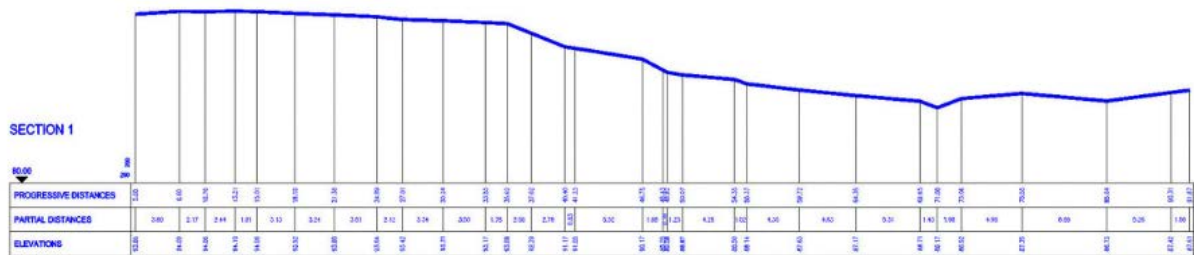


AutoSEZ

AddOn **for** progeCAD

Original AutoSEZ software powered by Gian Paolo Cattaneo



Automatic extraction of sections and terrain profiles

www.progesoft.com

CAD Solutions

AutoSEZ AddOn

With AutoSEZ it is possible to automatically extract Sections/Profiles of the ground from different types of 3D models and to draw their relative quoted cartouche.

AutoSEZ for progeCAD - by Gian Paolo Cattaneo

DATA EXTRACTION

Model DTM 3Dface
 Lines and 3D polylines

Profile 3D Polyline in the model
 2D Polyline on plane

SECTION DRAWING

3D Polyline in the model
 2D Polyline on plane
 On title block

Reference elevation
First point elevation

MODEL LAYERS

All Layer --> 0 Select <

TITLE BLOCK

Starting Picket line number TITLE Insert
Starting progressive Auto increment
Legend length SECTION 1

Midpoint elevation

Text H
Elevations
Legend
Title

ROWS

Row	Description	Row H
<input type="checkbox"/> Picket line	PICKET LINE	7
<input checked="" type="checkbox"/> Progressive	PROGRESSIVE DISTANCES	10
<input checked="" type="checkbox"/> Partials	PARTIAL DISTANCES	10
<input checked="" type="checkbox"/> Elevations	ELEVATIONS	10

SECTION'S LENGTH

Sectioned objects
 Section line

FILTER

Delete aligned points
Distance filter

DRAWING SCALE

X Scale
Y Scale

TITLE BLOCK UTILITY

OK Cancel Help

The procedure creates the following text styles, if not present in the dwg:

- **AS-LEGEND** for the texts of the legend;
- **AS-ELEVATION** for elevation texts;

Change these styles in case of any customization of the texts.

The following layers are also created:

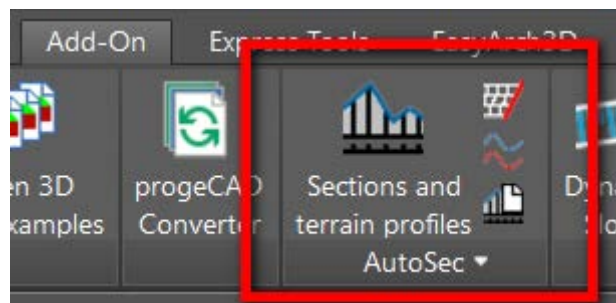
- **AS-TITLEBLOCK** for the Title block lines;
- **AS-LEGEND** for the texts of the Legend;
- **AS-ELEVATION** for elevation texts;
- **AS-PROFILE** for new profile polylines. In case of data extraction from 2D polyline, this is maintained on the source layer.
- **AS-TITLEBLOCK-CENTERLINE** if is enabled the option to dimension the center line of the title block.

NOTE: The lines used to draw the sections must be drawn on the **SECTIONS** layer
You can draw the section lines directly with our "Draw section line" command.
This function automatically creates and assigns the correct layer (SECTIONS) to the traced line.



