Private Drive Profile Production

**This will not take care of all driveways. Drives with possible slope encroachments, are in extreme cuts or fills or need more complex vertical alignments will need to be processed using regular roadway design functions.**

Horizontal Layout

Step 1.   Create two new DGN files, **PvtDrPatterns.dgn** & **PvtDrProfiles.dgn,** one for patterns from DGN seed file **Seed2D.dgn** and one for profiles from seed file **SeedXS.dgn.**

Step 2.   In **PvtDrPatterns.dgn** set up centerlines for private drives to be used as pattern lines with Geopak cross section tools. These must be lines or line strings. Use a different color,etc for left and right so that they can be processed separately later.

Straight Pvt. Drives:
Any line drawing tool can be used but one suggested tool to get this done is Microstation's **Construct Line at Active Angle** with an angle of **90 degrees** and method set **To Point**.
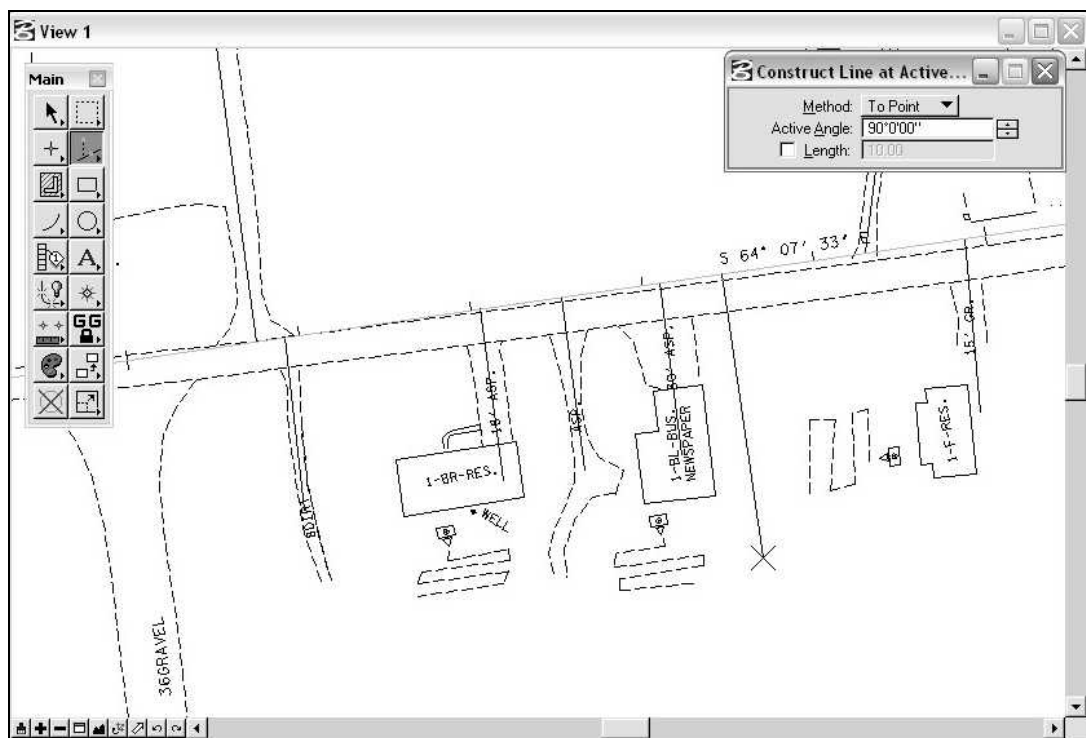
Private Drives with curves:
For drives with curves use Microstation's **Smart Line** set to **Rounded** for the initial layout. Then since the pattern line must be a line string change the settings for this tool to **Sharp** and **Joined** and trace the initial layout snapping to the ends of the tangents and curve(s) . Then use Microstation's **Insert Vertex** tool to wrap the line string around the curve(s).

Step 3. Finalize pattern lines.

Un-divided Roadways: To ensure that the correct superelevation is applied on these roadways when superelevation shapes are present, it will be necessary to extend the pattern line to **completely** cross the superelevation shapes. When processed this will produce some lines on the opposite side of the roadway which will have to be deleted. If no superelevation shapes are present use Microstation's **Extend Line by Distance** with distance set to **0.1** to extend pattern lines past the centerline to ensure capture by cross section tools.

Divided Roadways: Since the superelevation shape clusters for these roadways are set up separately on each side of the roadway it is not necessary to extend them to the other side of the road. To finalize these pattern lines use Microstation's **Extend Line by Distance** with distance set to **0.1** to extend pattern lines past the centerline to ensure capture by cross section tools.

Step 4. Go to your project's **Proposed.dgn** file (specified by "**PLAN DGN**" in prop. cross section run) and reference the file **PvtDrPatterns.dgn** so that you can see your proposed driveway pattern lines..

