Exercise 4-1

This is a group exercise to present several GEOPAK Digital Terrain Modeling (DTM) tools.

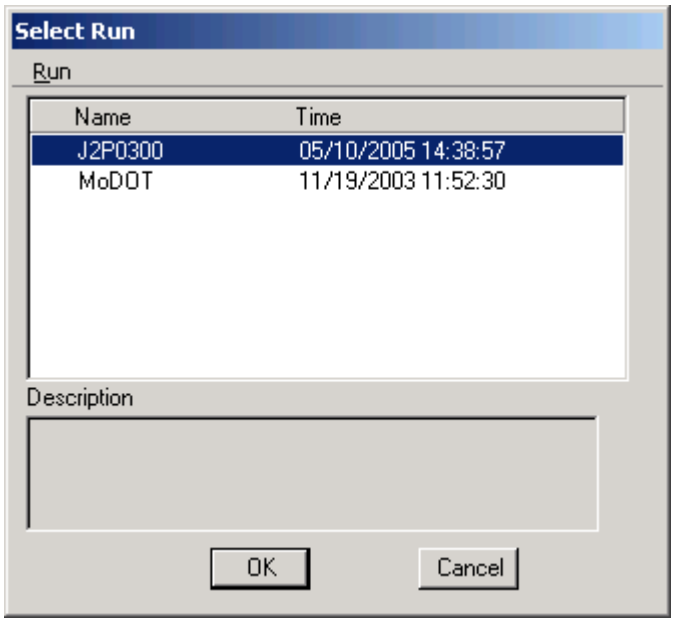
1. Open the Microstation file **t:\br-proj\a_geopak\d2\j2p0300\data\topo_j2p0300.dgn**.

2. Open the project **j2p0300.prj**. Enter the project as user **userc**.

3. Make sure that the Working Alignment is **J2P0300**.

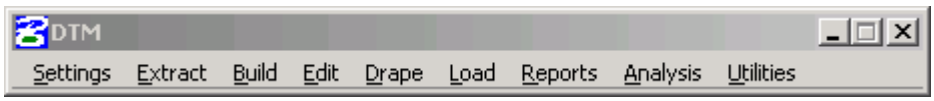
4. Select **Existing Ground** from the upper left corner of the Road Project dialog flow chart.

Copy the **MoDOT** run to **J2P0300**, and open the **J2P0300** run. This is the same **Run > Copy… > Run** process used in creating a new working alignment. GEOPAK uses runs to keep track of specific dialog and tool settings. A run allows the user to repeat a task without having to reenter all of the needed information.



This icon opens the menu bar.

The DTM tools for the following steps may be accessed from either the toolbox shown to the right or the DTM Menu bar depicted below.

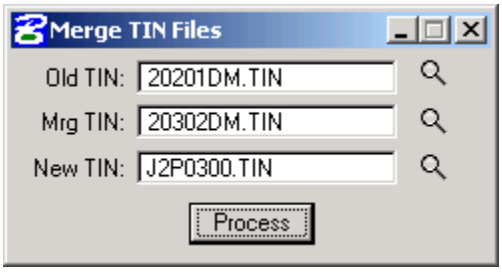


5. Use the **Build Merge TINs** tool (DTM menu path **Build > Merge TINs** or the raised icon shown to the right) to merge the **20201dm.tin** with the **20302dm.tin**.

