8. Existing Ground Cross Sections

In this exercise, we will start setting up our cross sections by first defining the locations where we want them with MicroStation lines or line strings called “pattern” lines by GEOPAK. Then we will use the Draw Cross Section tool to cut existing groundlines from our existing TIN file.

I.) Draw Patterns

1) Open the MicroStation file:

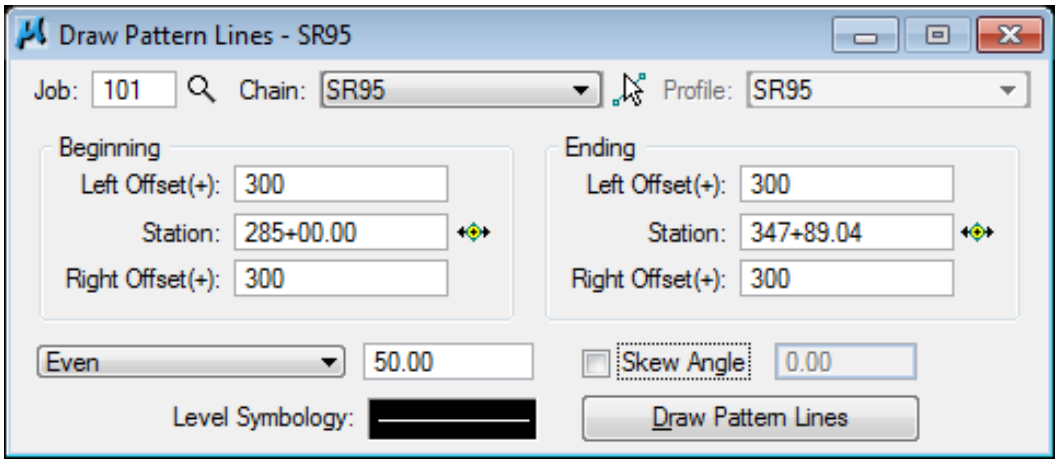
C:\Projects\Roane\SR95PoplarCr\ROSR95RoadwayPattern.dgn

Access Project Manager.

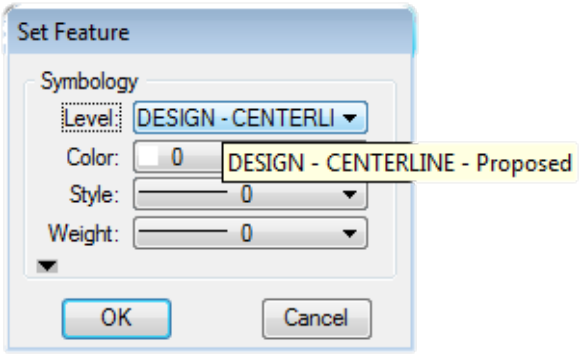
2) Select the Draw Pattern button from the Project Manager workflow dialog.

3) Create a new run called SR95.

4) Populate the dialog as depicted below. Chain name and stations are set automatically. Set the Offsets to 300 and layout option to Even at 50.



Double click on the symbology review window to make the following settings. Level name is DESIGN – CENTERLINE – Proposed. Click OK to save the settings.

