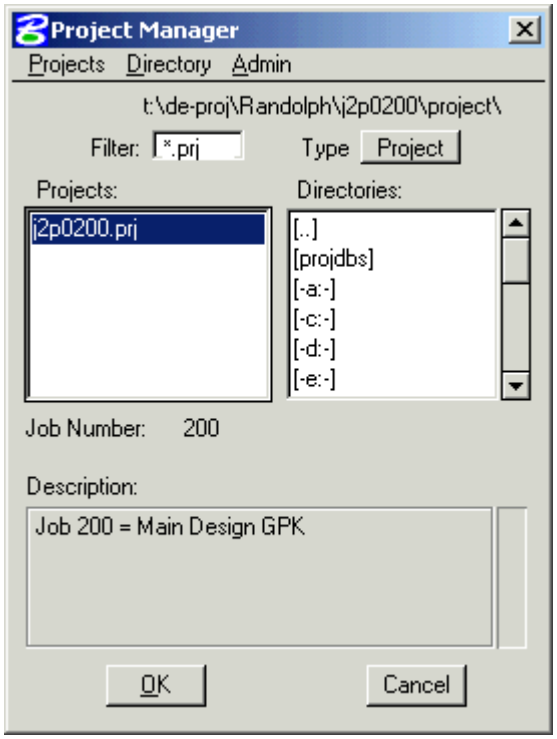
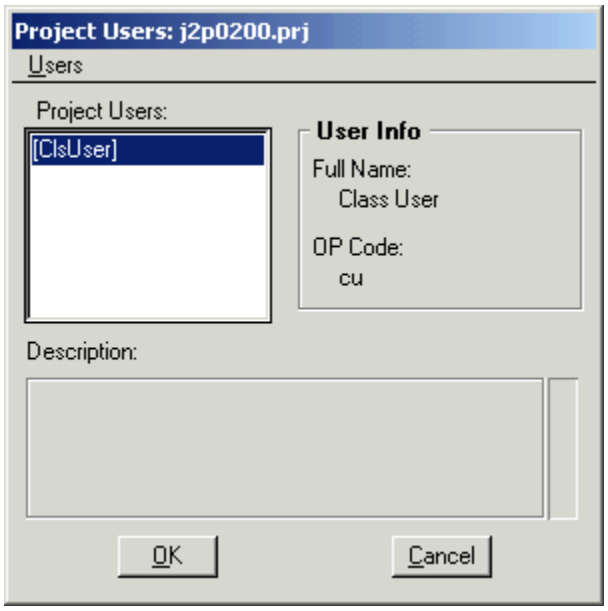
Exercise 4-2

1. Open the Microstation file **t:\de-proj\randolph\j2p0200\data\dtm_j2p0200.dgn**.

2. Open the project **j2p0200.prj**.



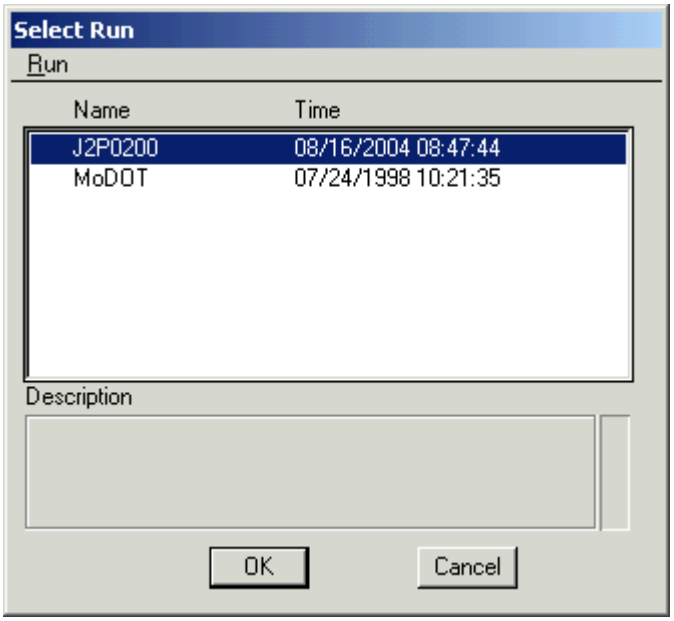
3. Select the user **ClsUser**.