Step 5. Access Geopak's **D & C Manager** and go to **Drafting Standards\ Private Drives**. At the bottom of this section you will see the three types of tie point symbologies.
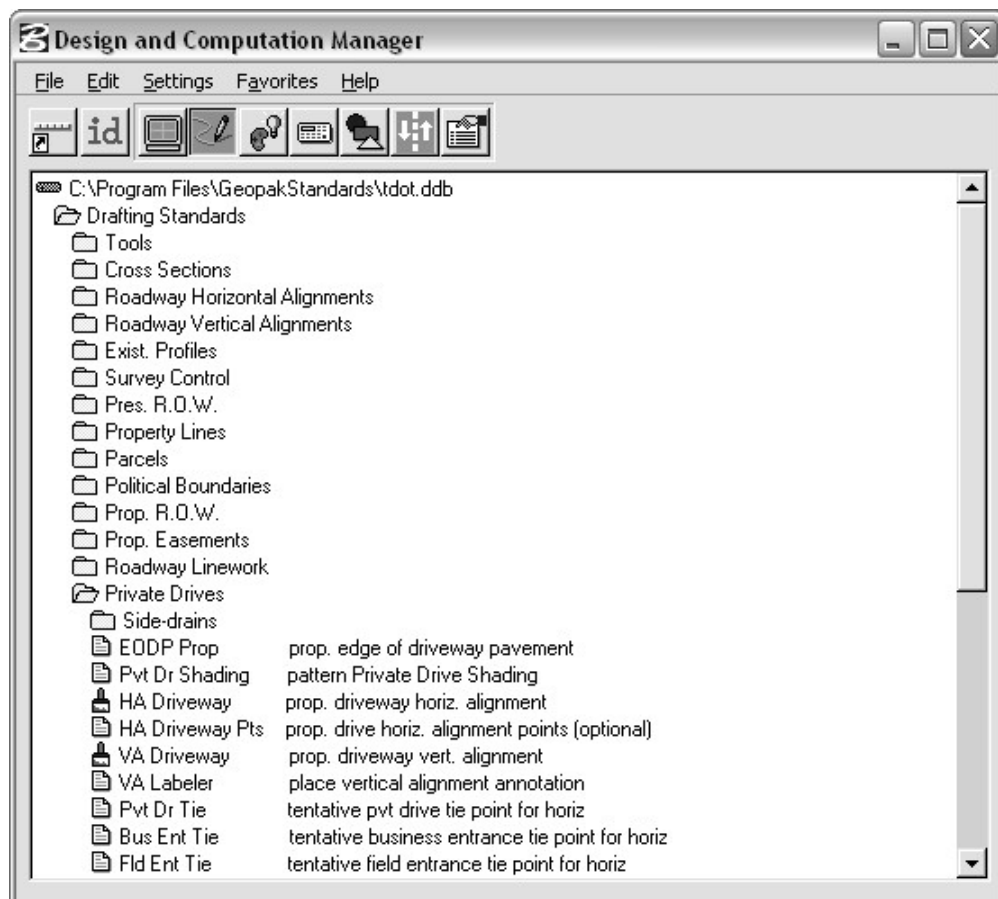
Step 6. In **Proposed.dgn** draw lines across the pattern lines at the location needed to tie back to the existing drive horizontally. Use the D&C items to set symbology to correspond to **Pvt dr, Bus Ent** or **Fld Ent**.
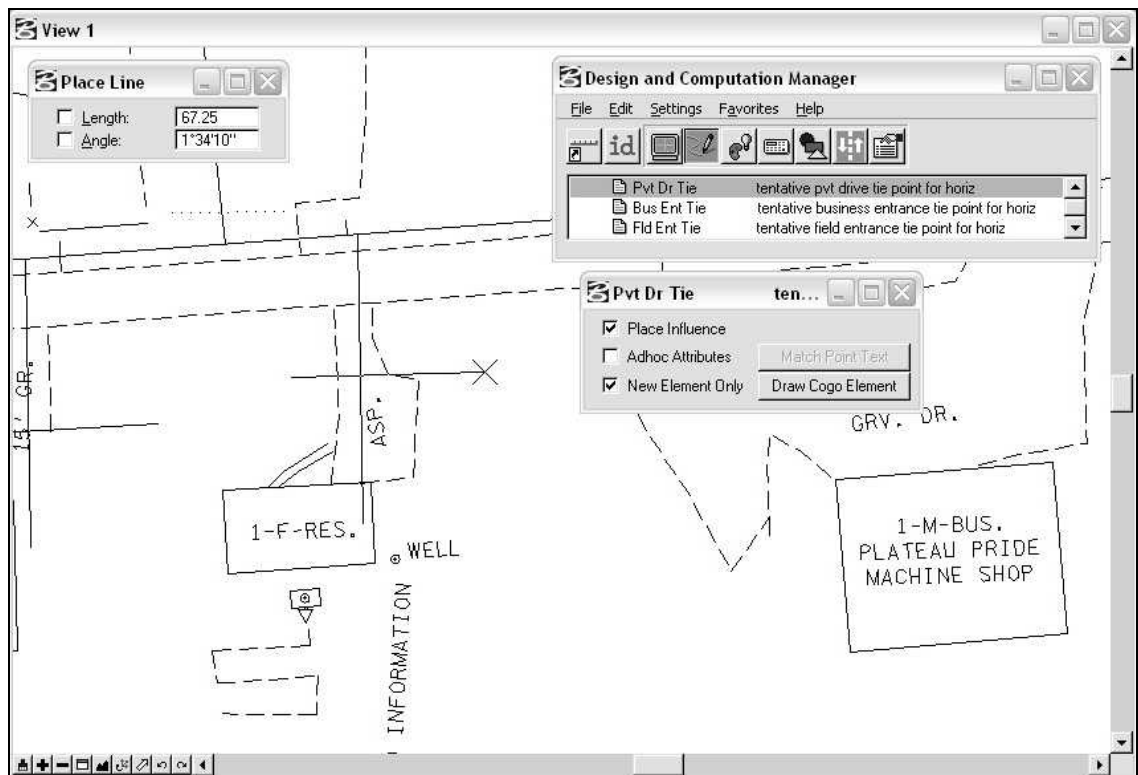
The location of these lines will be used to start the proposed vertical alignment design for the drive and the type used will control labeling as well as the maximum grade allowed.