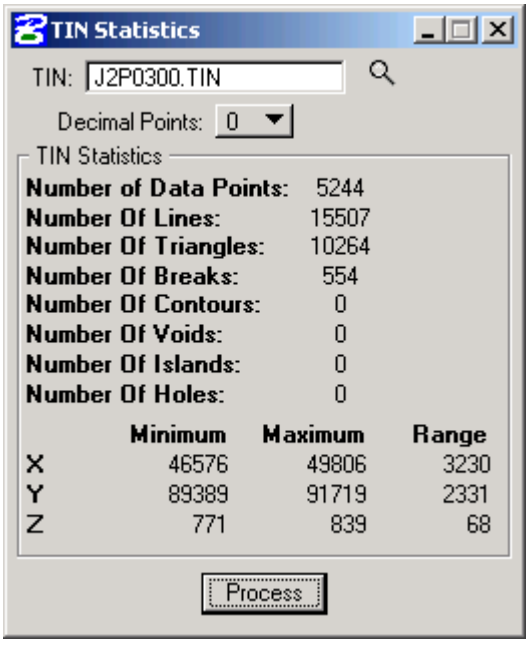
   To do this, set **20201dm.tin** as the **Old Tin** and **20302dm.tin** as the **Mrg Tin**. You can either type in the TIN names or use the **Files** button to select the TINs.

   Set the **New Tin** to **J2P0300.TIN**. This needs to be typed since this file needs to be created. This Files button is used only if the already exists.

   Click on **Process** to initiate the merge tin process.



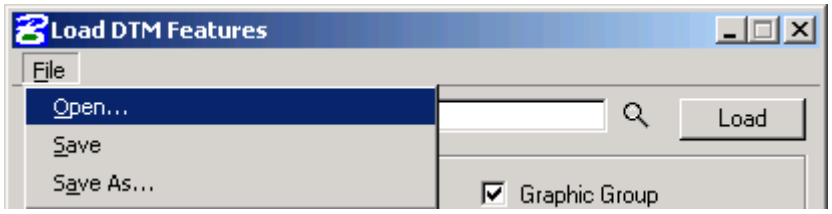
6. Check the **Triangle Statistics** (DTM menu path **Reports > Triangle Statistics TINs** or the raised icon shown to the right) of the tin file **j2p0300.tin**. Use the **Files** button shown below to select the TIN or type its name into the field. Select the **Process** button to calculate and report the TIN statistics.

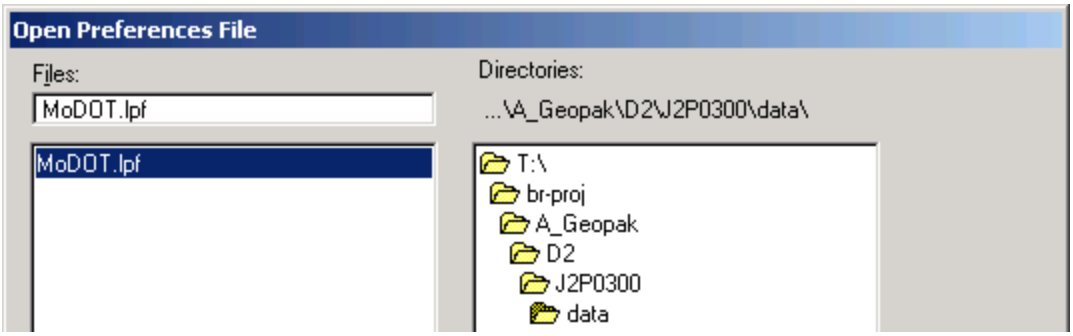


   It is a good idea to check the statistics for any new DTM to make sure that its information matches the known project data. The minimum X and Y values can be used to set the custom coordinates for a MicroStation file created to display the DTM.