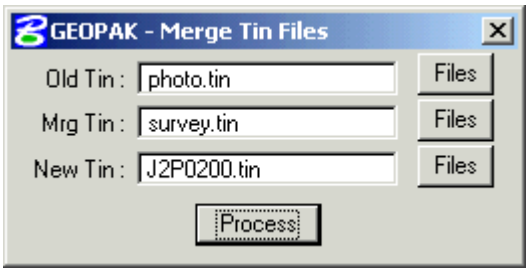
4. Select the **Road Project Manager**.

5. Select the **Existing Ground**.

Copy the MoDOT run to **J2P0200**, and open the **J2P0200**run.

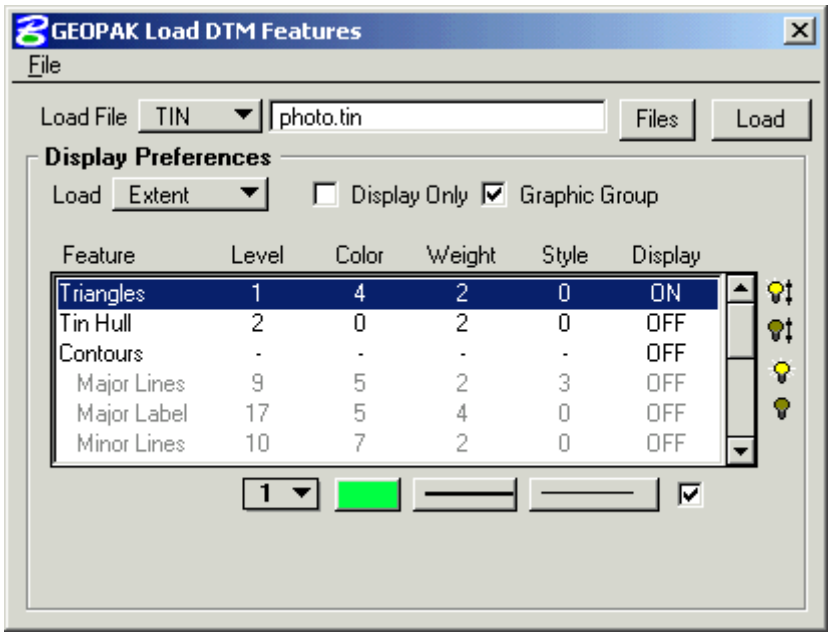


6. Use the **Merge TINs** tool (**DTM Menu: Build > Merge**) to merge the (Mrg Tin:) **survey.tin** into the (Old Tin:) **photo.tin** to create the (New Tin:**) J2P0200.tin**. The Files button can be used to select the first two tins; but the name of the new tin needs to be typed because it does not exist yet.