Geopak Working Alignment Set-up

Step 1. Copy the Working Alignment definition for the roadway which the drives come from twice, once to use for driveways on the Right & one for the ones on the Left.
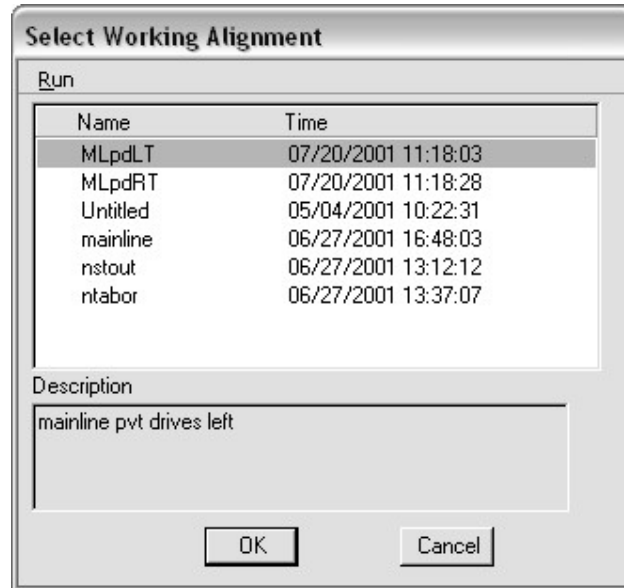
Step 2. Activate the working alignment definition for the left private drives by highlighting it and clicking **OK**.
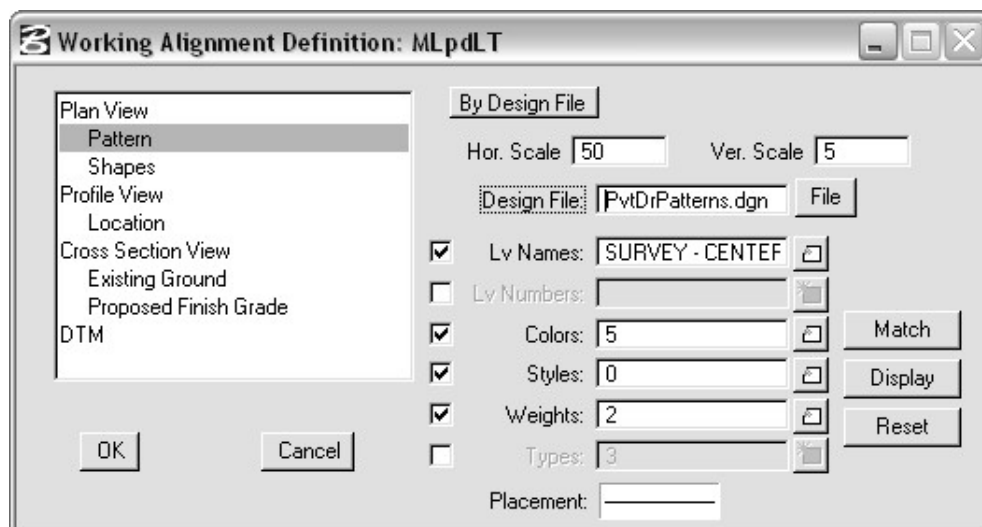
Step 3. Click on the **Define** button for working alignments. Access the **Pattern** dialog update the settings for the left private drives.
Hor. Scale   50
Ver. Scale   5
Design File   PvtDrPatterns.dgn
Set search criteria to match the ones used for your left pattern lines

Step 4. Repeat steps 2 & 3 to set up the working alignment for private drives to the **right** of the centerline with the exception of the pattern line search symbology which should match whatever was used for the right side in step 2 of **Horizontal Layout**.

Existing Groundline Profile Cuts

Step 1.   Activate the working alignment definition for the **left** private drives.

Step 2.   Open the Microstation file **PvtDrProfiles.dgn**. Access the **Project Manager Road** work flow dialog and click on **Existing Ground Cross Sections. C**reate a new run for private drives. Most settings are automatically made from entries in the working alignment definition. Add pattern line symbology from right side of roadway so that booth Left & Right groundlines can be cut at the same time.

Make sure **Type** under **Surfaces** is set to **Line String** and check symbologies for exist. ground and void areas by double clicking on symbology view windows.

Normally for 10 scale cross sections we use defaults for **Spacing**. For 50 scale profile cuts set **Vertical: 1000** and **Number of XS by Column: 25** to ensure adequate room for each profile.
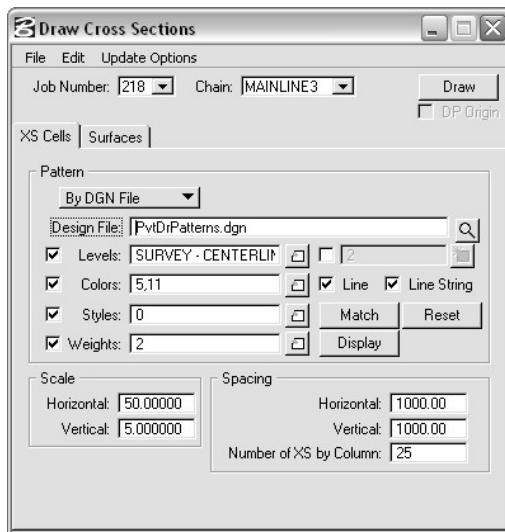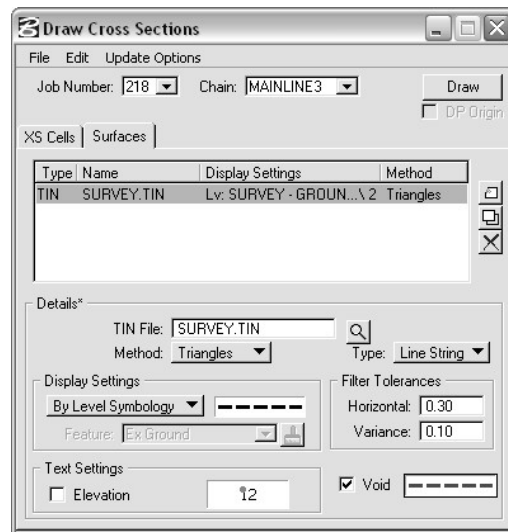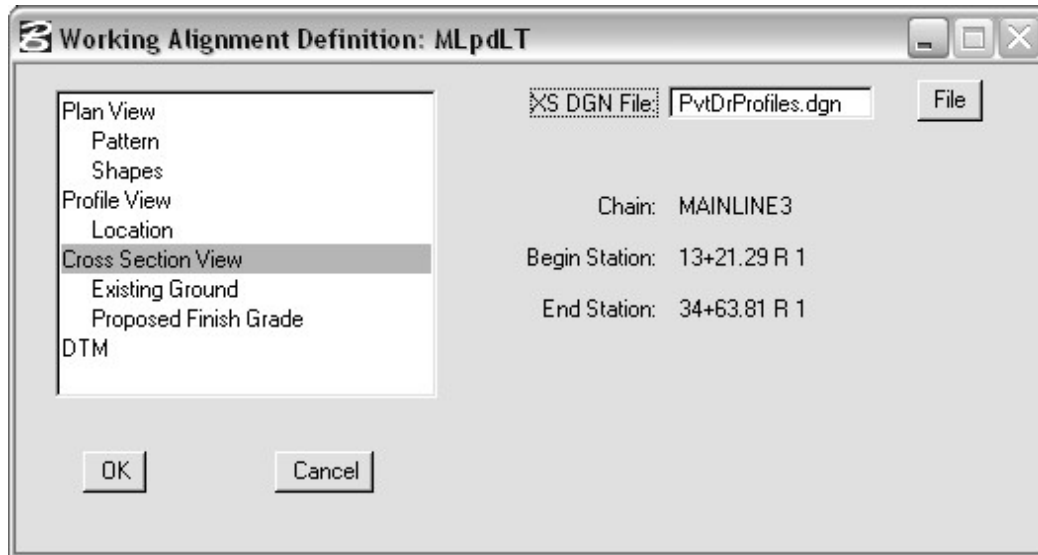

