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*.

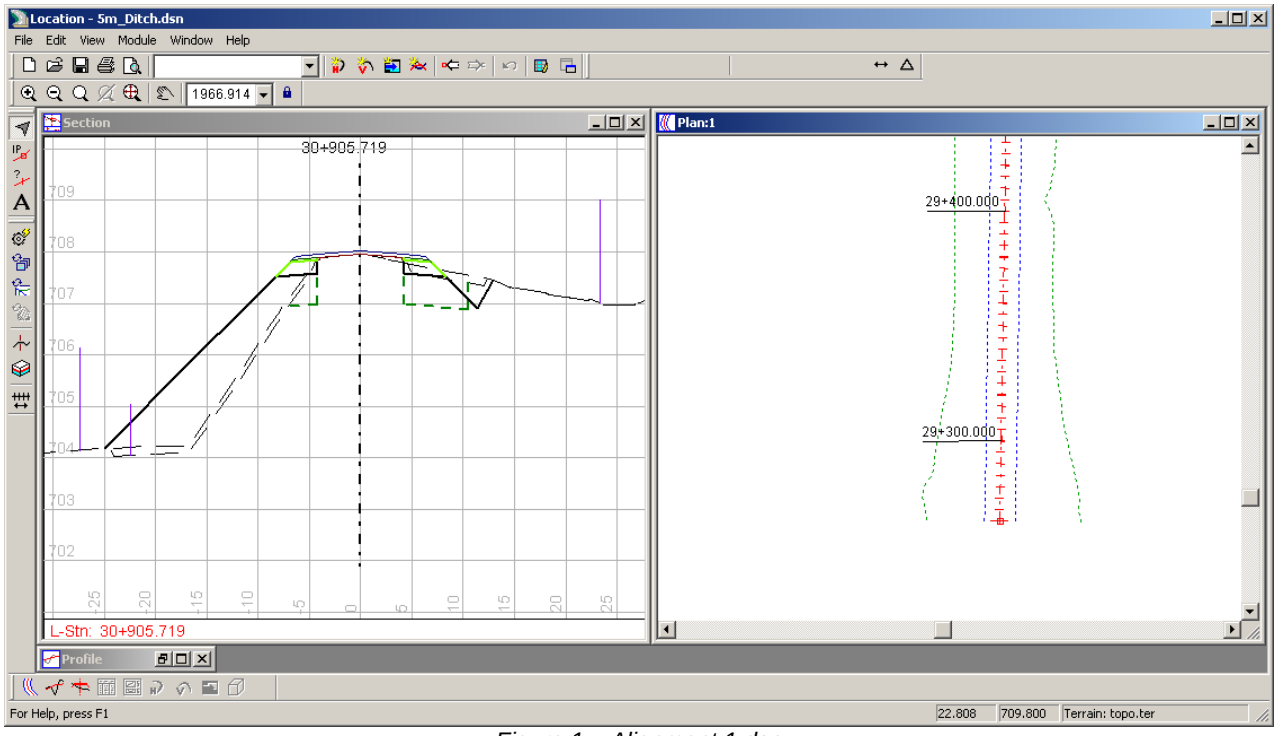

Figure 1 – Alignment 1.dsn

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*.