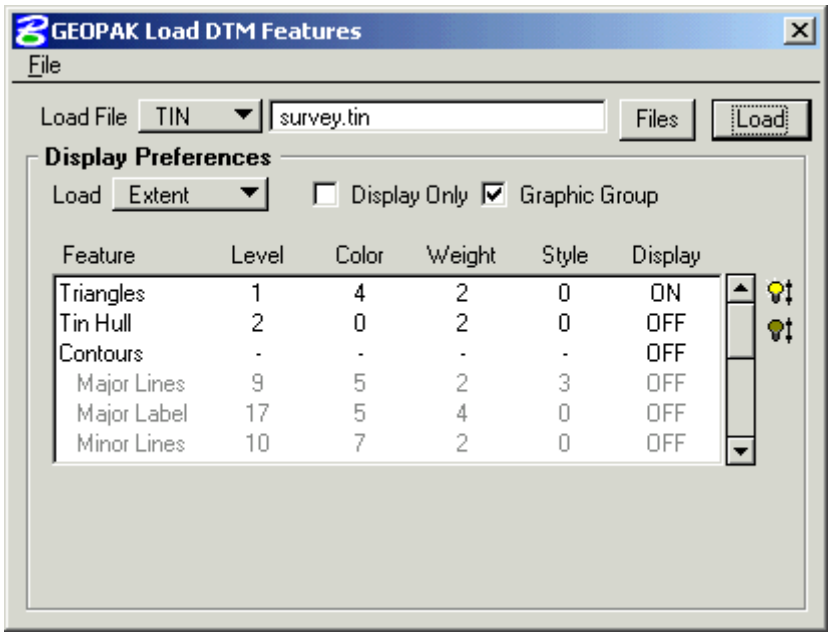


You should get the following error in the MicroStation Status bar: Build Merge Error .

7. To see the reason for the error, plot the two existing tins using the DTM Menu: **Load > DTM Features tool**, using the settings shown in the following dialog. (**Note:** Make sure that Display only is unchecked, that Graphic Group is checked, that Display is ON for the Triangles Feature, and that Display is OFF for all other features.)



Click on the **Load** button to plot the triangles for the **photo.tin**. Do a MicroStation **Fit View**. Switch the tin to the **survey tin** and load its triangles using the same settings.