Exist. Ground   Void

Existing ground and Void lines are placed on level **SURVEY - GROUND - Top of Ground**.

When all settings are made click on **Draw**.

Step 4. Finish setting up the working alignment for the **left** side. Click on the **Define** button for working alignments. Access the **Cross Section View** dialog and set the filename to **PvtDrProfiles.dgn**.

Step 5. If **right** private drives were not cut at same time as the left repeat steps 1 & 2 to cut right groundlines. By using special symbologies for pattern lines additional new drives can be added to **PvtDrProfiles.dgn** at a later time**.**

Step 6. Finish setting up the working alignment for the **right** side. Activate the working alignment definition for the **right** private drives. Click on the **Define** button for working alignments. Access the **Cross Section View** dialog and set the filename to **PvtDrProfiles.dgn**.

Left Proposed Private Drive Profiles

Step 1. Activate the working alignment definition for the **left** private drives .

Step 2. Open the Microstation file **PvtDrProfiles.dgn**. Access the **Project Manager Road** work flow dialog and click on **Proposed Cross Sections.** Copy the proposed cross section run for the roadway the driveways come off of . You can go ahead and make two copies, one to use for driveways on the Left & one for the ones on the Right. These runs are processed separately so that un-wanted graphics on the opposite side of the road are not produced.

Step 3. Open the left private drive cross section/profile run from **Proposed Cross Sections.**

Step 4. Settings for XS DGN File, Pattern, Existing Ground & Shapes should be already set from the working alignment definition so click on **Shape Clusters** and make the following changes depending on your roadway typical section:

For roadways with one shape cluster such as a 2 lane crown roadway
            Delete all **RT side slope conditions**

For roadways with two roadway cluster such as a 4 lane depressed median roadway
            Delete all **RT roadway clusters (NOT RT side slope conditions)**

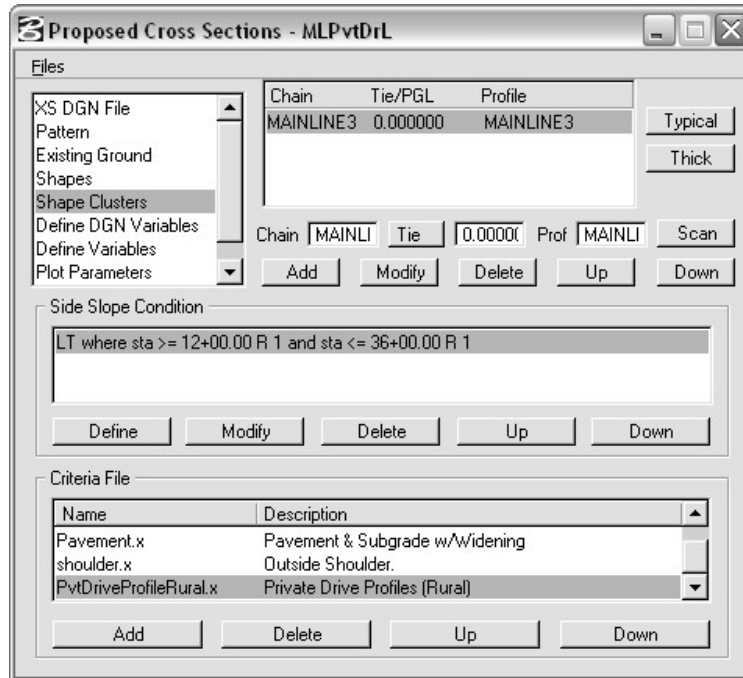This example illustrates a roadway with one roadway cluster
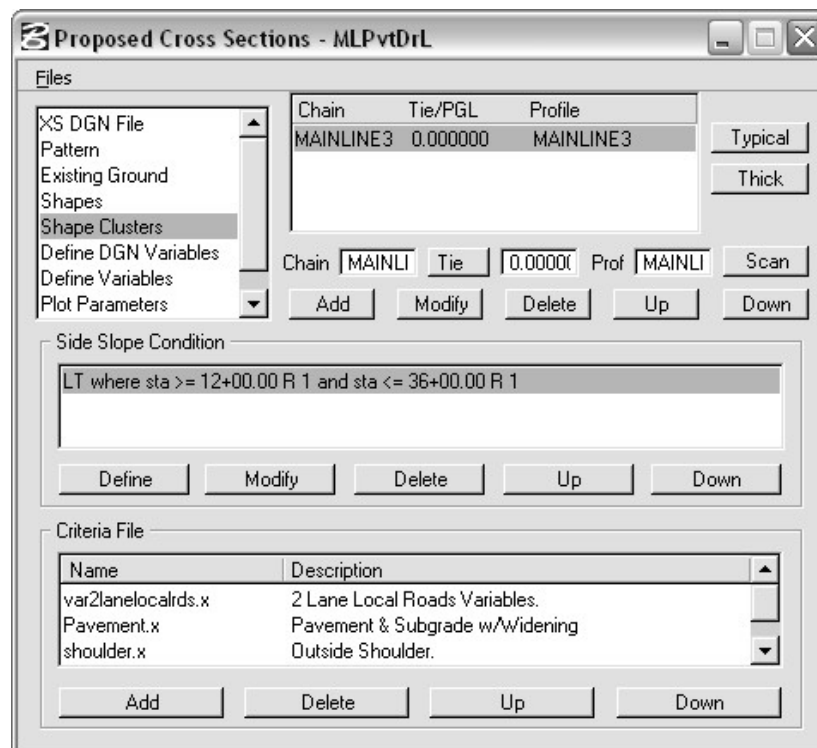
Step 5. Click on each remaining **LT Side Slope Condition** and under **Criteria File**