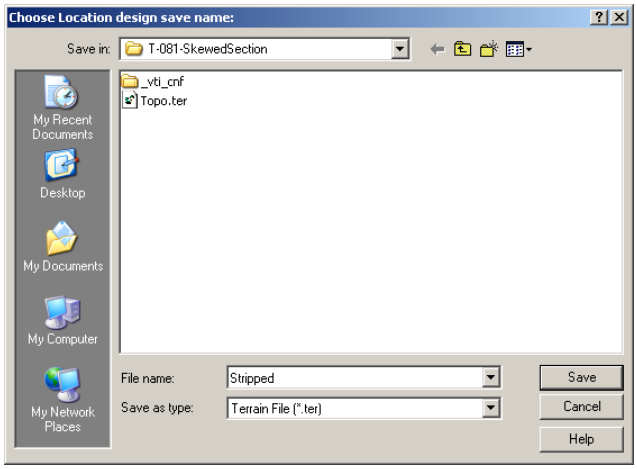

Figure 2 – Location design saving to a Terrain File*.*

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

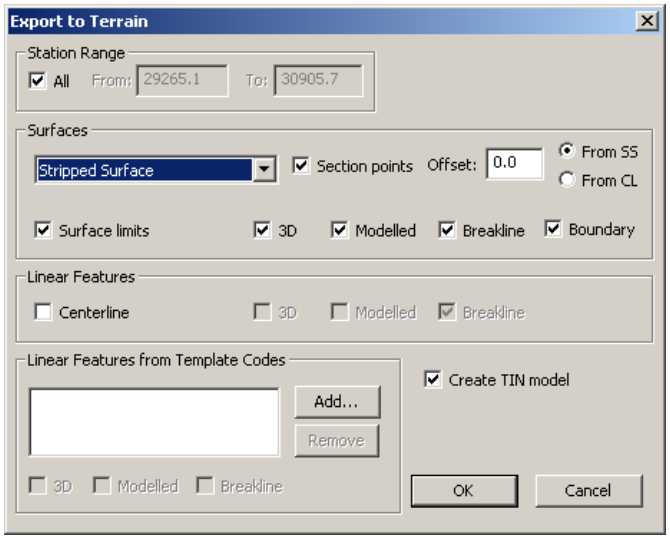

Figure 3 – Export to Terrain options with Stripped Surface *selected.*

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*.

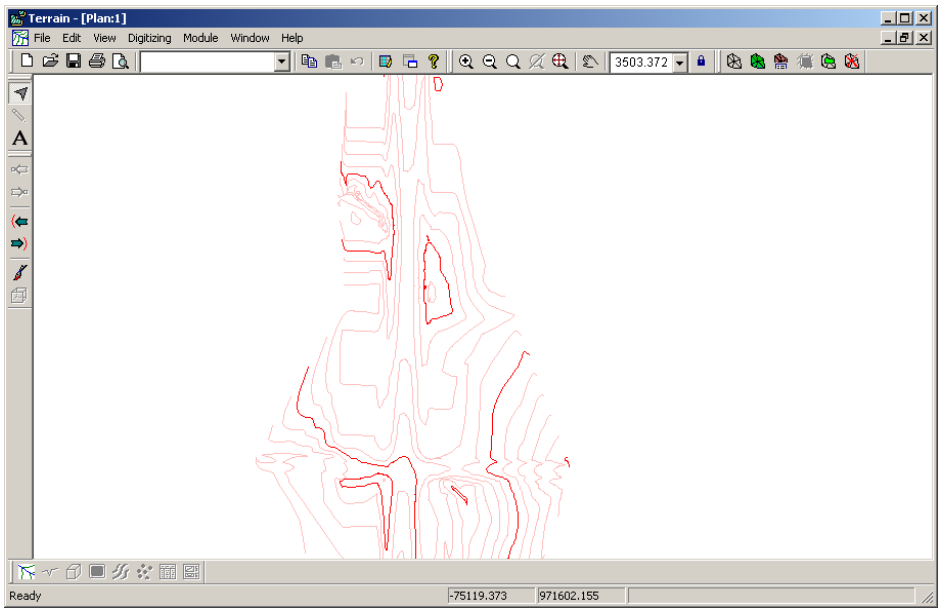

*Figure 4 – **Topo.ter** viewed in the Terrain module.*

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):

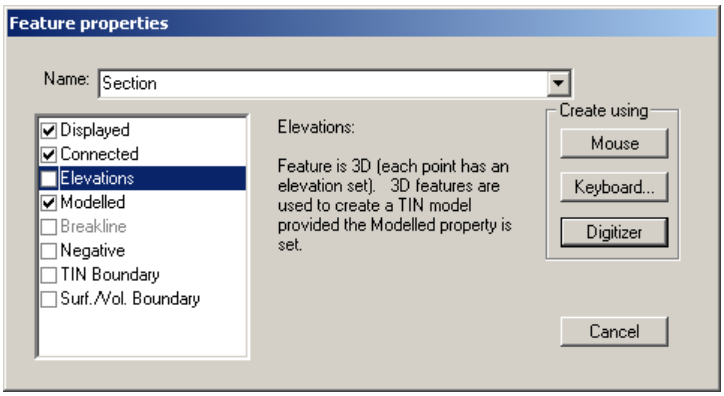

Figure 5 – Feature Properties Dialog; properties set for a draped *feature.*

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.