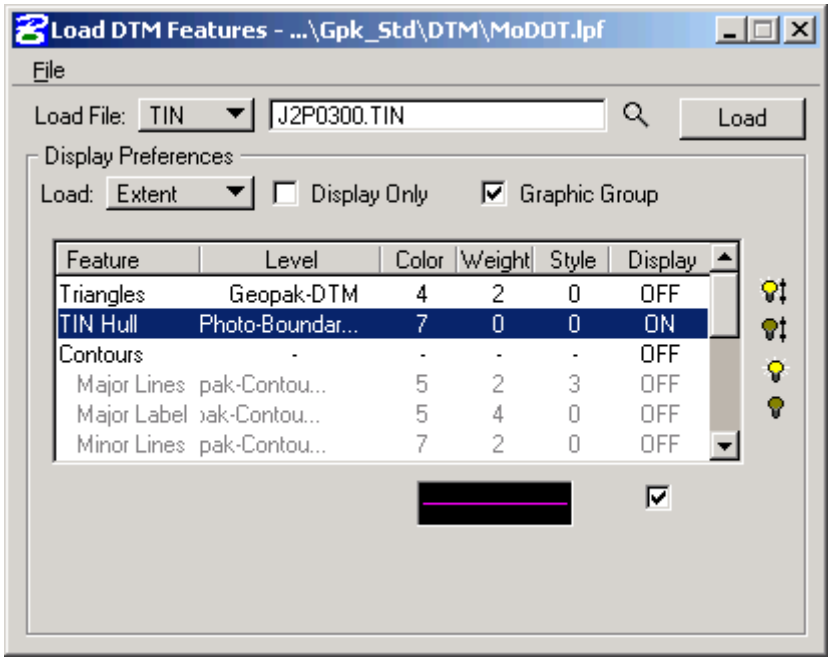
7. Open the **Load DTM Features** dialog (DTM menu path **Load > DTM Feature** or the raised icon shown to the figure to the right).

   To load the MoDOT preferences, select **File > Open** in the **Load DTM Features** dialog and select the file: MoDOT.lpf in the working directory, as shown below.





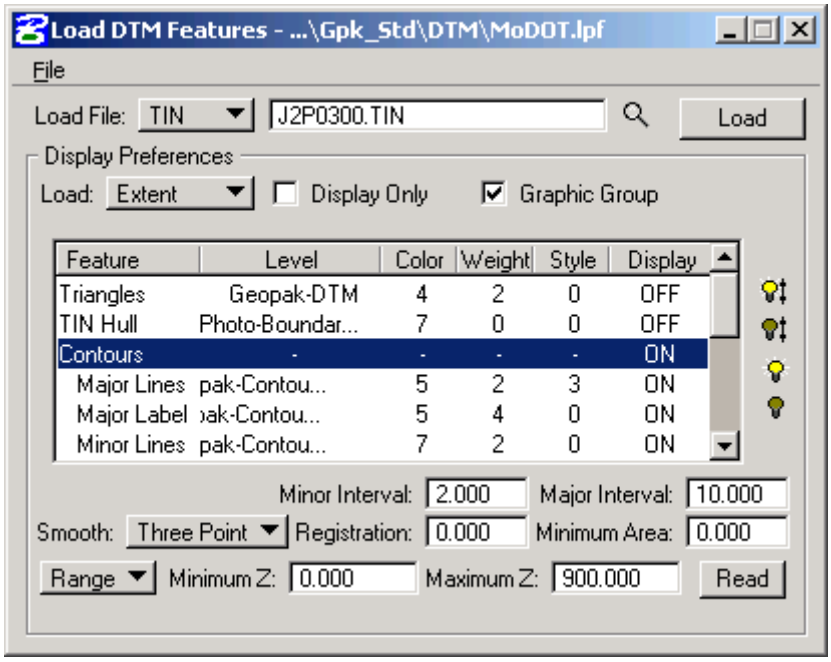
   Set the **Load File** to **TIN** and the file to **J2P0300.TIN**. Load the Tin Hull as a **Graphic Group**, by setting up the dialog as shown below. (See the manual for instructions on how to use the "light bulb" icons to toggle an items Display on and off.)