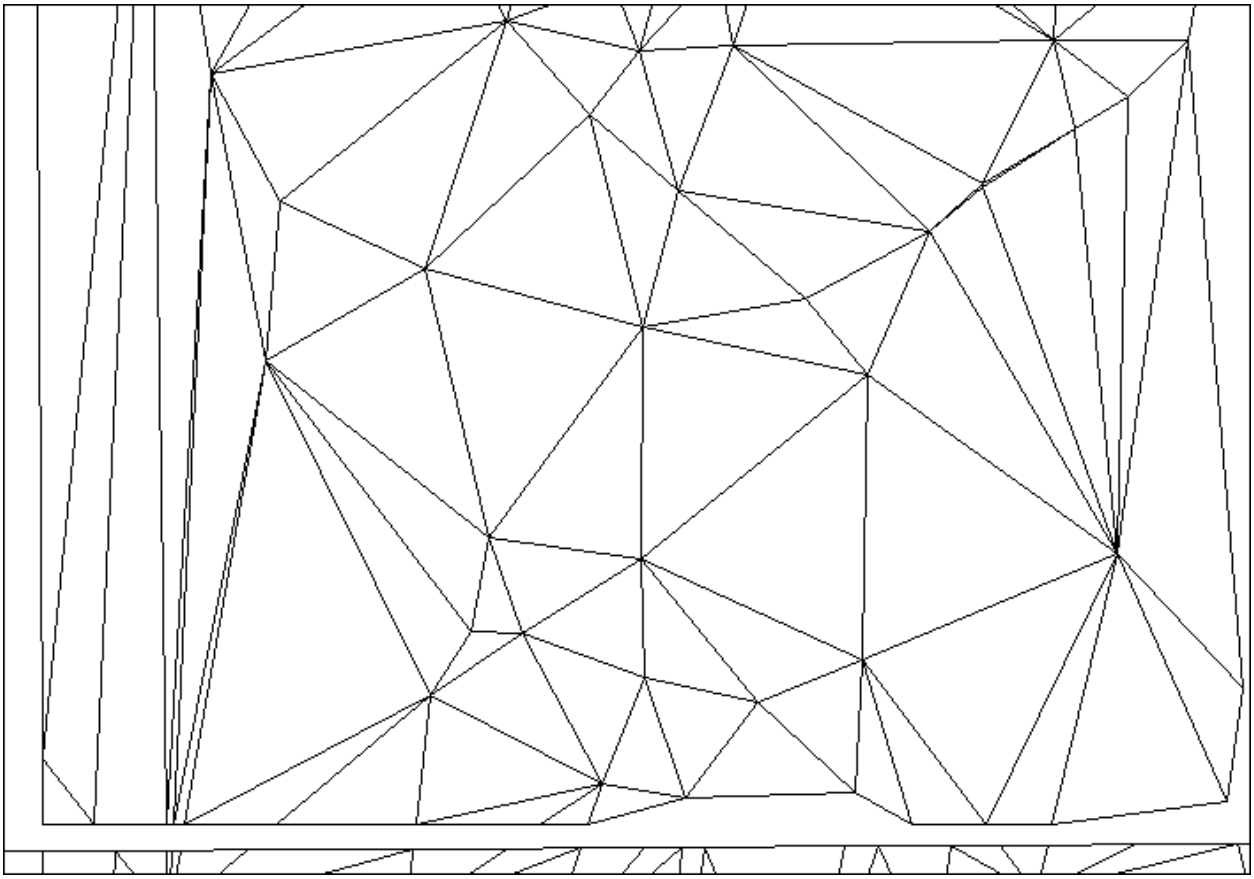


Window into the area between the two tins and notice that they do not touch. For two tins to be merged in GEOPAK, they must have at least one point in common.

8. There are several ways to connect the two tins. One option is to edit one of the tins to create connecting triangles between the two tins, but this rather tedious. Another option is to have the additional points added to the data file used to create the survey tin and coincide with the photo tin. The option used for this exercise, is to plot information about the tins in the file and extracting the graphics.

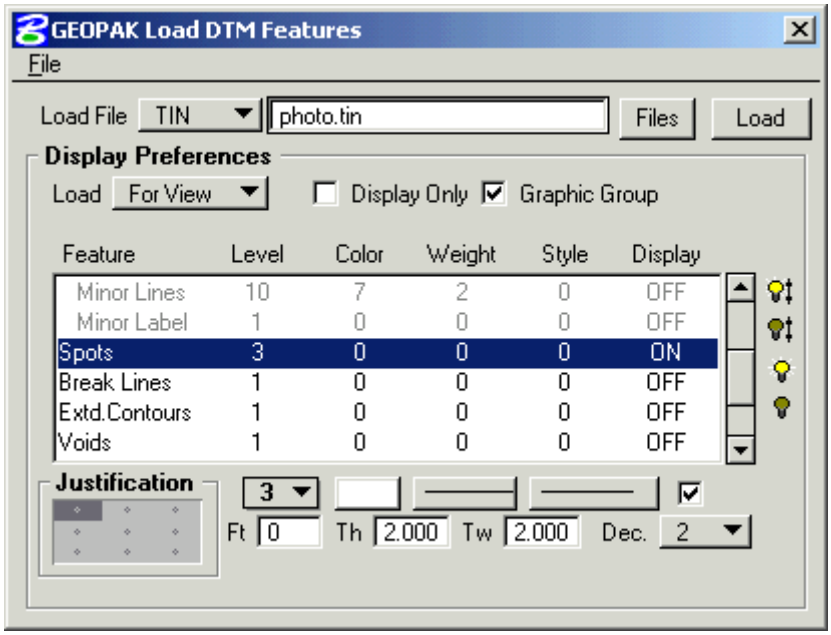
   A few of the vertex elevations for the photo tin and all of the vertex elevations for the survey tin will be plotted into the 3D file dtm_j2p0200.dgn. Once the elevations are plotted as text, the Extract Graphics tool will store points based on the text locations.

   To limit the number of elevations plotted from the photo tin, window in on the area between the tins so that only those vertices of the photo tin adjacent to the survey tin are visible, as shown below.