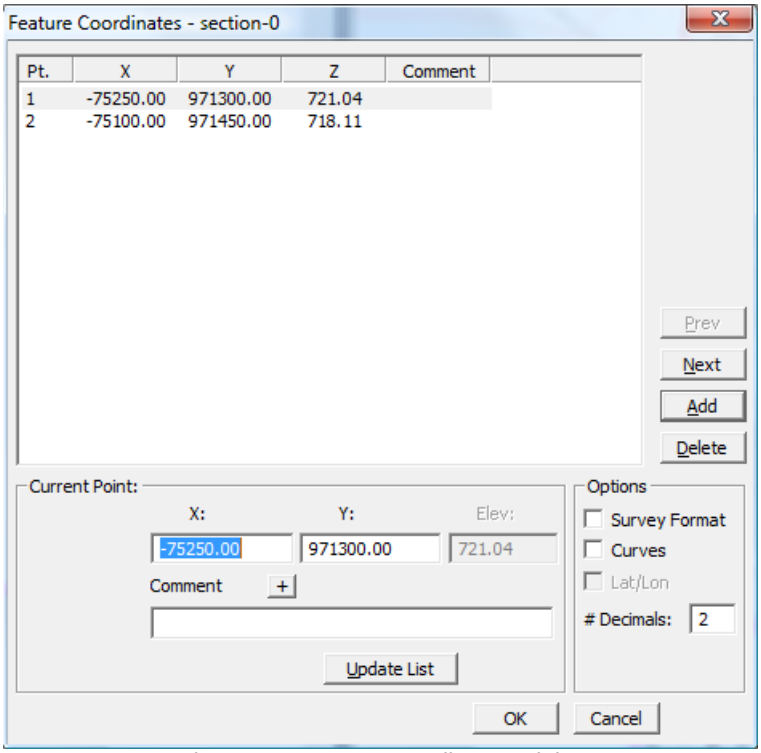

Figure 6 – Feature Coordinates Dialog

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.