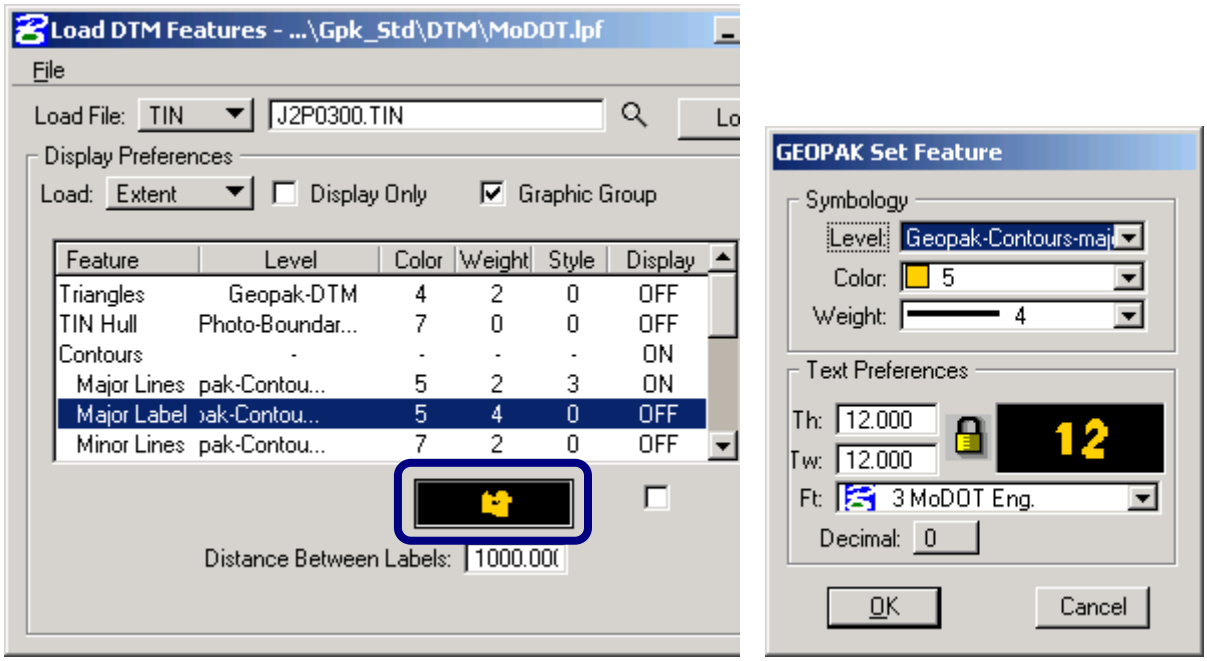
   Fit the MicroStation view so you can see the boundary of the TIN model.

8. Turn **off** the **Tin Hull** and **turn on** the **Contours**, **Major** and **Minor Lines**, and **Major Label** items.

   With the Contours line highlighted, set the following parameters:
   Minor Interval: **2.000**
   Major Interval: **10.000**



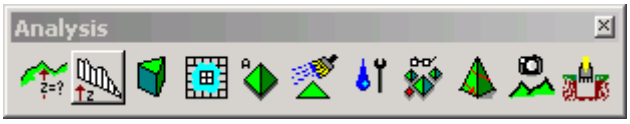
Switch to the **Major Label** line. Set the **text** size to **12** by double-clicking on the preview window outlined below. Set the **Distance Between labels** to **1000**. **Load** the contours as a **Graphic Group**.