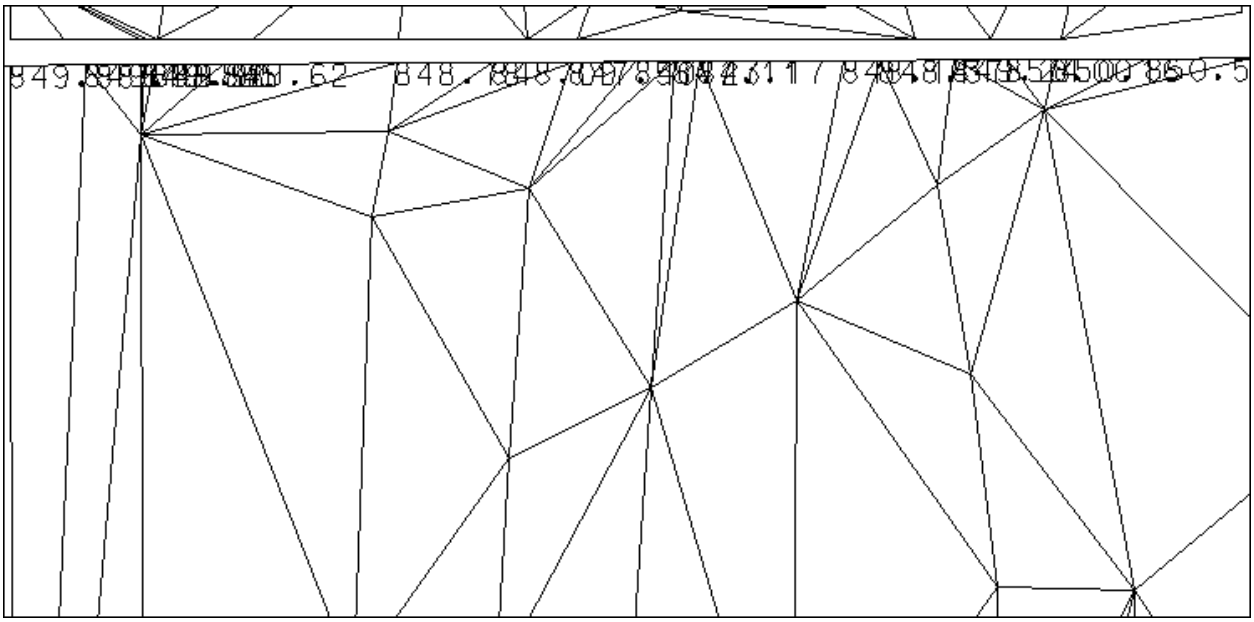


   By using the Load DTM Feature option of Load **For View**, only those vertices of the photo tin appearing in the MicroStation window will be plotted.

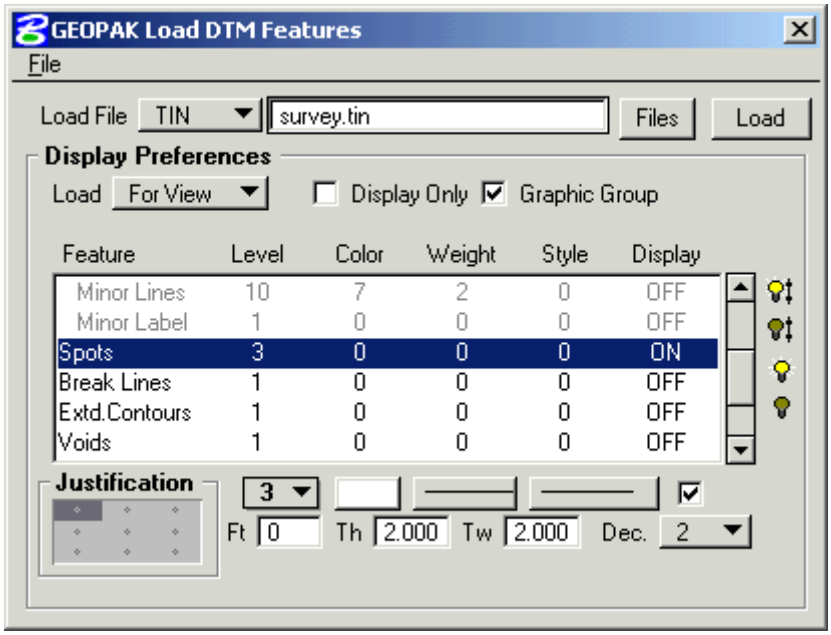
9. To plot the required elevations for the photo tin, access the DTM Menu: **Load > DTM Features tool**, using the settings shown in the following dialog. To do this, set the **TIN** to **photo.tin**, the Load option to For View, and make sure that Display only is unchecked & that Graphic Group is checked. Next turn off the display for all items, scroll to the Spots line in the list box and set the options for this feature as shown below. (Color, Style, & Weight are all 0). When these are set, click on the **Load** button to plot the elevations for the **photo.tin**.