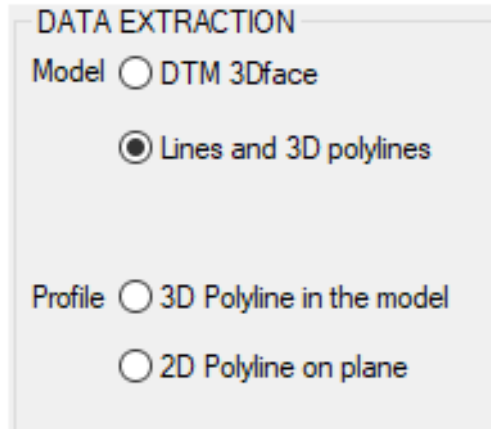
"Draw section line"

You can run the main function by typing AUTOSECTION (AS alias) at the command line, or by using the related button (Section and terrain profiles) in the AddOn menu/toolbar or Ribbon panel.



Box: DATA EXTRACTION

Choose the type of data from which to extract the Section



DATA EXTRACTION

Model DTM 3Dface
 Lines and 3D polylines

Profile 3D Polyline in the model
 2D Polyline on plane

MODEL

Select the model type:

- **“DTM 3D face”** AutoSEZ use the intersection of Section line with the Digital Terrain Model drawn with triangular 3D faces.
- **“Lines and 3D Polylines”** AutoSEZ uses the intersection of the section line and the lines or 3d polylines used to join the 3D terrain points. The polylines can also be closed and/or crossed several times by the section line.

NOTE: The procedure excludes from the calculation all the other types of entities and those drawn on the SECTIONS and AS- PROFILE layers.

This last aspect allows to maintain on the model all the section lines and the profiles that eventually intersect, excluding the possibility that they can interfere in the calculations.

will be asked:

Select a section line or [2 points]:

The selection must take place in plan view and can be carried out:

- **Selecting an existing section line (default):** the line must be drawn on the "SECTIONS" layer, the vertices can have a zeta coordinate different from 0.00. The position of the selection point influences the design direction of

the profile, then select outward the end of the line to which the start is to be assigned.

- **Selecting two points on the screen:** using the option "2 points", the command will request the two extreme points of calculation.

PROFILE (existing)

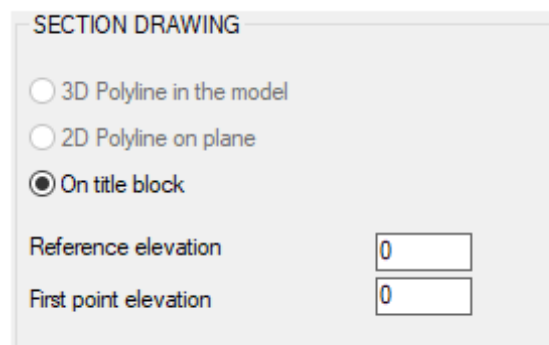
Select the profile type:

- **3D polyline**, drawn on the model, is the terrain profile. The position of the selection point influences the drawing direction of the new profile, then select outward the end of the polyline to which the start is to be assigned.
- **2D polyline**, drawn on the plane, which represents an existing terrain profile.

NOTE: the entities to be selected for the calculation can be drawn on any layer.

Box: SECTION DRAWING

Set the type of output for profile



SECTION DRAWING

3D Polyline in the model

2D Polyline on plane

On title block

Reference elevation

First point elevation

Select the model type for output:

- **“3D POLYLINE IN THE MODEL”:** A 3D Polyline is created on the model (above the section line) whose vertices are the intersection points of the section line with the 3D entities selected for the calculation.
- **“2D POLYLINE ON PLANE”:** A 2D Polyline is created on the plane.

- **“ON TITLE BLOCK”**: A 2D Polyline with title block is created, automatically annotating the pickets, elevations and distances.

Depending on the choice of data extraction type indicate:

- Reference elevation
- First point elevation

Once the calculation is completed, the insertion point of the title block is requested, excluding the case of data extraction from 2D Polyline, in which the title block is added directly to it.

NOTE:

Some buttons are deactivated depending on the choices made, all the active buttons then influence the result.

The following table shows the possible combinations for data input / output.

		OUTPUT		
		3D Polyline on the model	2D polyline on the plane	on title block
INPUT	DTM 3Dface	x	x	x
	Lines and 3D Polyline	x	x	x
	3D polyline on the model		x	x
	2D polyline on the plane			x

SPLINES or 2D POLYLINES MODEL

If you have a terrain model with level curves drawn with spline entities or 2D polylines, not currently supported by the program, you can convert curves to 3D polylines using the "Convert level curves" command in the progeCAD menu.




This command is useful to convert unsupported entities and to be able to use them with our AUTOSECTION command.