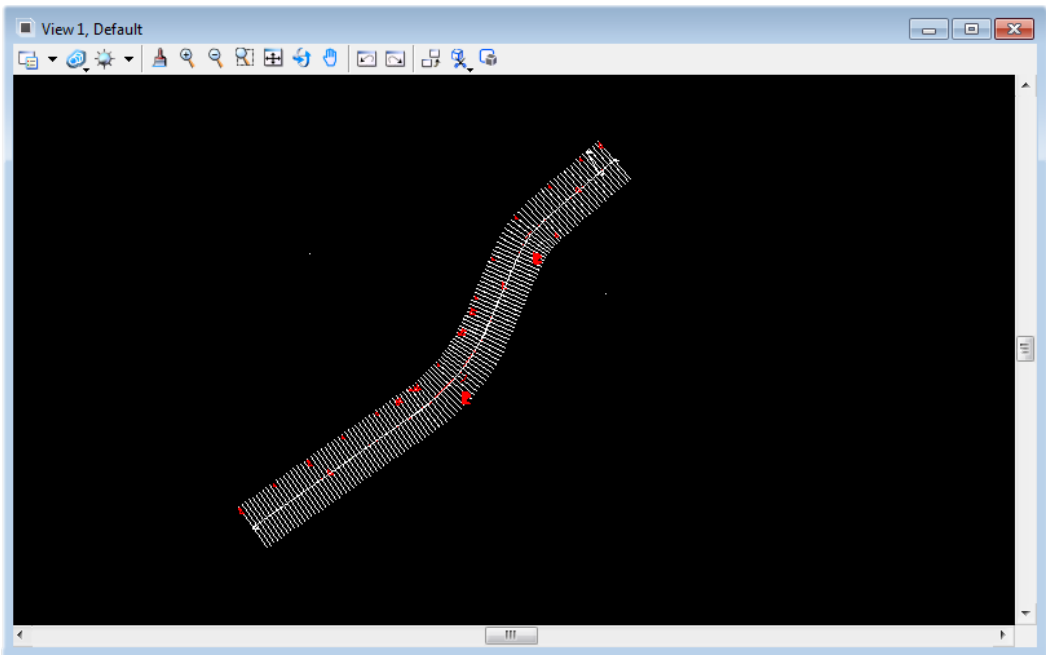


NOTE:

The symbology settings for pattern lines are not critical since they are not used in the plans. If more than one set of roadway patterns are placed in a file, it is important to make some part of their symbology different, such as the level, so that they can be recognized correctly by GEOPAK during cross section processing.

5) Press Draw Pattern Lines to initiate the plotting of the patterns into the design file.

6) Review the pattern lines in MicroStation. The alignment DGN file has already been referenced to this file and you can see the pattern lines along it.



7) Exit the Draw Pattern dialog and Save Settings for the run.

II.) Drawing Skewed Pattern Lines

Skewed pattern lines are used to cut culvert cross sections for drainage structure development. When those structures have been designed, the Pattern line tool can be used to plot the centerline for box structures or pipes at the required length.

This information is provided for reference only. Do not do this for the class. Review and then go on to Section III.

1) From Project Manager or the GEOPAK Road tool frame activate the Draw Pattern tool.

2) Set the job number and chain name for the roadway.

3) Change the placement control at the bottom for placement Once and change symbology settings as desired.

NOTE:
When drawing pipes, the required symbology should be set using proposed pipe items from D&C Manager with Place Influence active so that quantities can be calculated later...

4) Only the Beginning side of the dialog should be active now and there you now can set the Offset LT, Station & Offset RT.

5) If the drainage structure is at 90 degrees (0 degrees on dialog) you can go ahead and hit Draw Pattern Lines to draw the pattern line for the structure. If the structure is skewed click on the Skew Angle option.

6) Enter the Skew value. Skew values in this dialog are measured from a normal 90 degree line not the centerline as we normally consider them. So to get the skew value to enter in the dialog, subtract the skew from 90.

Skews to the left should be entered as positive and skews to the right as negative. (Example: 60 degree skew left is 90-60=30)

7) Hit Draw Pattern Lines to draw the structure centerline or pipe.