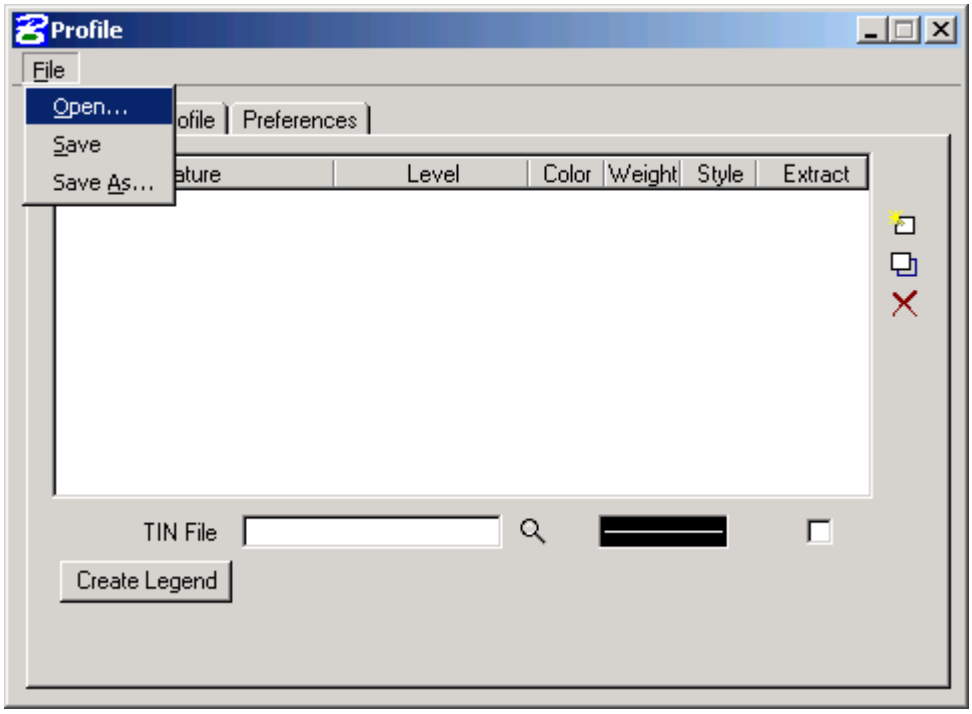
9. Close **Load DTM Features** and **save changes** to the MicroStation drawing.

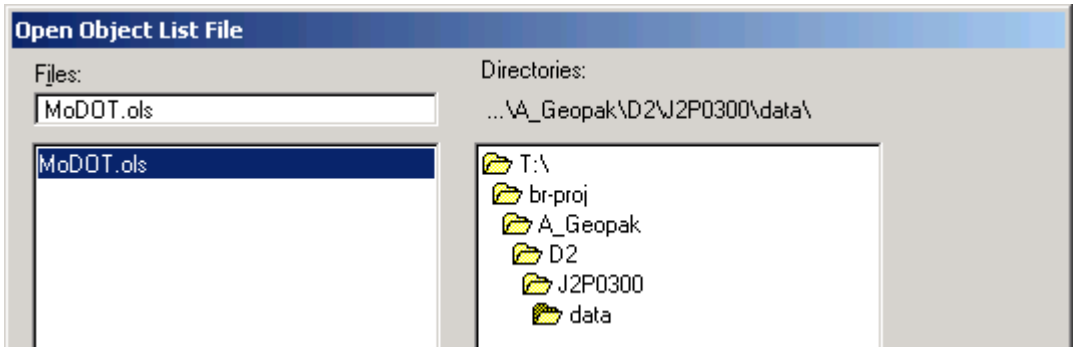
10. **Turn on Level 22**. It contains a line indicating the location of an upstream valley section.

Open the **Site Profile** tool. It can be opened by going to DTM pull down menu item **Analysis > Profile** or clicking on the second icon in the Analysis tool box, which is depicted below and is the tool box in the lower left hand corner of the DTM tools pallet.

