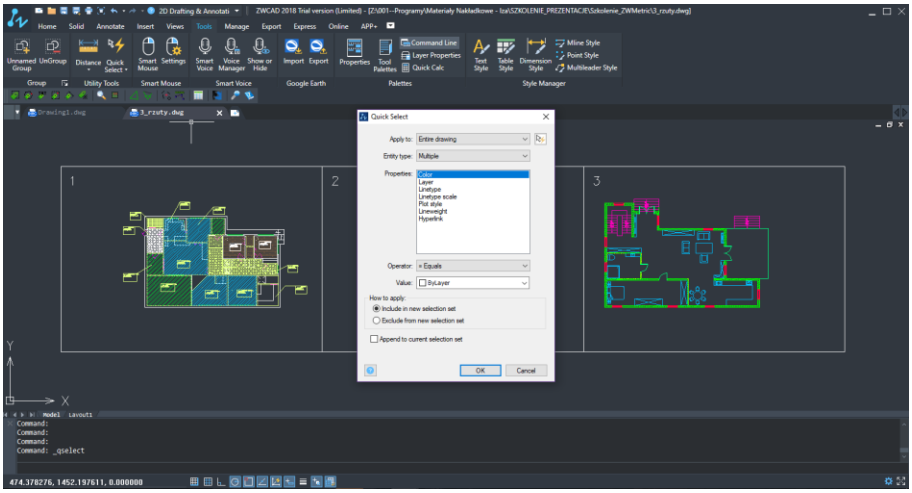
5. If you want application to be loaded automatically each time you run ZWCAD 2021, please select `ZWMetric.zel` on list of files to load, and click button `Add to startup suite`.

6 Tips for working with ZWCAD

6.1 Quick select (qselect)

Quick select allows us to identify a select group of items when you specify the features that interest us, for example and indication of all the lines of the same color are all placed on the descriptions.

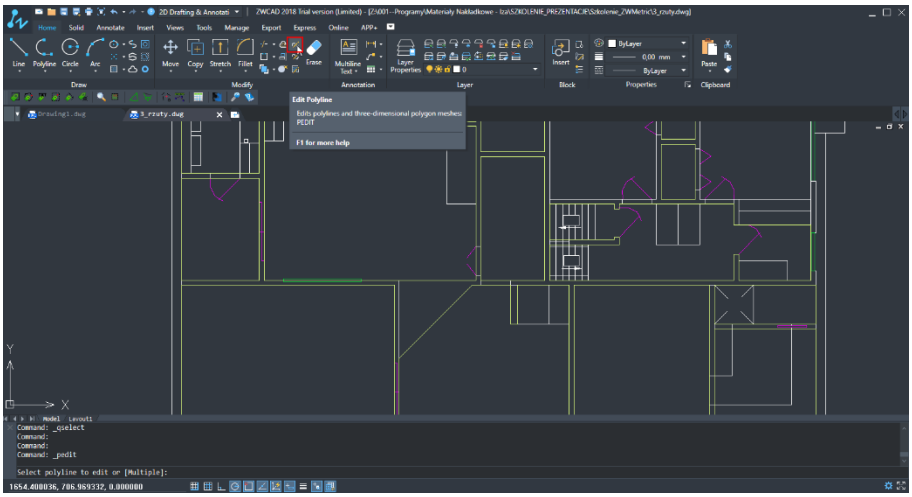
Command : `qselect`



6.2 Polyline Edit (pedit)

You can edit polyline or polylines, You can close it by crossing the line between the first and the last segment do You want to change the line width.