Box: MODEL LAYERS

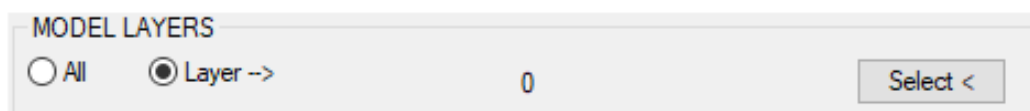
Selection of drawing output

In case of data extraction from 3D model it is possible to set the layer to be considered for the calculation of the section:



The screenshot shows a dialog box titled "MODEL LAYERS". It contains two radio buttons: "All" (which is selected) and "Layer ->". To the right of the "Layer ->" button is a small square icon containing the number "0". On the far right is a button labeled "Select <".

With the " All " option, all the layers of the model are considered.



The screenshot shows a dialog box titled "MODEL LAYERS". It contains two radio buttons: "All" and "Layer ->" (which is selected). To the right of the "Layer ->" button is a small square icon containing the number "0". On the far right is a button labeled "Select <".

With the " Layer " option, a single layer is considered.

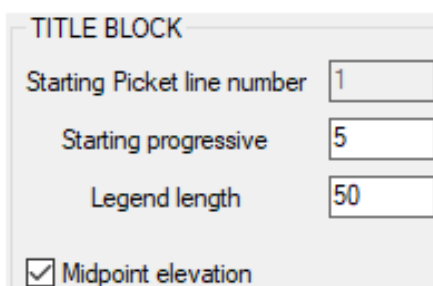
If present in the DWG, the last used is repeated (also in another session of progeCAD), otherwise the layer 0 is indicated.

With the button graphic you can set a layer by selecting an entity in the drawing.

NOTE: The " SECTIONS " and " AS-PROFILE " layers cannot be selected.

Box: TITLE BLOCK

Drawing of a profile with the title block with distances, partial distances, elevations, etc.



The screenshot shows a dialog box titled "TITLE BLOCK". It contains three input fields: "Starting Picket line number" with the value "1", "Starting progressive" with the value "5", and "Legend length" with the value "50". At the bottom, there is a checked checkbox labeled "Midpoint elevation".

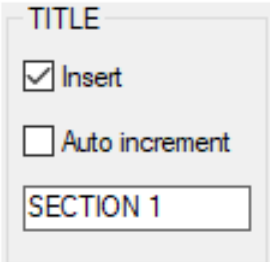
You can define:

- Number of the initial picket (if his row option is enabled);
- Value of the initial progressive (if his row option is enabled);
- Length of the legend column, expressed in plotted millimetres.

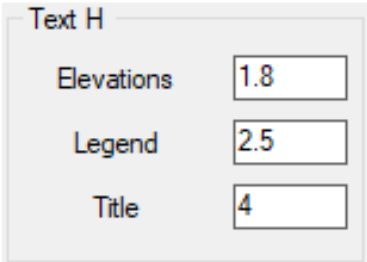
Enabling the "Midpoint elevation" option inserts a new vertex in the 2D profile polyline, at the center line of the title block. The result is therefore influenced by the choice made in the "SECTION LENGTH" setting.

The vertical line between the title block and the profile is drawn on the layer "AS-TITLEBLOCK-CENTERLINE".

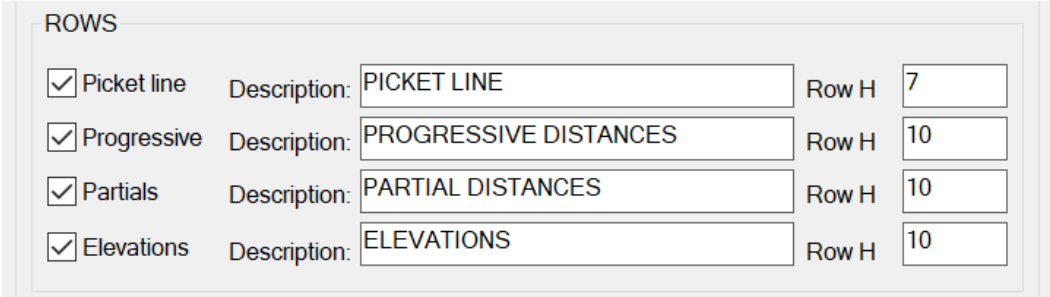
NOTE: The new vertex is not inserted in case of data extraction from 2D polyline.