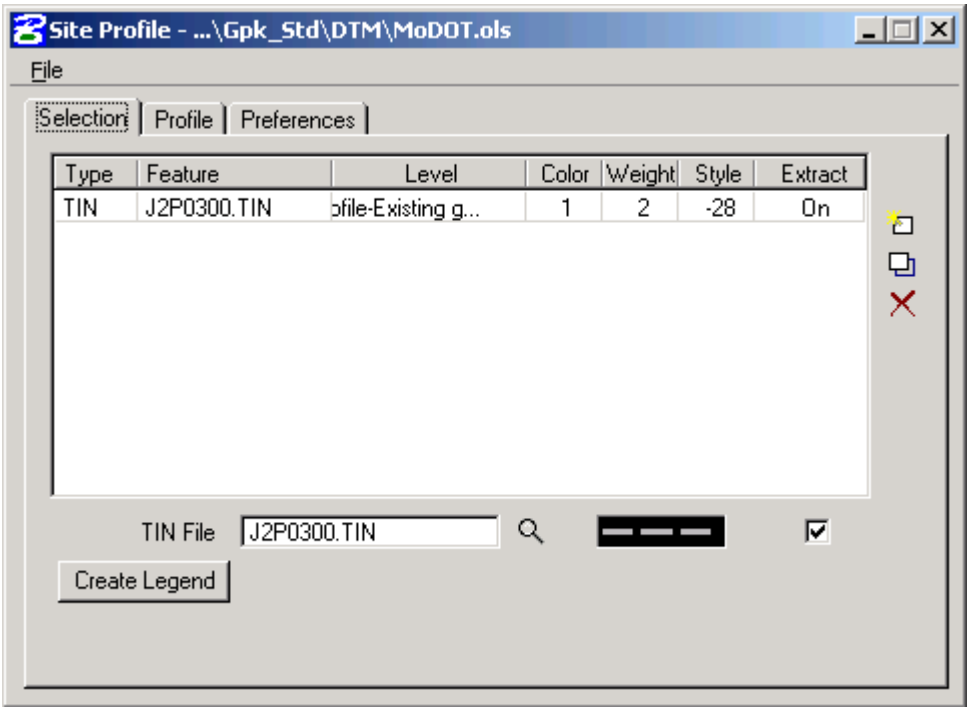


The Site Profile dialog is shown below. Go to **File > Open** and select the file **DOT.ols** in the working directory to load the settings in the Object List File.