III.) Generate Existing Ground Cross Sections

1) Open the MicroStation file

C:\Projects\Roane\SR95PoplarCr\ROSR95MainlineXSections.dgn

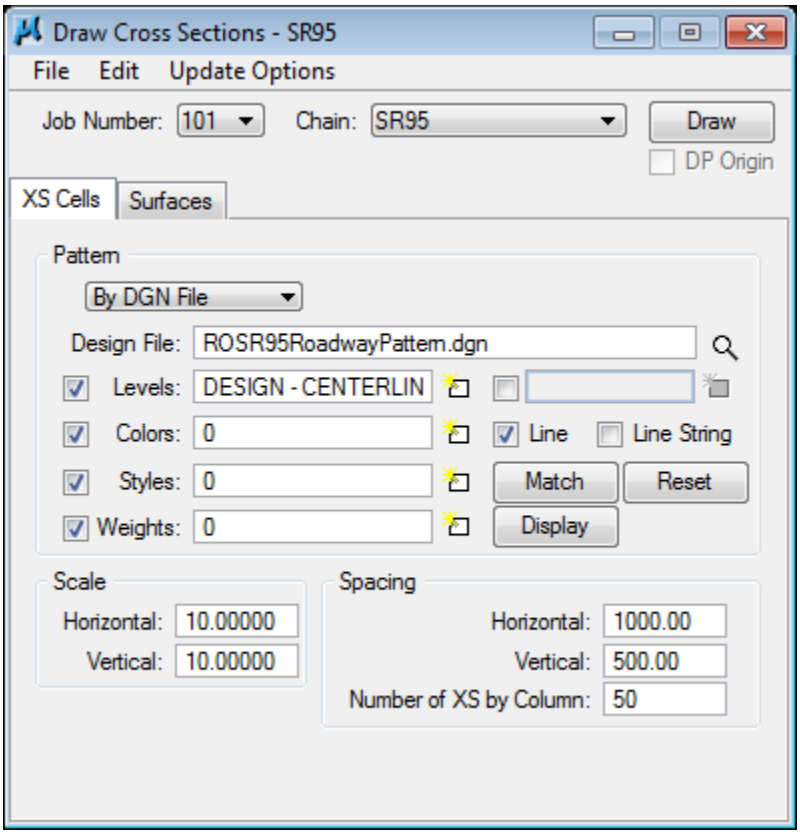
NOTE:
When creating a new cross sections design file, always use the seed file SeedXS.dgn. This file has special settings which are different from the normal seed2d.dgn DGN seed file. This is required for proposed cross section processing and if not used can generate errors and fail to build proposed sections.

2) Press the Existing Ground Cross Sections button on the Project Manager dialog.

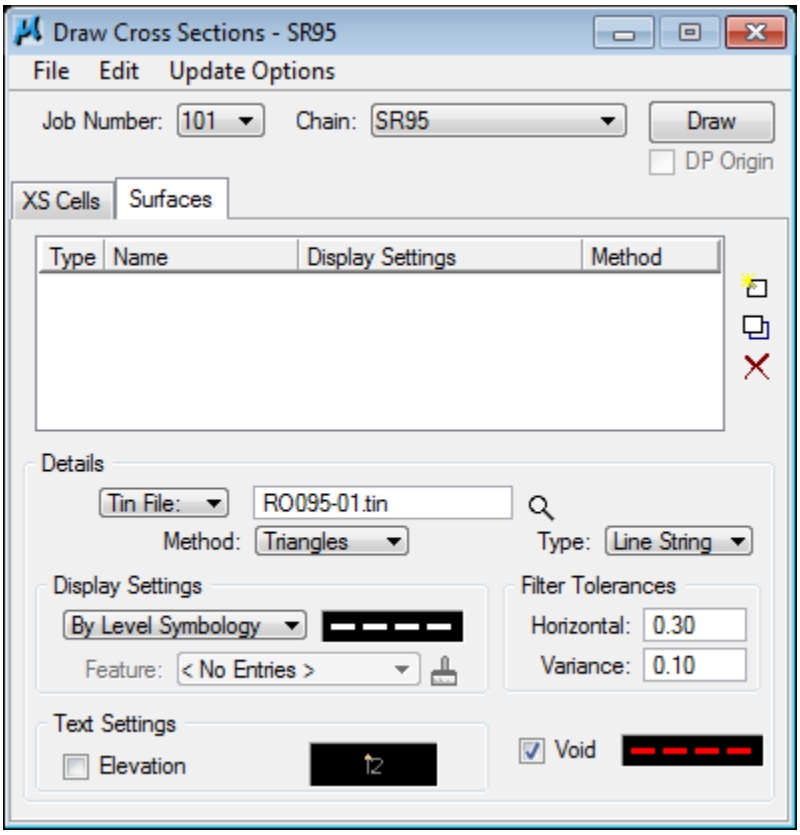
3) Create a run called SR95.

4) Set up the existing ground cross-sections by populating the dialog as shown.

Start by changing the XS Cells option to By DGN File which will change the items shown in the dialog. Pattern line symbology should be set as we did in the previous section.