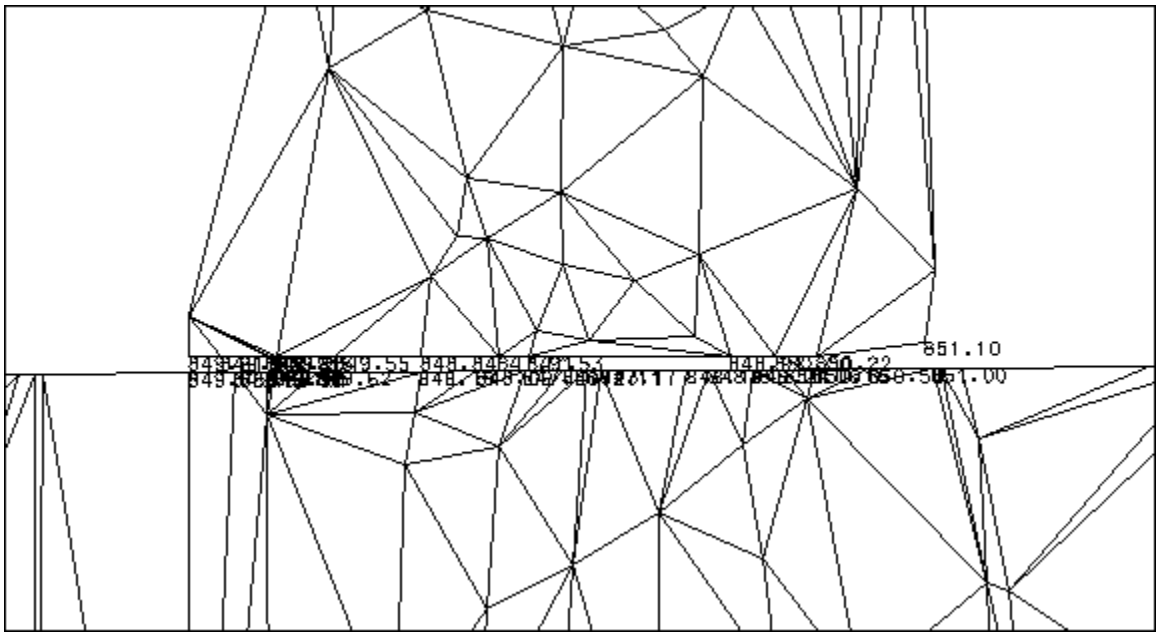
10. Adjust the MicroStation view so that only the lower edge of the survey tin is visible, as shown below.



11. In the Load DTM Features dialog, switch the tin to the **survey tin**, leaving all of the other settings the same. Click on Load to plot the desired elevations for the **survey.tin**. Close the Load DTM Features tool and **save** the changes to the MicroStation drawing.



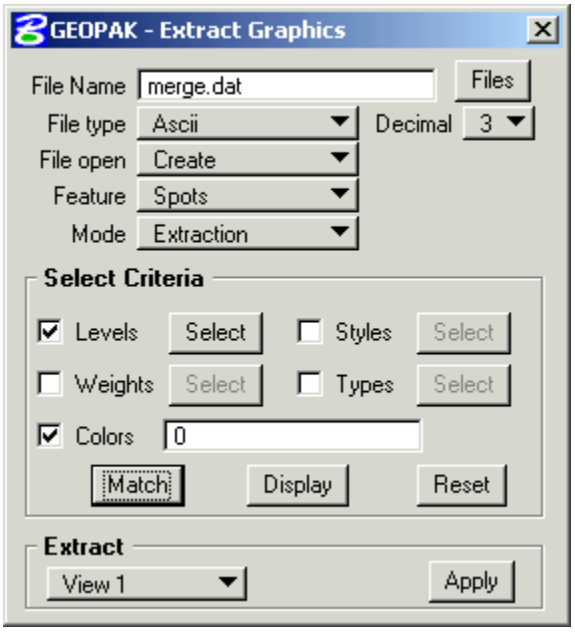
Window out once and delete any elevations that are not on the boundaries between the two tins, as shown below. You will need to either override or turn of t he Graphic Croup lock to keep from deleting all of the elevations.