For Rural Roadways:
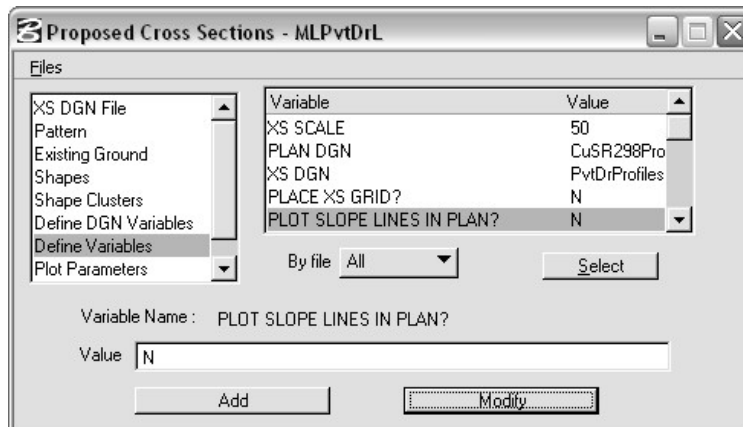Delete **Case*slopes.X** file and add **PvtDrProfileRural.x** to replace it.

For Urban Roadways:
Delete **C&G6in.x, SidewalkAreaLeft.x & Case*slopesC&G.X** files and add **PvtDrProfileUrban.x** to replace them.

Step 6. In the **Define Variables** dialog of **Proposed Cross Sections** reset the following:
XS Scale	**50**
XS DGN	**PvtDrProfiles.dgn**
Place XS Grid?	**N**
Plot Slope Lines in Plan?	**N**.

Go to the bottom of the **Define Variables** list and observe the profile design controls. Set these as needed for your roadway or use defaults. It is recommended that defaults be used in most cases for the first run. Driveways which cannot meet normal design controls can be re-run later by themselves with different settings for these controls.
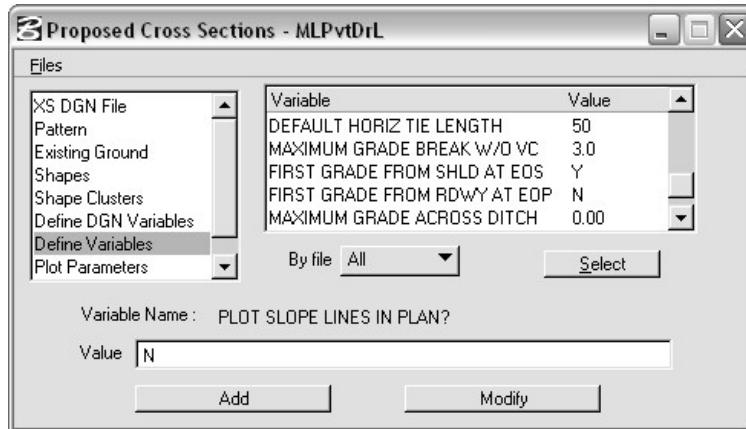
These design controls include

For Rural Roadways:
"Default Horiz Tie Length" 50
"Maximum Grade Break w/o VC" 3.0
"First Grade from Shld at EOS" Y
"First Grade from Rdwy at EOP" N
"Maximum Grade across Ditch" 0
"Maximum Residential Grade" 15.00
"Maximum Business Grade" 8.00
"Minimum VC Length" 10
"Maximum VC Length" 30
"Crest K Value" 1
"Sag K Value" 2

For Urban Roadways
"Default Horiz Tie Length" 50
"Maximum Grade Break w/o VC" 3.0
"Beginnning Grade" 0
"Maximum Residential Grade" 15.00
"Maximum Business Grade" 8.00
"Minimum VC Length" 10
"Maximum VC Length" 30
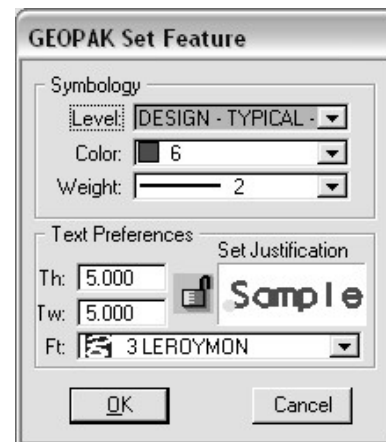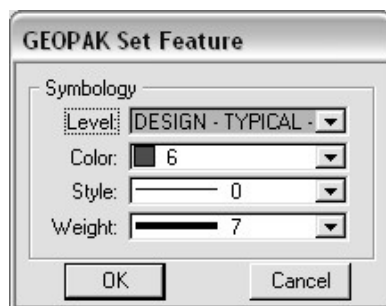**"Crest K Value" 1**
"Sag K Value" 2

Note: **Default Horiz Tie Length** is only used if no tie point lines are placed in step 6 of Horizontal Layout.