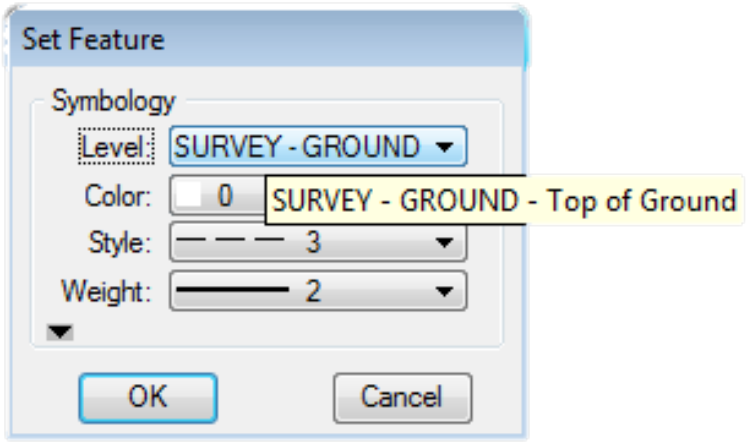


Click on the Surfaces tab to open this dialog display. Make the settings in the lower portion first. Double click on the symbology review windows to set the symbology for groundlines and voids as shown below this dialog.

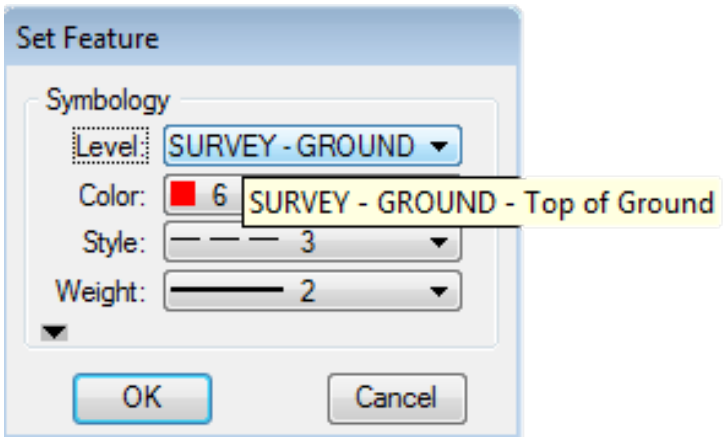


Void symbology is the same as groundlines except for the color which is red (6). Level name is SURVEY - GROUND - Top of Ground.

Display Settings



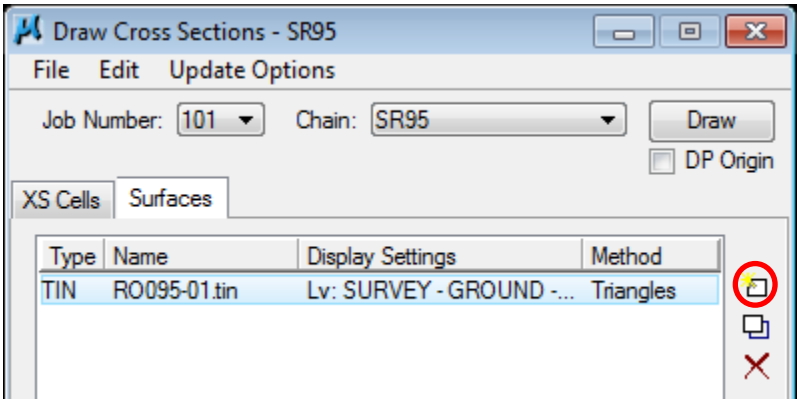
Void



NOTE:

It is critical for plotting purposes that Line Strings always be used for groundline displays. When lines are used with line code 3, short pieces of line will appear solid on plots making them difficult to see on gridded cross section sheets.

5) When the settings in the lower portion are complete click the Add Surface button on the side.