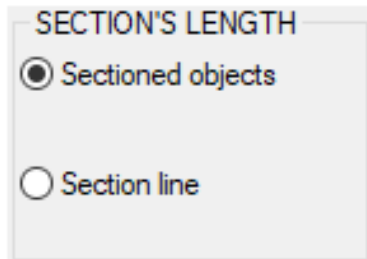
TITLE: It is possible to enable the insertion of the section title, the possible progressive numerical suffix at each launch of the program, to define the title.



TEXT H: Set the texts height, in plotted millimetres, of elevations, legend and title.

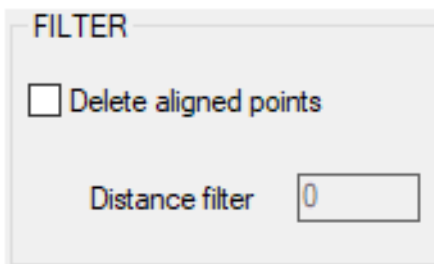


ROWS: Enable and customize the dimensions of Pickets, Progressives, Partials and Elevations. The heights of the rows are indicated in plotted millimetres.



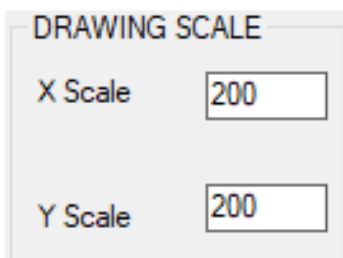
SECTION'S LENGTH: Extracting the data from the 3D model it is possible to choose whether to calculate the section of only 3D objects that are intersected, or for a calculation distance further equal to the length of the section line, thus inserting in the title block the distance that separates the beginning of the section from the first object (both left and right).

In the case of a section line having its origin inside a triangle (3D face model), the program calculates the position of the starting point on the plane passing through the vertices of the 3D interface, generating a complete profile.



FILTER: It is possible to enable the function and insert a filter to not draw points close to the previous one (based on distance).

Pay attention to the fact that the actual end points may not be drawn if discarded by the filter.



DRAWING SCALE: Set the profile representation scales and title block. The reference scale for plotting is the X Scale.

NOTE:

- The dimensions are expressed in meters and are text entities (therefore the STRETCH command has no effect on the values of the dimensions).

- The DIST command returns the true measure of the horizontal distances, while the vertical ones are a function of the ratio between Scale X and Scale Y set.

Extra Utilities: TITLE BLOCK UTILITY

Edit the Title block

AutoSEZ - EDIT TITLE BLOCK ROWS

Click on an image and press OK button to run the utility.

1. Edit progressive distances

2=FIRST PROG.
SECTION 1

PROGRESSIVE DISTANCE	0.00	3.97	10.51	13.65
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2. Edit partial distances

SECTION 1

PARTIAL DISTANCE	3.97	6.54	3.18	4
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3. Edit elevations

3=ELEVATION
SECTION 1

ELEVATIONS	84.58	84.57	87.41	86.73
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4. Join partial distances cells

SELECT TWO TEXTS INDIVIDUALLY...

PARTIAL DISTANCE	6.47	5.04	3.18	4
------------------	------	------	------	---

...ELSE, TROUGH WINDOW

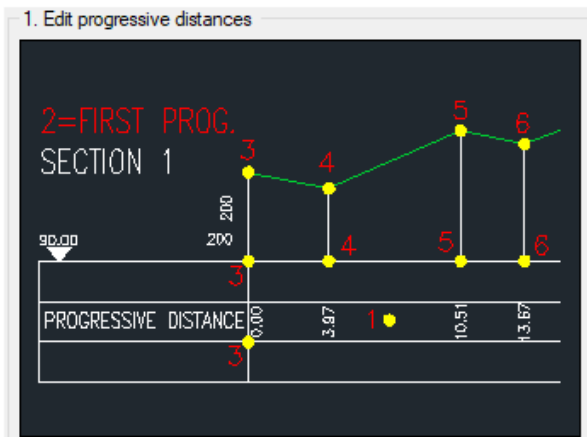
NOTE: Utilities 1 - 2 - 3 are influenced from Scale and Text H values.

X Scale = 1200 Y Scale = 1200 Text H 1.8 mm

<-- OK Cancel Help

1 - PROGRESSIVE DISTANCES

The selection of the row to be filled in is requested, the value and the position of the initial progressive, the selection of the points to be dimensioned.



The dimension is calculated for the difference between the X coordinates of the selected point and the initial point, regardless of their position Y. The appropriate osnap is automatically set for each request. The proposed default value of the initial progressive is the one set in the main window.

