

RoadEng[®] Creating a Skewed Section Example

In this example we will demonstrate how to create a skewed cross section view along a road corridor. To do this we will export design surfaces from Location to a Terrain (*.ter) file and then 'cut' a section through them.

This example requires RoadEng version 5.1106 or higher.

Exporting designed surfaces

- 1. Start the Location module
- 2. Choose menu File | Open, select file Alignment 1.dsn included with this example. Press Open.

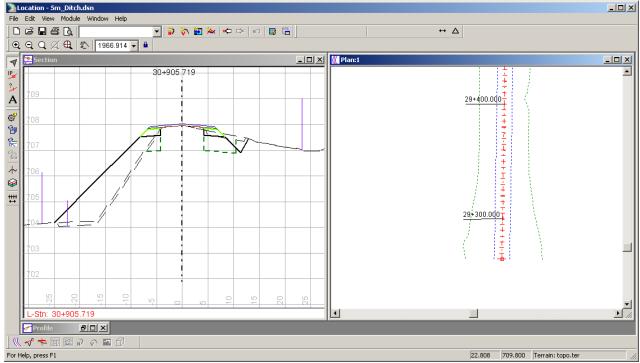


Figure 1 – Alignment 1.dsn

The template in this example has a variety of surfaces. For this example we will include the following surfaces:

- Stripping
- UC undercut
- SG subgrade
- GCB fill layer

Notice the design has reporting points at 5m spacing. This spacing will improve the accuracy of the generated surfaces and therefore the accuracy of the section.

3. Choose menu File | Save As. Select *Save as type* **Terrain File** (*.ter) and enter **Stripped.ter** as the file save name. Press *Save*.

Choose Location	design save nan	ne:					? ×
Save in:	Die T-081-Skewe	edSection		•	← 🔁	r 📰 🕈	
My Recent Documents Desktop My Documents My Computer	Conf Topo.ter						
My Network Places	File name: Save as type:	Stripped Terrain File (*.ter)			•	Save Cancel Help

Figure 2 – Location design saving to a Terrain File.

4. When the *Export to Terrain* dialog appears, set the parameters as shown in figure below. In particular, set the *Surface* to *Stripped Surface*.

Export to Terrain	×				
Station Range	To: 30905.7				
Surfaces	Section points Offset: 0.0 C From SS				
Surface limits	🔽 3D 🔽 Modelled 🔽 Breakline 🔽 Boundary				
Linear Features					
Centerline	🗖 3D 🗖 Modelled 🔽 Breakline				
Linear Features from Template Codes Add Remove					
☐ 3D ☐ Modelled ☐ Br	reakline OK Cancel				

Figure 3 – Export to Terrain options with Stripped Surface selected.

When the export completes we will have saved the Stripped surface in a terrain file.

5. Repeat steps 3 and 4 above to save surfaces:

- a. **UC.ter** (surface *SubCut*)
- b. **SG.ter** (surface *Subgrade material*)
- c. **GCB.ter** (surface *GCB*).

Creating the Skewed cross section

- 6. Choose menu Module | To Terrain to open the Terrain module 🗷
- 7. Choose menu File | Open, select file **Topo.ter** (included with this example). This is the original ground surface used in the **Alignment 1.dsn** Location design. Press *Open*.

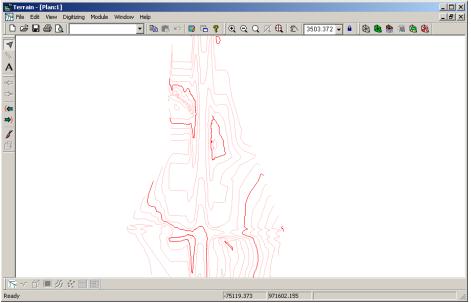


Figure 4 – **Topo.ter** viewed in the Terrain module.

We will now create a cross section. This is done in Terrain, by first creating a *draped* feature, then using this feature to create a profile.

- 8. Choose menu Edit | New Feature; this will open the *Feature properties* dialog box (figure below).
- 9. Set the feature name to "Section" (for organizational purposes) and set the properties as in the figure below (this will create a draped feature it will follow the foreground terrain surface):

eature properties		
Name: Section Displayed Connected Elevations Modelled Breakline Negative TIN Boundary Surf./Vol. Boundary	Elevations: Feature is 3D (each point has an elevation set). 3D features are used to create a TIN model provided the Modelled property is set.	Create using Mouse Keyboard Digitizer Cancel

Figure 5 – Feature Properties Dialog; properties set for a draped feature.

At this point we have the option of drawing the new feature with the *Mouse* or typing in coordinates with the *Keyboard* (we won't assume that you have a *Digitizer* connected). If you are familiar with drawing with the mouse in the Terrain module (similar to alignment editing in the Location module) then you can skip the following two steps and instead press the mouse button. Draw a two point feature similar to the one in Figure 7.

- 10. Click on the *Keyboard* button to open the *Feature coordinates* dialog box; respond *OK* to the *Draped feature outside model* warning.
- 11. Enter the coordinates as shown in the figure below:
 - a. X: -75250, Y: 971300
 - b. Press the Add button
 - c. X: -75100, Y: 971450
 - d. Press OK when complete.