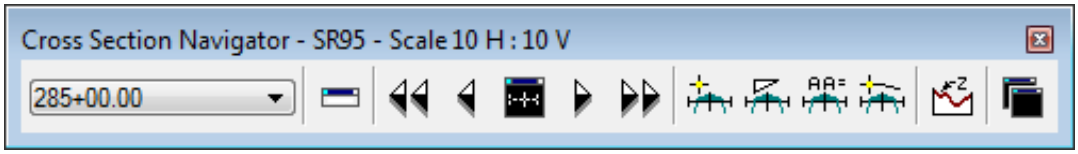
6) Next, press the Draw button to place the cross section graphics.

7) Exit the dialog and Save Settings for the run.

IV.) Review Cross Sections

1) Open the Road Tools task group and select the Cross Section Navigator tool from the cross section tools.

2) Use the Cross Section Navigator to browse and check your existing cross sections.



3) **Exit** the XS Navigator dialog when done.

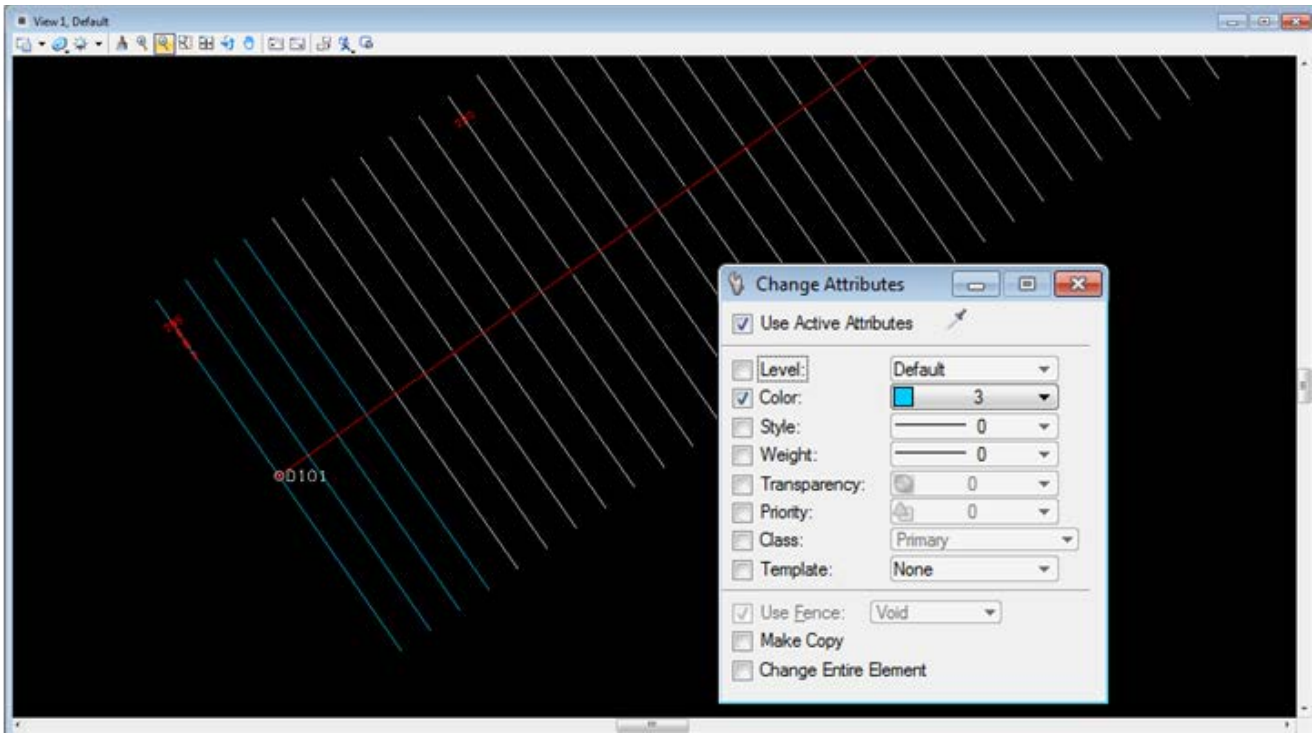
V.) Modify Pattern Line Symbology

In preparation for the following exercise, complete this step:

1) Re-open the MicroStation file

D:\Projects\Roane\SR95PoplarCr\ROSR95RoadwayPattern.dgn

Utilizing the MicroStation Change Element Attributes command, modify the color of the pattern lines drawn at stations 285+00 through 286+50 and station 347+89.04 to **color = 3**. This will limit the processing of the proposed cross sections to the station range of the proposed roadway profile (287+00 to 347+50).