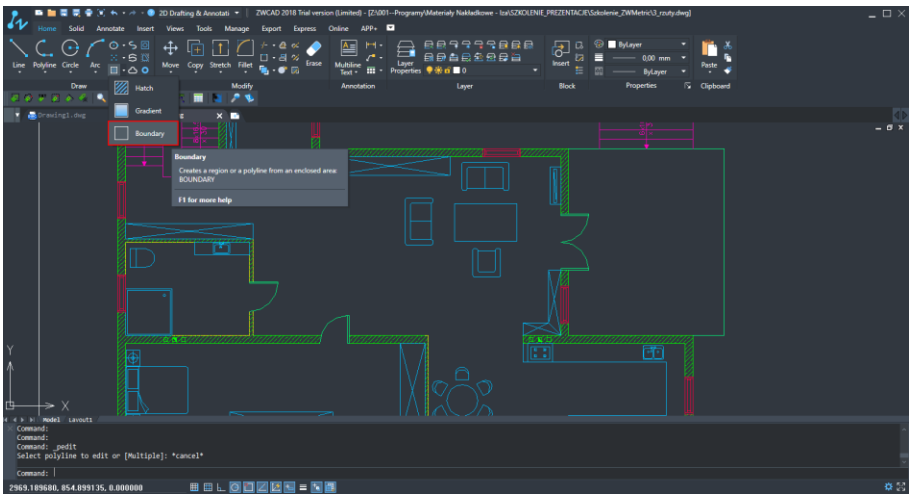
Command: `pedit`



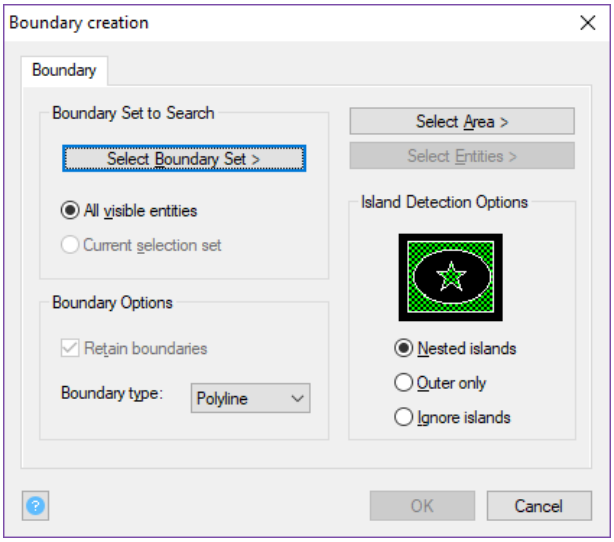
6.3 Boundary (_boundary)

Command: `boundary`

In the case of complex surfaces, You can stroke it use the bounding box. Click in the middle of the area – the program automatically creates a polyline or region (depending on Your choice).



After activating the command window appears in which You specify the type of object and specify the center point of the element.

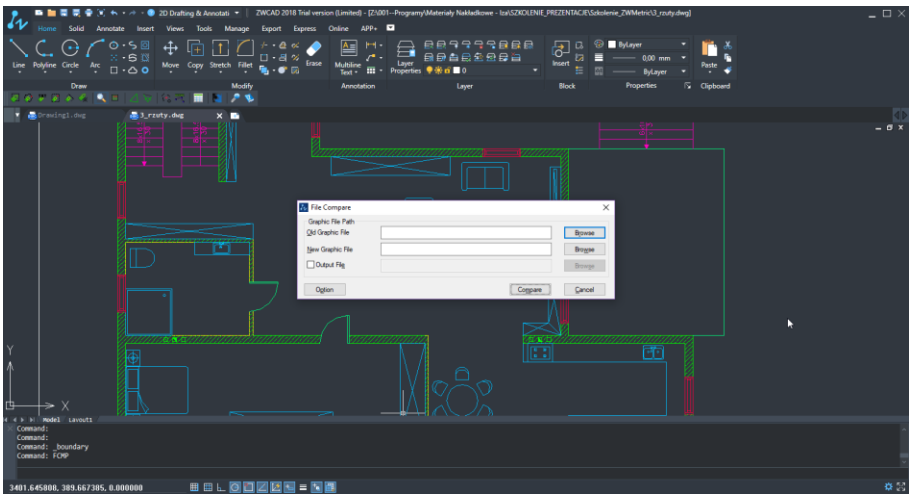


In the command line you will see each step of the implementation of the function.