Procedure:

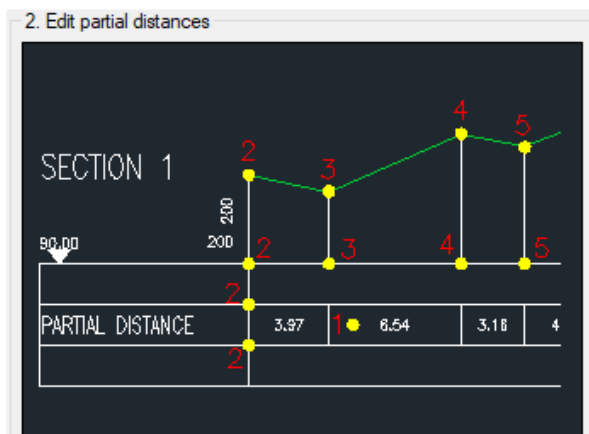
- 1 - Select an internal row point to compile > select point
- 2 - Initial Progressive <default> > type the value or press ENTER to confirm
- 3 - Initial progressive position > point to which the progression calculation is to be reported
- 4 - Next point ... > point to be quoted
- 5 - Next point ... > etc.

2 - PARTIAL DISTANCES

The selection of the row to be completed and the points to be quoted is requested.

The dimension is calculated for the difference between the X coordinates of the selected point and the previous one, regardless of their position Y.

The appropriate osnap is automatically set for each request.

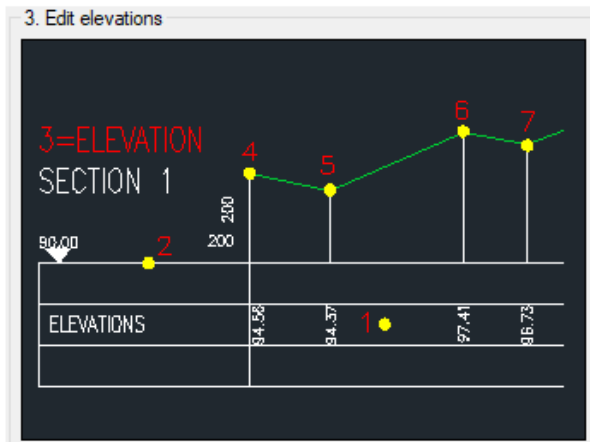


Procedure:

- 1 - Select an internal row point to compile > select point
- 2 - Select First Point of the segment to be quoted ... > select point
- 3 - Second point ... > select point
- 4 - Other point ... > etc.

3 - EDIT ELEVATION

It is required to select the row to be filled in, a point on the Reference Elevation line, the value of the Quota and the points to be dimensioned.



The appropriate osnap is automatically set for each request.

The <default> value of the Reference Elevation is the value set in the main window.

Procedure:

- 1 - Select an internal row point to compile > select point
- 2 - Select a point on the Reference Elevation Line > select a point
- 3 - Elevation reference <default> -->type the value or press ENTER to confirm
- 4- Select point for dimension > etc.

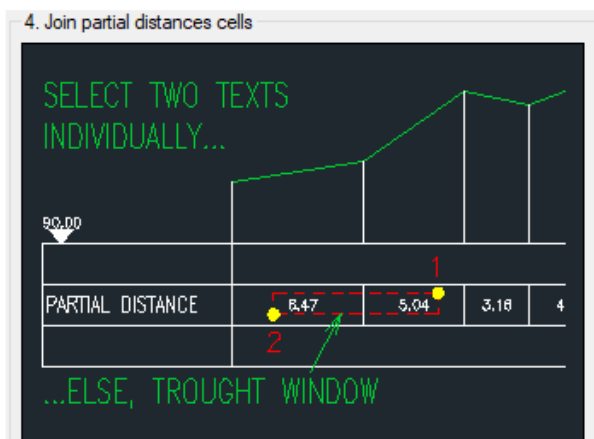
NOTE: The utilities 1 - 2 - 3 are influenced by the values of Scale and H text.

4 - JOIN PARTIAL DISTANCES CELLS

The utility merges two cells "partial distances" by inserting a dimension that corresponds to the sum of the two existing ones.

The new text is drawn with a height equal to the existing one on the left and is positioned on the center line of the new cell if the two existing ones are placed in the middle of the respective cells.

The actual width of the resulting cell is not checked.



Procedure:

Select with a window the texts of the Partial Distance to be merged > select the two texts individually or with "window".