13. Click on the Zoom Extents button  (in the *Zoom* too bar) and respond *OK to turn off autoscale*.

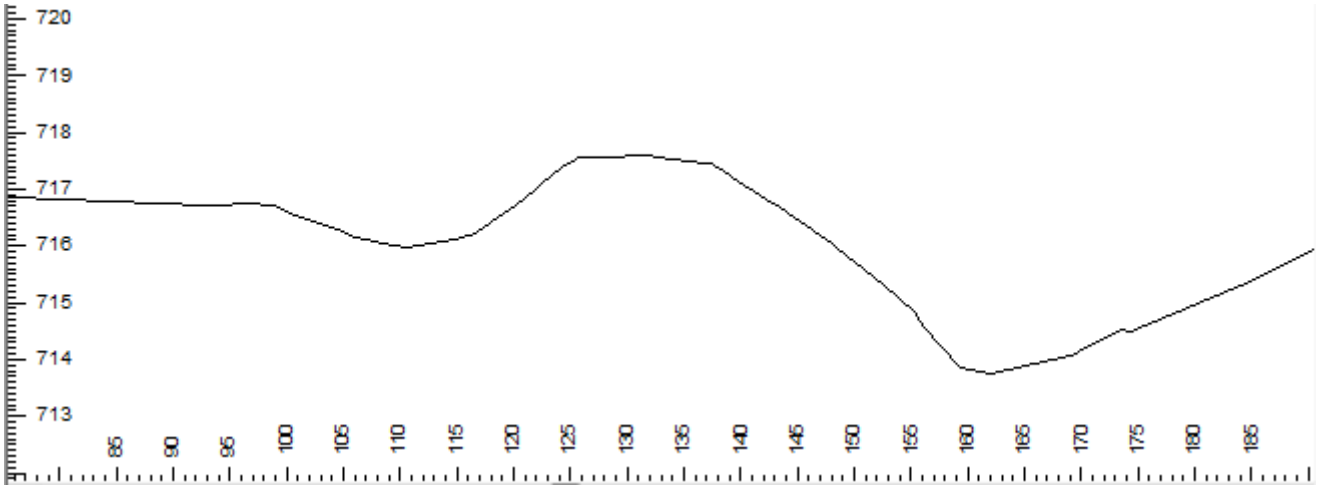

Figure 8 – Profile Window showing the draped Section feature (with vertical exaggeration).

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.

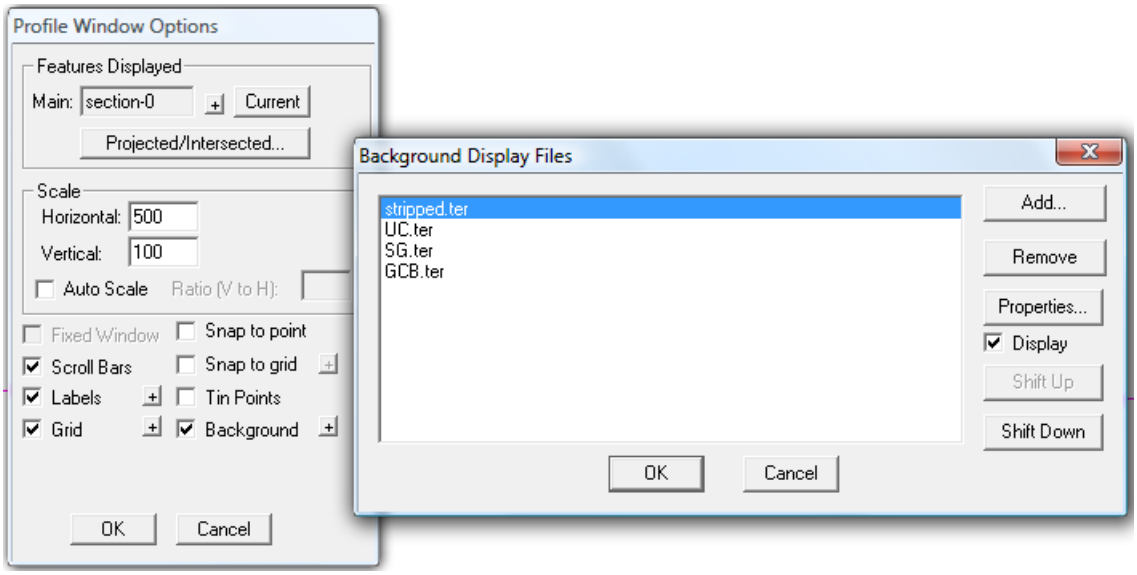

Figure 9 – Background Display Files

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.

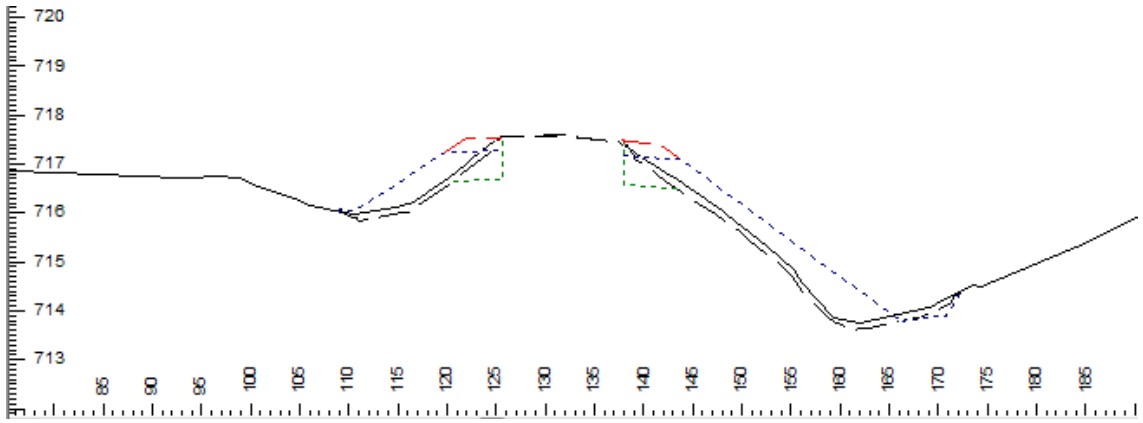

Figure 10 – Skewed cross section

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 not covered in this example).