6.4 File compare (_fcmp)

Command: `_fcmp`

This is a very useful feature for comparing changes between two versions of the same file. The program asks for two files and identifies changes.

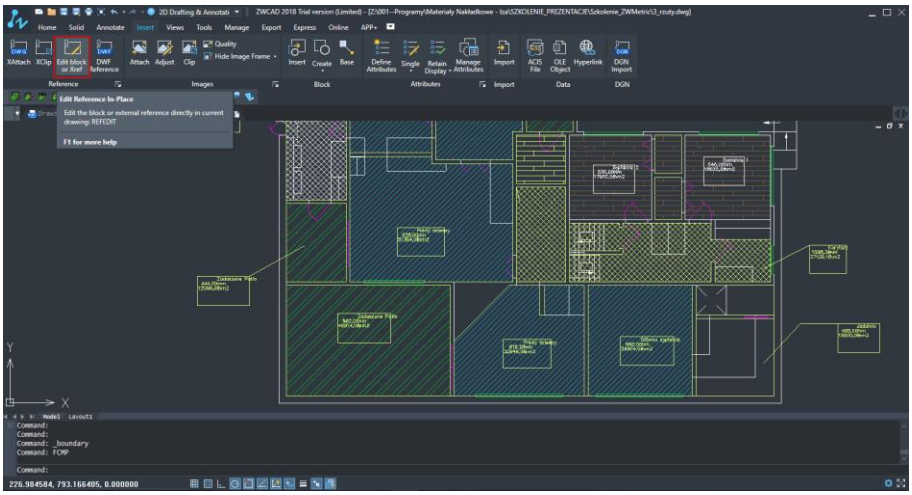


6.5 Changing the appearance of the description

1. Start the function

Command: _REFEDIT

In a very simple way you can edit the description of the block: INSERT -> Edit block or xref



Select a block of editing in the Reference Edit select the link name and click OK. Now You can edit the selected items.

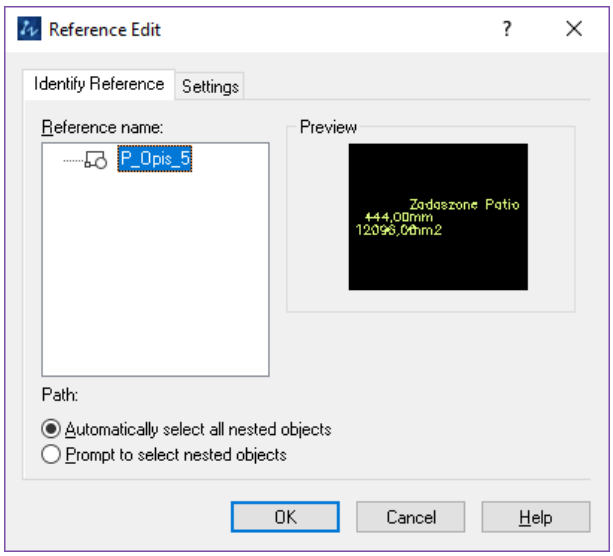
2. Description edit

We choose an interesting position highlighted in white and make editing
- change the appearance of fonts