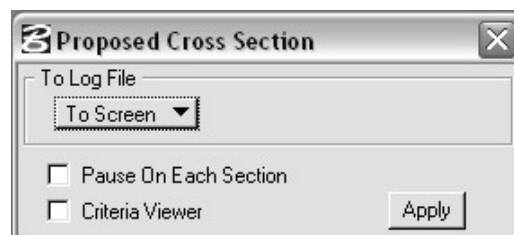**Step 7.** In the **Plot Parameters** dialog of **Proposed Cross Sections** make the following changes:.
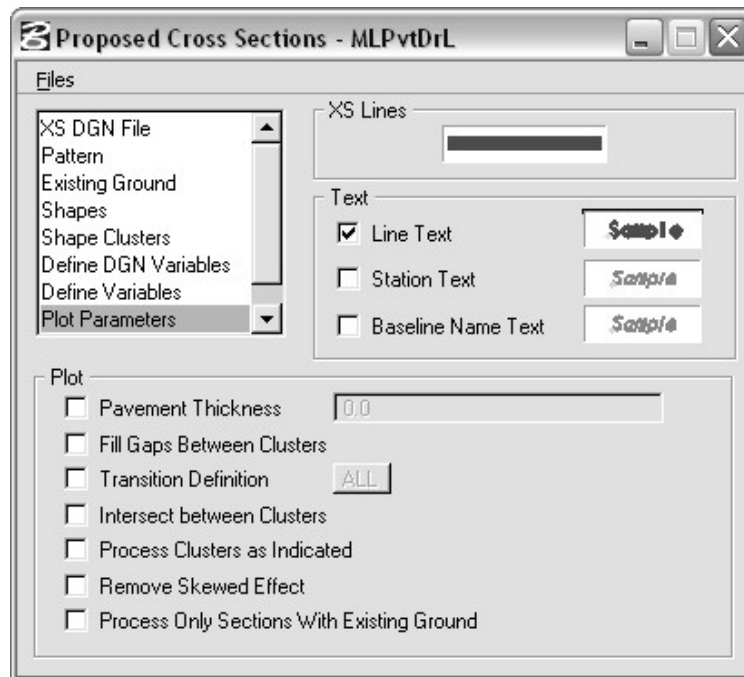
Set weight of **XS Lines** to **7** to match normal profile weights

Set **Line Text** to **Th=5 Tw=5**. and justification to **left bottom**

Step 8. No other changes need to be done to the run so go to the drop down option **Files>Run** on the **Proposed Cross Sections** dialog and hit **Apply**.

On **divided roadways** ignore the error message concerning pattern lines which do not cross all superelevation shapes. This error is given if any of your pattern lines end at the centerline. On **un-divided roadways** you should extend your pattern lines to cross all superelevation shapes as specified in **Step 3** and then re-run the profiles.
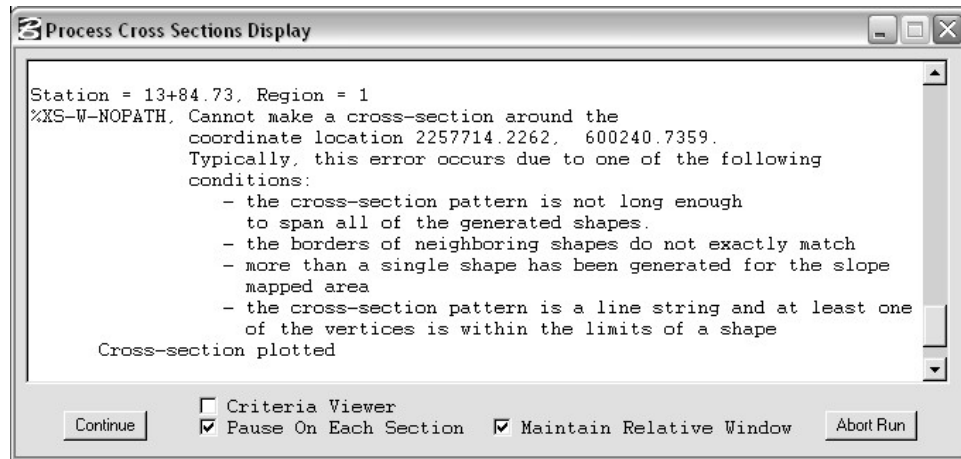
Step 9. Using Geopak's **Cross Section Navigator** review all left profiles.
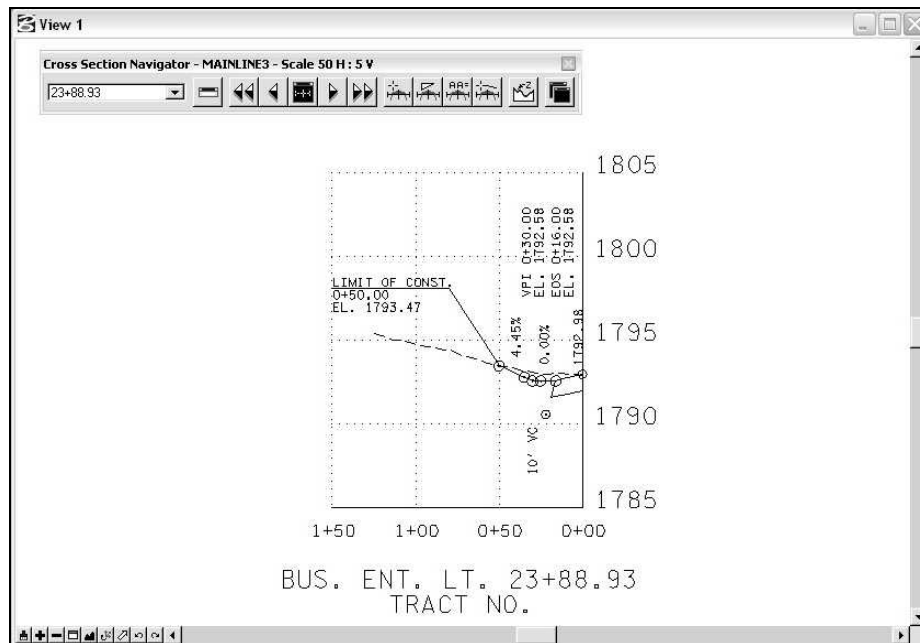
Check for errors	**Check for warnings**
Insufficient groundline	Default Length Used For Initial Tie
Connecting Grade exceeded Max	Tie Point Shifted
Unfixable Overlapping Vertical Curves	Beginnining VC Length exceeded Max
No Valid Design could be found	Ending VC Length exceeded Max
	Exist. Tie Grade exceeded Max

The private drive profile criteria only allows the **…Grade exceeded Max** error on the final existing tie grade. The program will try for proposed grades which match design control limits and will move out groundline searching for a better design. This may result in the **Insufficient groundline** error. Moving the drive location, adjusting design controls or extending the centerline/groundline may solve these problems.