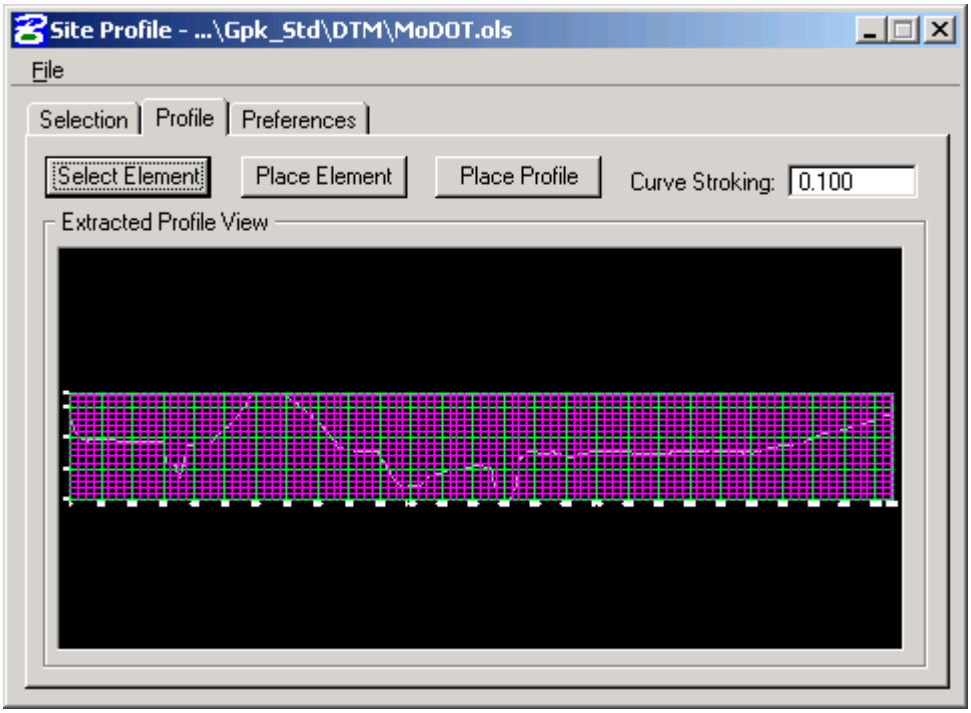




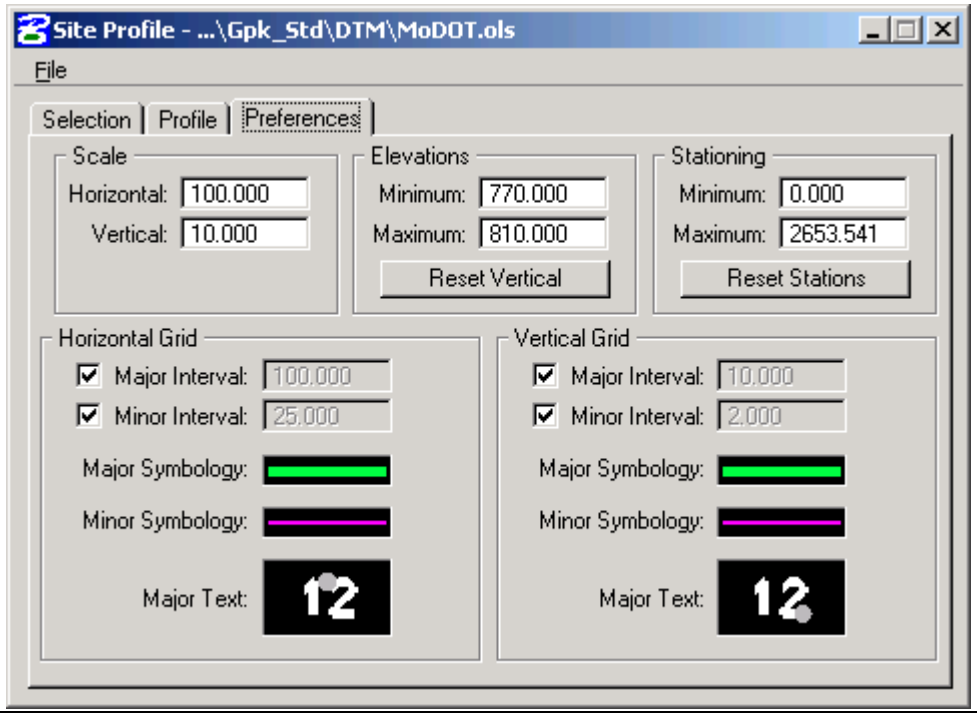
11. Under the **Selection** tab, **add** the **J2P0300.TIN** to the list by clicking on the icon to the right of the **Tin File** field and clicking on the **Add List Item** icon: . Once the TIN has been added to the list, the list area should look like the following:



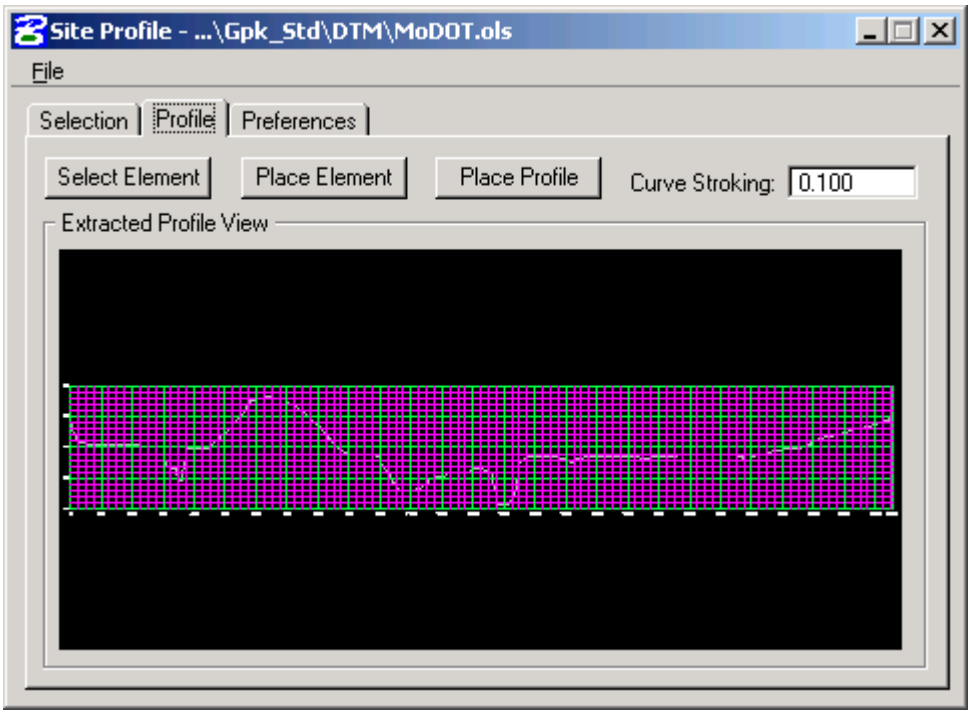
12. Under the **Profile** tab, click on **Select Element**. Data point on the line locating the valley section and accept. This will place the valley section in the dialog, as shown below.