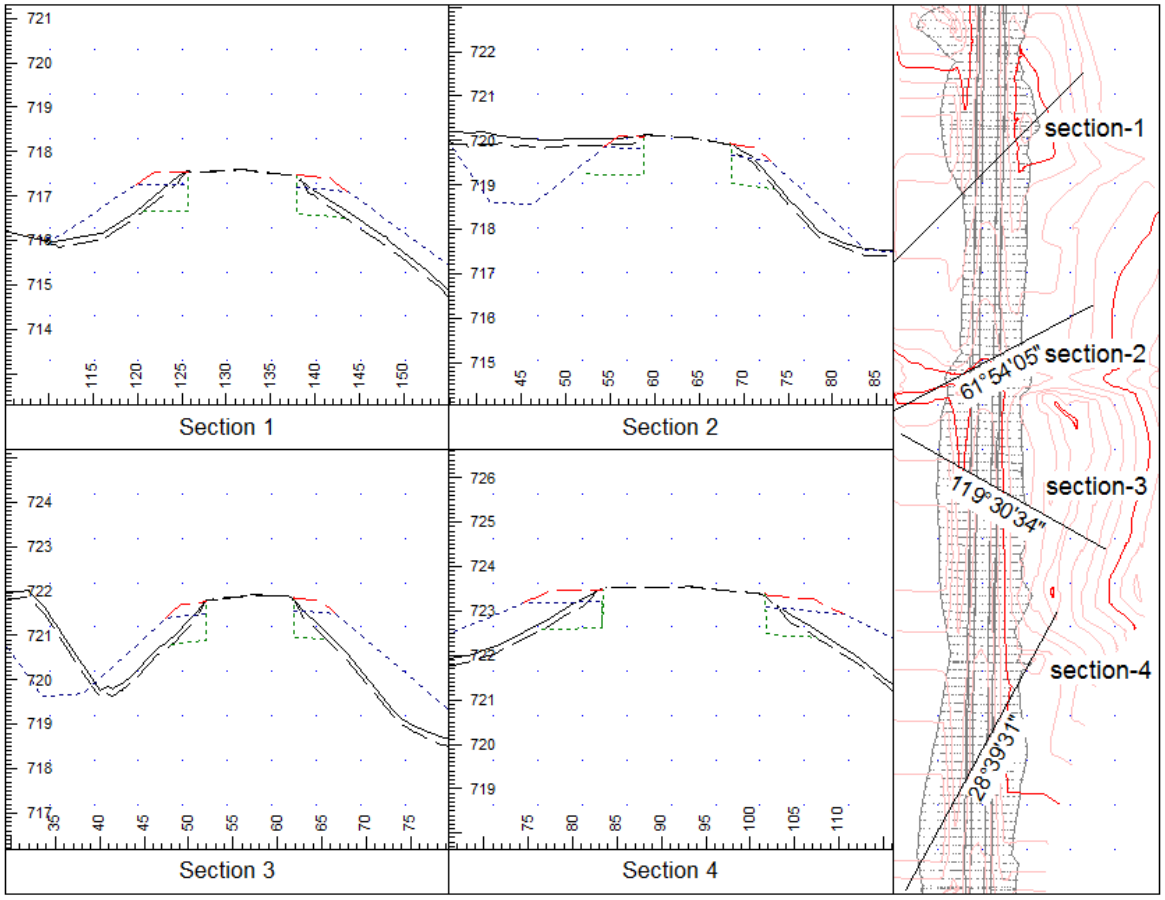

Figure 11 – Multiple sections created from the same model.

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