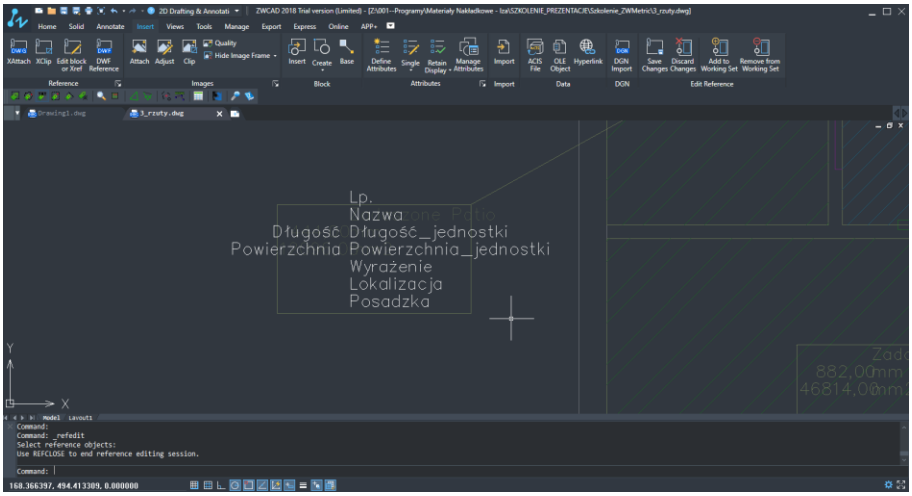
- change the position of the item description

- edit visibility, etc

Select the block to edit and click Ok.

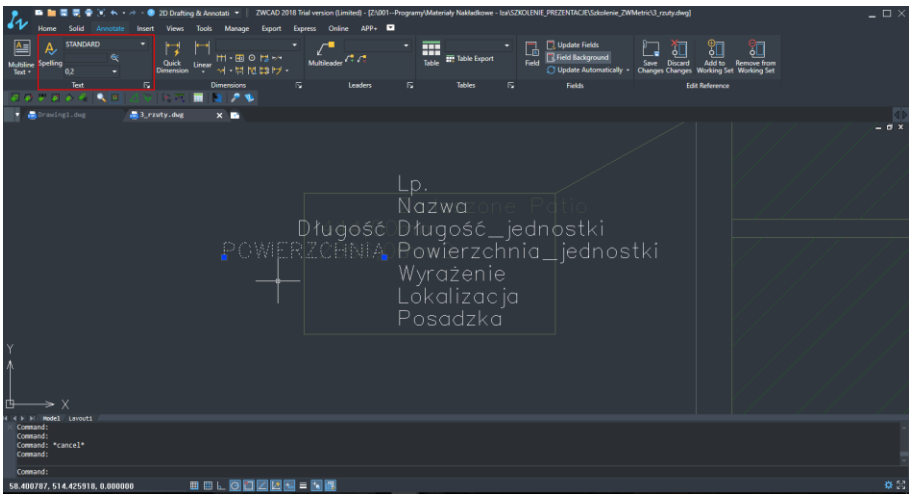


Now You can edit the select items.



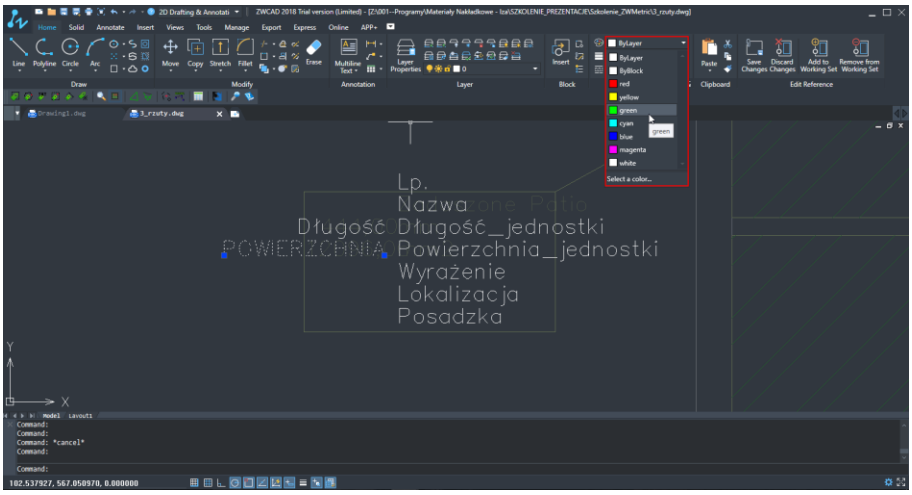
Change the style of description

Possible to modify the style description of selected items such as Oblique Angle → Apply →OK. Assign a style to the selected item description block.