If you get the **Tie Point Shifted** warning which means the tie point has been shifted from the original requested location, check the new limit of construction in the **PLAN DGN** file to make sure that the new location is OK horizontally. The limit of construction pavement line and private drive label flags are placed in PLAN DGN at the appropriate symbologies.

If no valid design can be found only error messages are displayed.
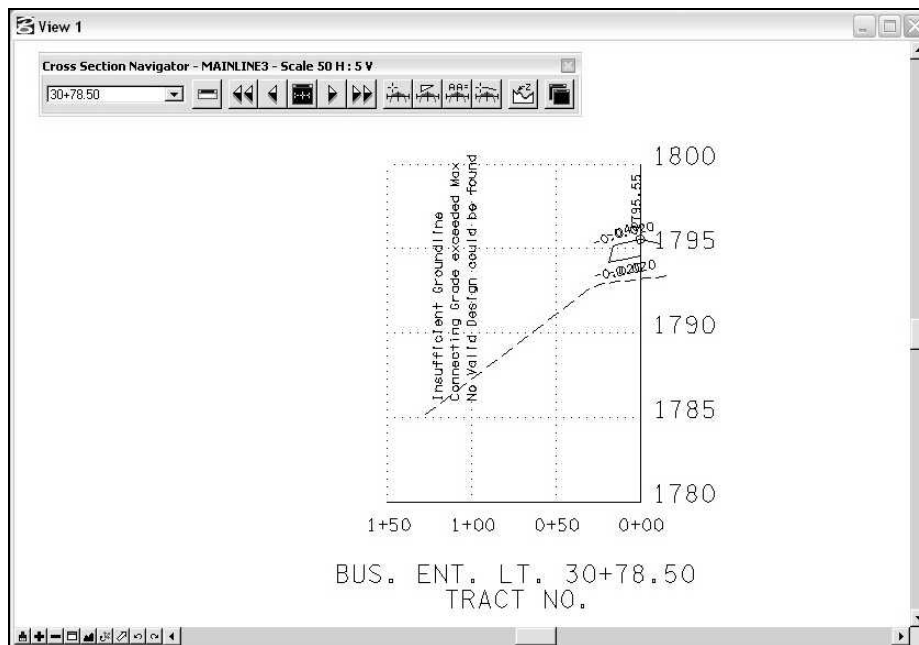
Step 10. Make changes as needed and re-run left profiles. The pattern line color for specific drives can be changed and by changing search criteria in the working alignment re-run those drives only.

WARNING
When exiting the cross section run be sure and click **Yes** to save changes made to it.

Right Proposed Private Drive Profiles

Step 1.　　Activate the working alignment definition for the **right** private drives .

Step 2.　　Open the Microstation file **PvtDrProfiles.dgn**. Access the **Project Manager Road** work flow dialog and click on **Proposed Cross Sections.** If not done previously then copy the proposed cross section run for the roadway the driveways come off of for the drivways on the Right.

Step 3.　　Open the **right** private drive cross section/profile run from **Proposed Cross Sections.**

Step 4.　　Settings for XS DGN File, Pattern, Existing Ground & Shapes should be already set from the working alignment definition so click on **Shape Clusters** and make the following changes depending on your roadway typical section:

　　　　WARNING…Make a note of which Var*.x file is used at the beginning of the criteria file list on the left. You will need to add this file back in on the right later.

　　　　For roadways with one shape cluster such as a 2 lane crown roadway
　　　　　　　Delete all **LT side slope conditions**

　　　　For roadways with two roadway cluster such as a 4 lane depressed median roadway
　　　　　　　Delete all **LT roadway clusters (NOT LT side slope conditions)**

　　　　This example illustrates an urban roadway with one roadway cluster
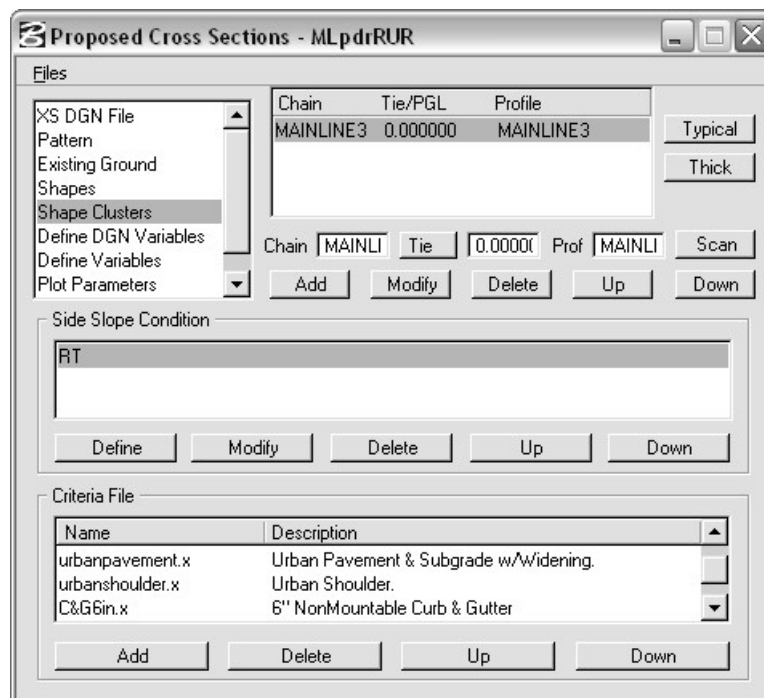
Step 5.   Click on each remaining **RT Side Slope Condition** and under **Criteria File**