13. Under the **Preferences** tab, modify the preferences for the grid to the settings shown below. Because the OLS file was opened only the **Minimum** and **Maximum Elevations** need to be set so that the vertical grid starts and stops at values rounded to the vertical scale of 1"=10'.



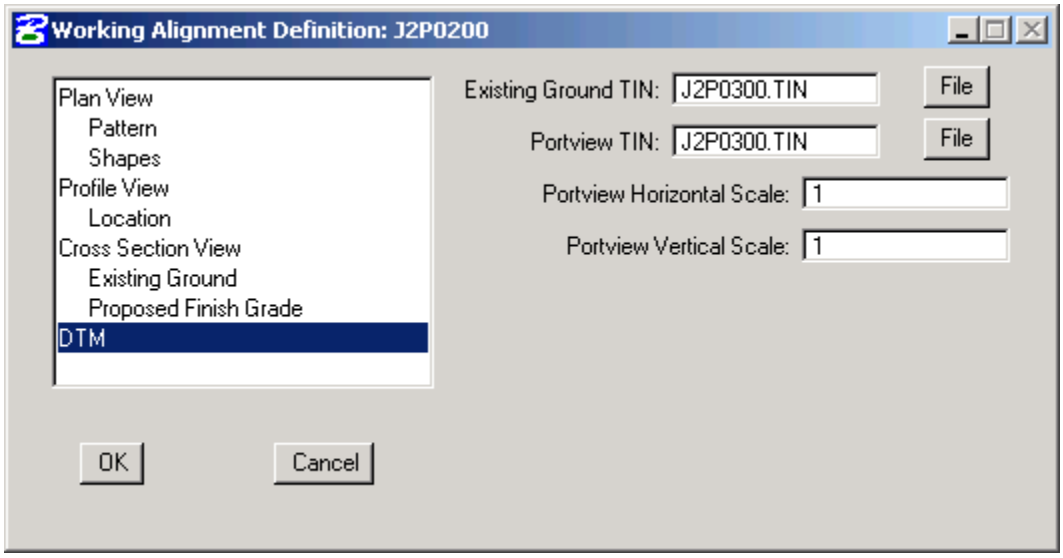
14. Return to the **Profile** tab. The dialog should look similar to the one shown below.



Navigate to a blank area of the MicroStation drawing. Click on **Place Profile** in the Site Profile dialog and place the profile in the MicroStation file.

15. Close all **DTM dialogs** and **save changes** to the MicroStation drawing.

16. Return to the Road Project dialog by selecting the **Project Manager Icon** in the Road toolbox. Click on the working alignment **Define** button. Go to the **DTM** section and set both the **Existing Ground Tin** and **Portview Tin** to **J2P0300.TIN** as shown below.



Click the **OK** button and **Exit Project Manager**.