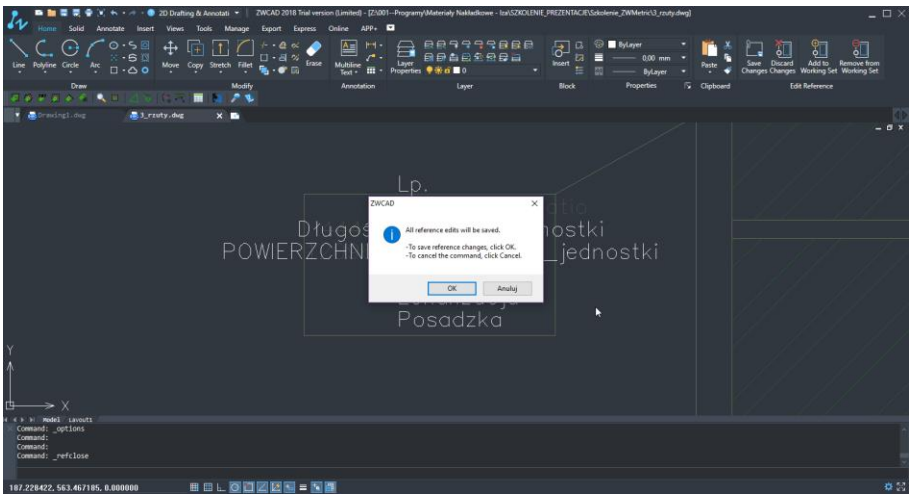
Modification the description of the selected items.

Using the properties of the object, there is the ability to edit multiple items:
General: color, layer, etc.
Text: style, height, obliquing, etc.
Geometry: XYZ position
Misc: text upside down , invisible elements of the description, etc.



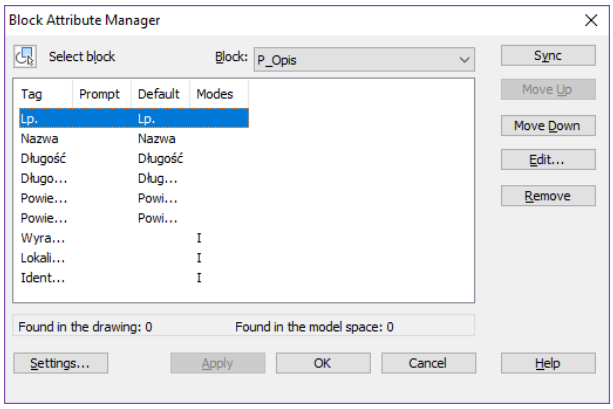
3. Save the changes

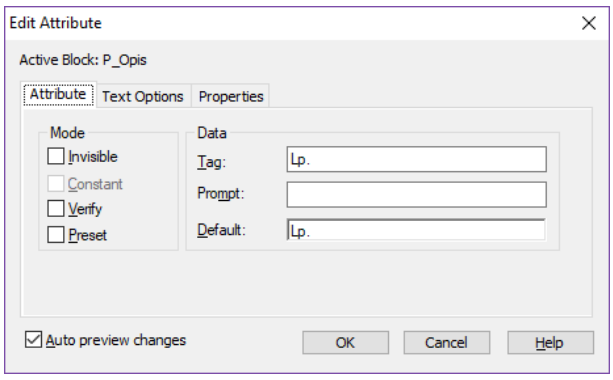
All changes should be save → Save changes



4. Update previously inserted descriptions

Updated descriptions for all blocks: in the command window, type BATTMAN and synchronize selected items.
You will see the window with the ability to edit item all blocks. You should mark the element from the list and then click `Edit`.





Changing for example the color of the element it will change all the same blocks.