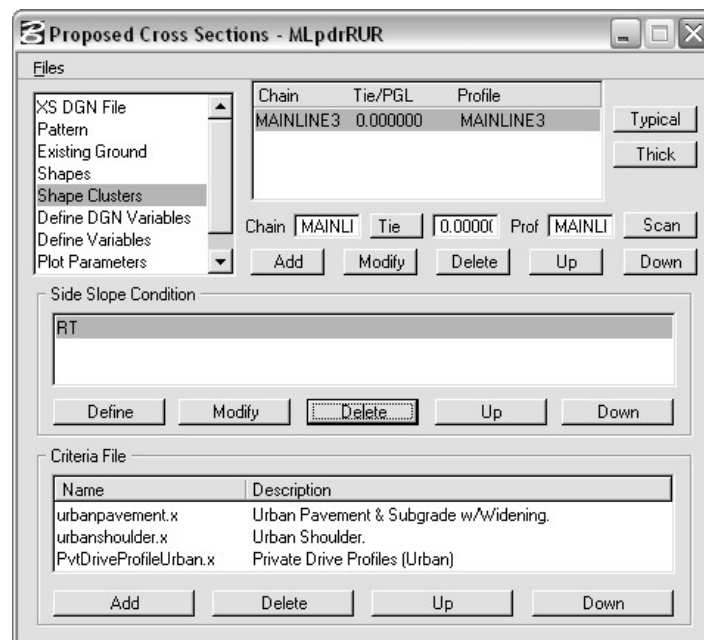Add the **Var*.x** file noted before deleting the left and move to the top of the file list.
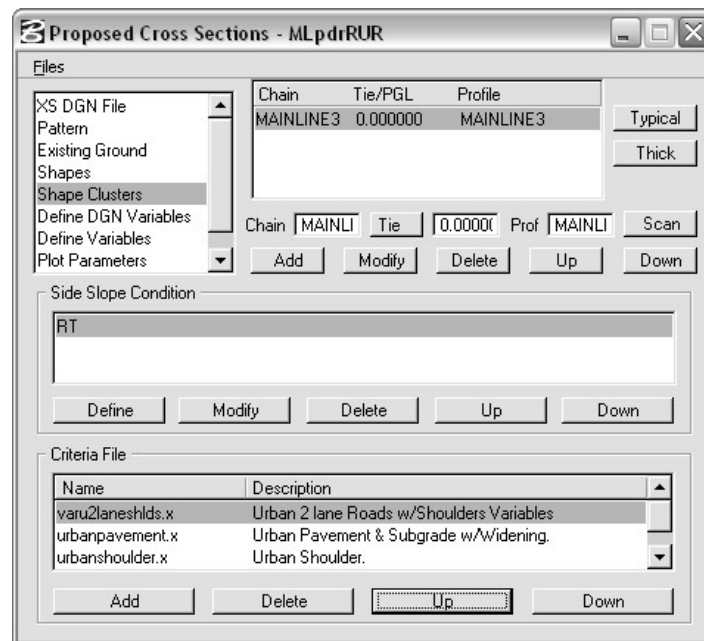

For Rural Roadways:
Delete **Case*slopes.X** file and add **PvtDrProfileRural.x** to replace it.

For Urban Roadways:
Delete **C&G6in.x, SidewalkAreaRight.x & Case*slopesC&G.X** files and add **PvtDrProfileUrban.x** to replace them.

Step 6. Go to the bottom of the **Define Variables** list and observe the profile design controls. Set these as needed for your roadway or use defaults. See **Step 6** under **Left Proposed Vertical Alignments** for a list of these controls.

Step 7. In the **Plot Parameters** dialog of **Proposed Cross Sections** make the following changes
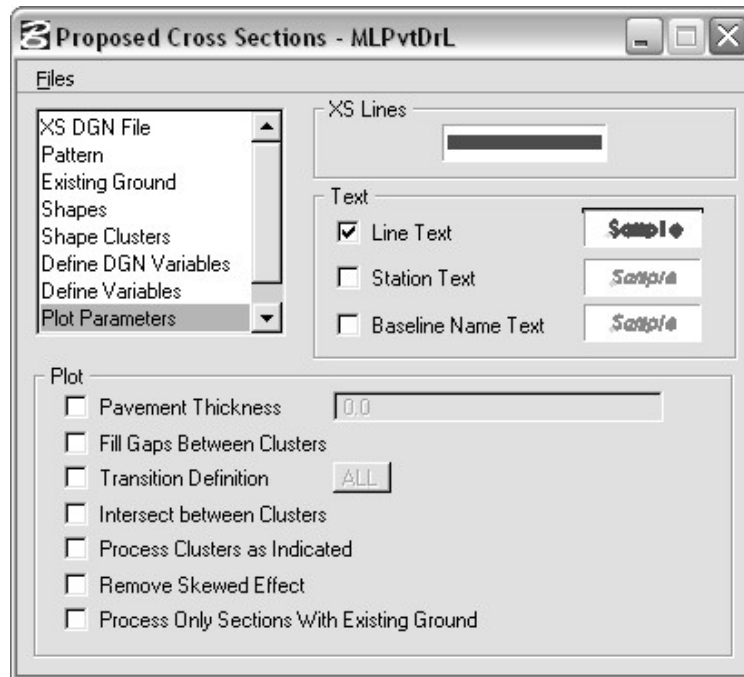
Set weight of **XS Lines** to **7** to match normal profile weights

Set **Line Text** to **Th=5 Tw=5**. and justification to **left top**
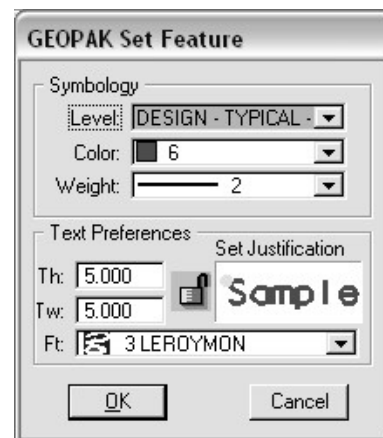
Step 8. No other changes need to be done to the run so go to the drop down option **Files>Run** on the **Proposed Cross Sections** dialog and hit **Apply** to process right profiles.

Step 9. Using Geopak's **Cross Section Navigator** review all right profiles. Refer to instructions under **Left Proposed Vertical Alignments** for trouble shooting errors.

Step 10. Make changes as needed and re-run right profiles. The pattern line color for specific drives can be changed and by changing search criteria in the working alignment re-run those drives only.

WARNING
When exiting the cross section run be sure and click **Yes** to save changes made to it.