# Creating a Land Survey in TcpMDT from Emlid Flow

This tutorial shows how to obtain with Aplitop TcpMDT the digital model of the terrain, contour lines and profiles from a topographic survey carried out with Emlid Flow connected to Reach RS3.

#### Summary

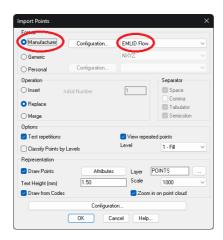
TcpMDT is a surveying software created by Aplitop. It is installed as a plugin in a CAD and offers tools to create digital terrain models, profiles, calculation of volumes, roads, etc. To integrate Emlid Flow data with the Aplitop TcpMDT application, you'll need the following:

- Emlid Flow v9.2+
- AutoCAD v2007 + or BricsCAD Pro v16+ or GStarCAD Professional v2021+ or ZWCAD Professional v2012+
- TcpMDT Standard v9.0+

#### Workflow

Below is one of the possible workflows, which consists of drawing the survey points, creating the digital terrain model, generating the contour lines, creating an alignment and obtaining long and cross sections. Importing Points

- 1. Start TcpMDT
- 2. Run MDT9 > Points > Import
- 3. Select format Manufacturer and choose EMLID Flow



4. Press the Configuration button and choose the PENZD option (Point Number, East, North, Z, Description). Also leave Convert code suffixes checked. Click OK.



5. Choose a suitable Scale for the representation of the texts and uncheck the Draw from Codes option.

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6. Click OK and choose the CSV file previously exported by EMLID Flow.

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7. The points will be drawn with their numbering and elevations.

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8. Run MDT9 > Points > List and verify that the points in the file have been imported

Points Selection	×					
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Level						
Code						
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Numbers						
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97 points selected of 97 available						
OK Cancel Help						

9. Press the All button and check that the point codes have been converted correctly. The ones with point geometry (e.g., TREE) appear as is, and the linear geometry ones are completed with the suffixes "S" for Start and "E" for End.

Name 🗸	Level	X Coord.	Y Coord.	Z Coord.	Code	
29	1 Fill	293.558	336.082	48.280	LS S	
30	1 Fill	289.114	330.595	48.280	LS	
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32	1 Fill	274.145	313.060	47.650	LS	
33	1 Fill	267.333	300.542	47.180	LS	
34	1 Fil	265.398	292.393	46.730	LS	
35	1 Fil	263.682	281.514	46.310	LS	
36	1 Fil	261.106	272.171	46.120	LS	
37	1 Fil	260.662	258.043	45.690	LS	
38	1 Fill	260.012	246.336	45.440	LS E	
39	1 Fill	279.269	252,746	45.540	TREE	

# Drawing Break Lines and Blocks (Optional)

TcpMDT can generate the digital terrain model more accurately by drawing the terrain slope changes, known as break lines. These can be drawn as polylines on different layers with CAD tools, or automatically generated if the points have been coded on the site. Blocks can also be automatically inserted from the codes (e.g. trees, manholes, posts, street furniture, etc.).

1. Run MDT9 > Points > Codes > Code Database

Code	Level	Type	Layer	Color	Thickness	Element	
Facade	Break	Line	Facade	1	Default	Continuous	-
Fence	Break	Line	Fence	4	Default	Continuous	
Filing	Fil	Point	Filing	3	Default		
Garden	Break	Line	06 Garden	83	Default	Continuous	
Headslope	Break	Line	Headslope	30	Default	Continuous	
Kerbstone	Break	Line	Kerbstone	161	Default	Continuous	
Lampost	Fill	Point	LAMPPOSTS	4	Default	Lamppost	
Limit	Break	Line	Limit	6	Default	Continuous	
Line1	Default	Line	Line	4	Default	By Layer	
LS	Default	Line	LOW SLOPE	6	Default	By Laver	
Manhole	Information	Point	MANHOLES	6	Default	03_P65	
Newjersy	Fil	Line	Newjersy	195	Default	Continuous	
OliveTree	Break	Point	OliveTree	3	Default	06 Olivo	
PARCEL	Break	Line	PARCEL	0	Default	By Layer	
Parking	Break	Line	Parking	252	Default	Continuous	
PATH	Break	Line	PATH	7	Default	Continuous	
		Edk	Insert Delete	Print Save As cel Help			

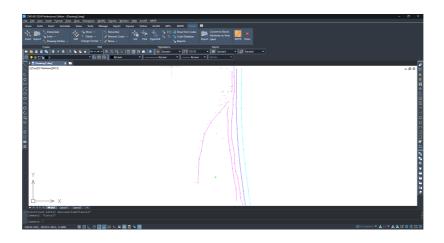
2. Select the item from the list to be modified and click the Edit button. The figure shows the LS code (Low Slope) which is of type Line and will be drawn on layer LOW\_SLOPE in Magenta color.