				1	1		
Pt.	X	Y	Z	Comment			
1	-75250.00	971300.00	721.04				
2	-75100.00	971450.00	718.11				
							Prev
							FICV
							Next
							Add
Curre	ent Point:					Options	<u>D</u> elete
Curre	ent Point:	Х:	Y:	E	lev;		<u>D</u> elete
Curre						🗌 Surv	<u>D</u> elete
Curre	7	5250.00	971300.0		lev: .04	Curv	<u>D</u> elete ey Format ves
Curre	7		971300.0			Surv Curv Lat/I	Delete
Curre	7	5250.00	971300.0			Curv	Delete
Curre	7	5250.00	971300.0			Surv Curv Lat/I	Delete

Figure 6 – Feature Coordinates Dialog



Figure 7 – Plan Window after adding the Section Feature

12. Choose menu Window | New Window | Graphics | Profile to create a new Profile window.

NOTE: When you create a new Profile window the current feature (in this case the one created above) is used to define the view; this feature is called the *fence* feature. You can change the *fence* feature position or shape and the Profile will update.

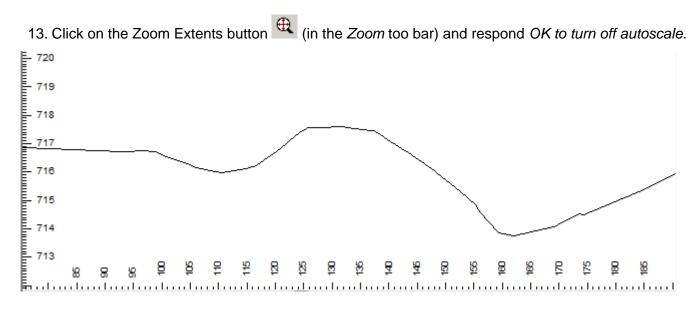


Figure 8 – Profile Window showing the draped Section feature (with vertical exaggeration).

The figure above shows a profile of the original ground surface **Topo.ter**. We will now include the additional template surfaces as *background* Terrains.

14. Right click in the Profile window and choose menu Active Window (Profile) Options.

- 15. Adjust the *Horizontal* and *Vertical* Scales to 500 and 100 respectively (as in the figure below). This will provide vertical exaggeration (if you have a large screen, you can try smaller scales).
- 16. Click on the 🖃 button beside *Background* to pop up the *Background Display files* dialog box in the figure below.

Profile Window Options		
Main: section-0 + Current		
Projected/Intersected	Background Display Files	×
Scale Horizontal: 500	stripped ter UC.ter	Add
Vertical: 100	GCB.ter GCB.ter	Remove
Auto Scale Ratio (V to H): Fixed Window Snap to point	-	Properties
Scroll Bars Snap to grid 🖃		Display Shift Up
■ Labels ± □ Tin Points		
I Grid ± I Background ±		Shift Down
	OK Cancel	
OK Cancel		

Figure 9 – Background Display Files

- 17. Press the Add button and browse for Stripped.ter; press Open to add it to the list.
- 18. Similarly, *Add* SG.ter, UC.ter, and GCB.ter (these are all the files we exported from the Location module).
- 19. (Optional) Change the formatting of the background surfaces (you can come back and do this later if you wish):
 - a. Select stripped.ter in the list.
 - b. Press the *Properties* button to pop up the *Background Display Properties* dialog.
 - c. Press the Profile Feature Format button.
 - d. Set the desired *color* and *line-type* for the stripped surface.
 - e. Press OK twice to return to the Background Display files dialog.
 - f. Repeat for SC.ter, UC.ter, and GCB.ter.

20. Press OK twice to return to the main screen.

The figure below shows the resulting skewed cross section.

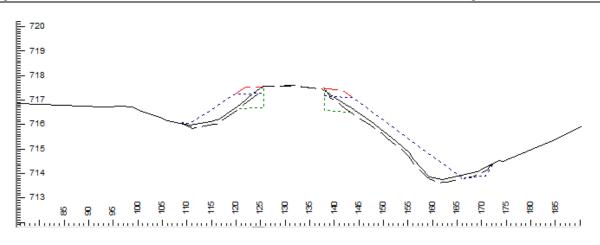


Figure 10 – Skewed cross section

Now you can create as many sections as you wish by moving the *section* feature or by creating new draped features. The following Multi-plot output shows four section features, each in it's own Profile window (procedure <u>not</u> covered in this example).

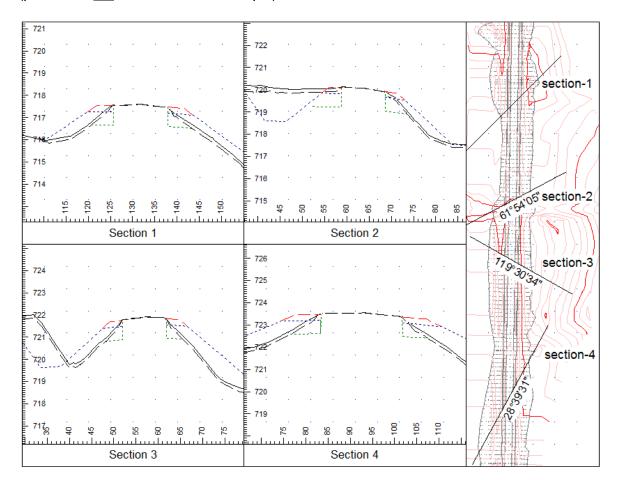


Figure 11 – Multiple sections created from the same model.

21. Choose menu File | Exit. Do not save changes.