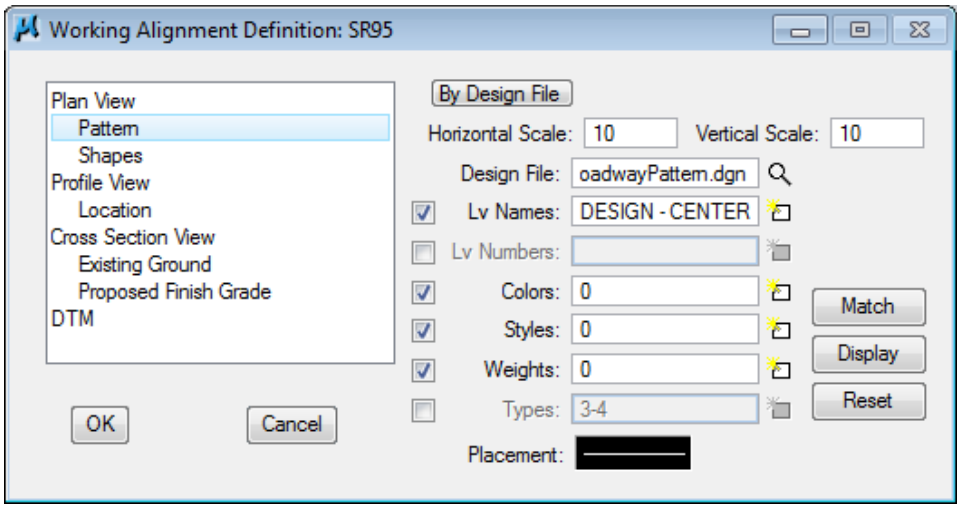


VI.) Working Alignment - Define Patterns & Cross Sections

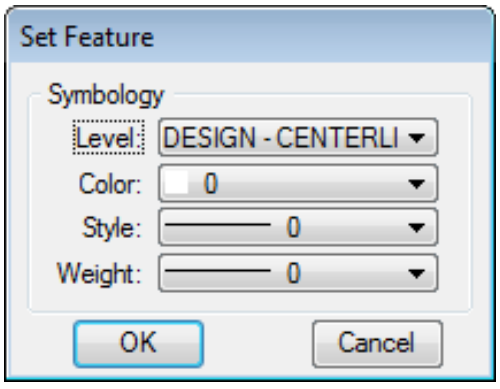
We are completing the Pattern, Cross Section and Existing Ground sections of the Working Alignment Definition in Project Manager.

1) From the workflow dialog of Project Manager, press the Define button.

2) Highlight the Pattern option and populate the dialog as depicted below. Since we are in the pattern file, you can use the Match button to accomplish this task rather than manually typing in the information, click the button and data point on one of the white pattern lines to set. These symbology settings control searches for cross section patterns by other tools



3) Double click on the symbology review window next to Placement at the bottom and set the same values in the Set Feature dialog. This symbology control will be used if pattern lines have to be placed again for this roadway.



4) Click OK to save the symbology settings and OK again on the main dialog to save the Pattern settings.