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⊖ Area	Line type		В	y Layer			\ \
	Polygon						
Select <	Hatch Type	SOLID					~
Description							

- 3. Press OK twice.
- 4. Run the MDT9 command > Points > Codes > Draw from Codes

Draw from Codes >	<
Range of Points	1
Initial Point 2	
Final Point 112	
Use sets of alphanumeric points	
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OK Cancel Help	

5. Click OK leaving all options by default



## Creating Digital Terrain Model

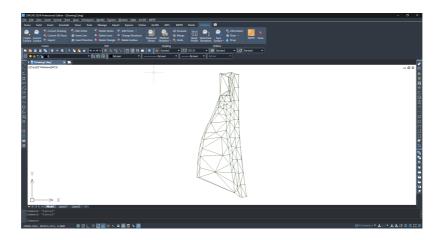
- 1. Run MDT9 > Surfaces > Create Surface and accept the proposed file name
- 2. In the dialog, check that within the Elements to Triangulate there are the elements Points and Break Lines. Tap the Layers button

Create Surface	×
Current Surface E:\\EMLID\en\Flow\Demo	1.SUP
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3. Choose the list of layers that should be considered as break lines, drawn automatically or manually, using the > button, and press OK

Layer Selection	×
Lavers Available 0 POINTS TREES	Selected Layers EXP LBD LBU LOW_SLOPE </td
	Select <
Save	Load
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4. Click OK again to generate and draw the triangulation

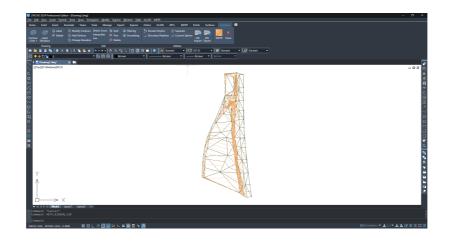


# Generating Contour Lines

- 1. Run the command MDT9 > Contour Lines/Mapping > Create Contour Lines
- 2. Setting the intervals between Minor and Major contour lines

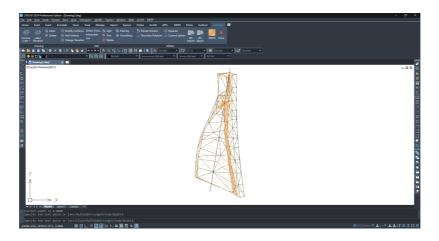
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Low	Depth 5.000
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Apply o	colors
Smoothin	ng factor: —
	Configuration
	OK Cancel Help

3. Click OK to generate the contour lines



### Creating an Alignment

1. Run the Draw > Polyline CAD command and draw an alignment that we'll use to create profiles.



2. Run MDT9 > Horizontal Alignments > Convert Polyline to Alignment and select the previous polyline

- Convert to Alignment
   X

   Name
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   Length:
   153.751

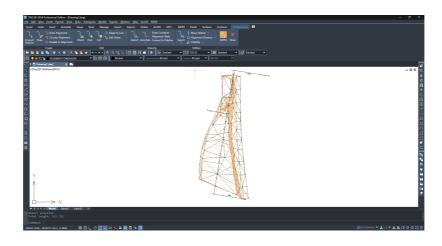
   Instruction
   80.000

   Category
   Generic road

   Insert curves between lines
   Radius

   Export In file
   Annotate Alignment

   OK
   Cancel
- 3. Enable the Annotate Alignment option and click OK two times



#### **Creating Profiles**

- 1. Run MDT9 > Long Sections > Create Long Section, and select the alignment created in the previous step
- 2. In the dialog, leave all options by default and press OK

Profile		×
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File E:\\2024\EM	ILID\en\Flow\Aliq	inment1.LON
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3. Choose the appropriate values for Horizontal Scale and Vertical Scale. In the Vertices to Represent frame, choose Constant and set an interval.

Draw Simple Long Section		×
File	File: Alignment1.LON	Additional terrains
Drawing	Numerical data	Options
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4. Click OK to draw the longitudinal profile in model space and choose an insertion point in a clear area of model space.

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- 5. Run MDT9 > Cross Sections > Create Cross Sections, and select the alignment again
- 6. In the dialog, set the Left and Right Profile Lengths and the Interval between sections and press OK

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7. In the dialog, choose Paper Space, Horizontal Scale, Vertical Scale and Paper Size

- ction Drawing File E:\...\en\Row\Alignment1.TRA Terrains Elements... Advanced. Configuration 
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- 8. Click OK to proceed with the drawing

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