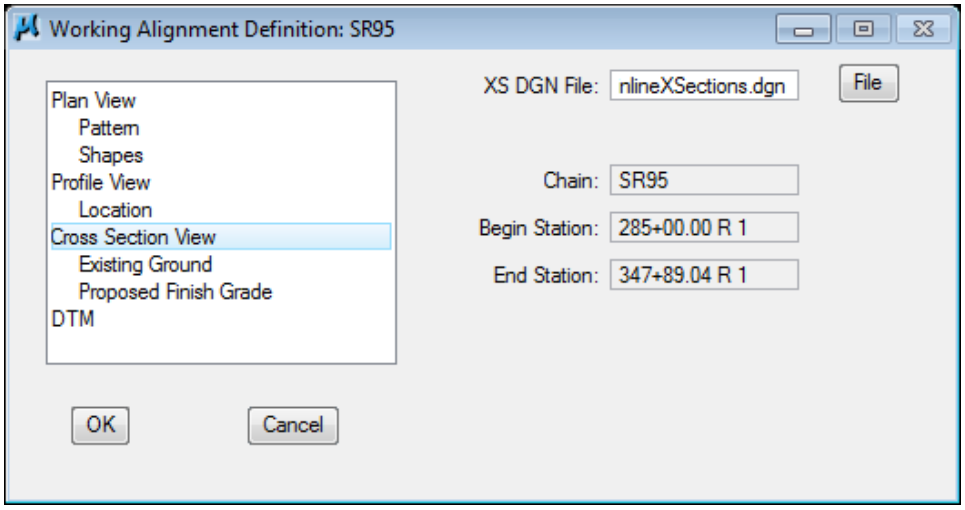
5) Open the MicroStation file

C:\Projects\Roane\SR95PoplarCr\ROSR95MainlineXSections.dgn

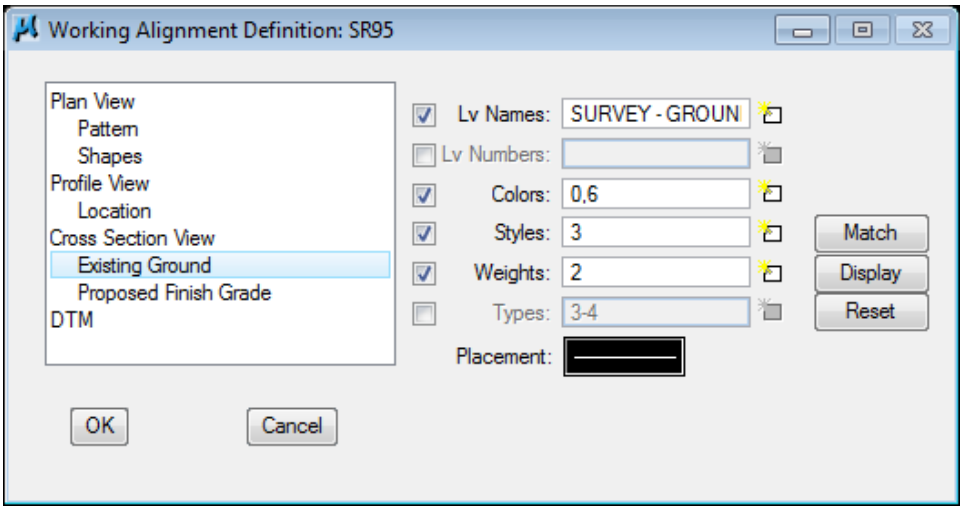
6) Use Cross Section Navigator to go to your first cross section.

7) From the workflow dialog of Project Manager, press the Define button.

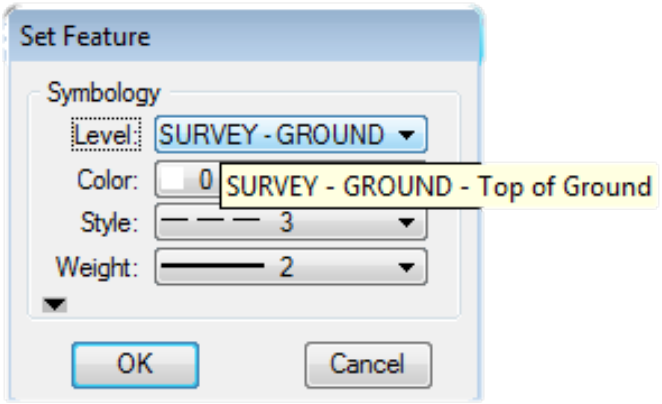
8) Highlight the Cross Section View option and using the File button identify the roadway cross section file. Notice that chain & station limits are read from the file.



9) Highlight the Existing Ground option and populate the dialog as depicted below. Use the Match button and identify the groundline. For possible Void areas add the color 6 as shown.



10) Double click on the symbology review window next to Placement at the bottom and set the same values in the Set Feature dialog (use color 0).



11) Click OK to save the symbology settings and OK again on the main dialog to save all of the Cross Section and Existing Ground settings.