Save the changes to the MicroStation drawing.

12. From the DTM menu, select **Extract > Graphics**, which will be used to create a data file from the plotted elevations. When the following dialog appears, set the name of the data file by typing in the **merge.dat** into the File Name field. Set the toggles to the following values:

File type **Ascii** Decimal **3**
File open **Create**
Feature **Spots**
Mode **Extraction**



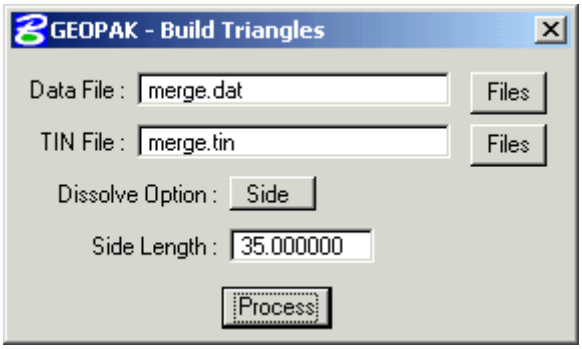
In the Select Criteria section of the dialog, check **Levels** and **Colors**. Click on the **Match** button and DP (data point) on one of the elements of text plotted in the drawing. This will set the level and color to match the text. The coordinates (X, Y, Z) of text nodes will be stored in the DAT file.

Click on **Apply** to create the data file. Close the Extract Graphics tool. Because an ASCII, as opposed to a binary, file was created, the results can be viewed in Ultra Edit or another text editor. The file should consist of a series of lines, each one giving the X, Y, and Z coordinate of a spot point. A portion is shown below:

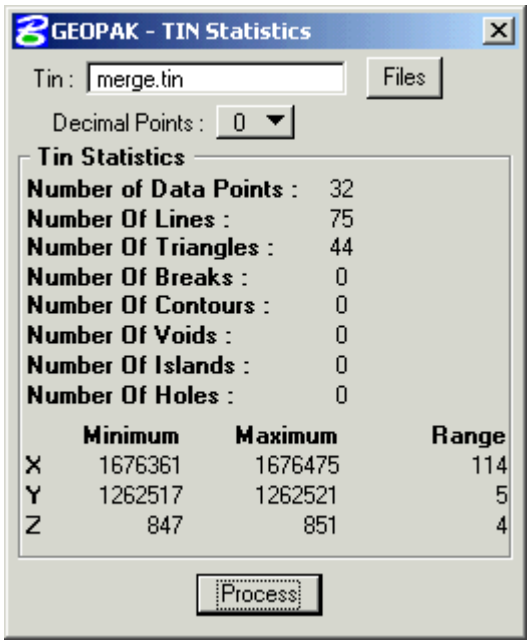
```
1 1676361.022 1262516.635 849.881
1 1676367.934 1262516.676 849.884
1 1676372.907 1262516.705 849.882
1 1676373.330 1262516.708 849.895
1 1676374.122 1262516.713 849.847
1 1676380.538 1262516.751 849.618
1 1676396.368 1262516.844 848.780
1 1676405.170 1262516.896 848.091
1 1676412.311 1262516.938 847.497
```

13. Use the Build Triangles tool (**DTM Menu: Build > Triangles**) to create the **TIN file: merge.tin** from the **Data File: merge.dat**. (Since the file merge.tin does not exist yet, its name needs to be typed into the TIN File field.)

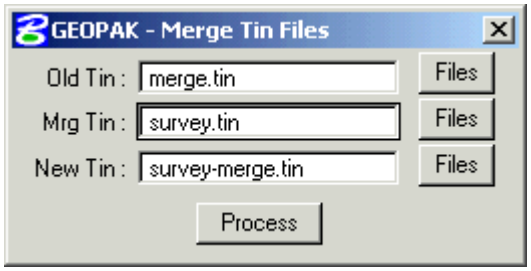
    Set the Dissolve Option to **Side** and the Side Length to **35**. Click on Process to create the TIN.



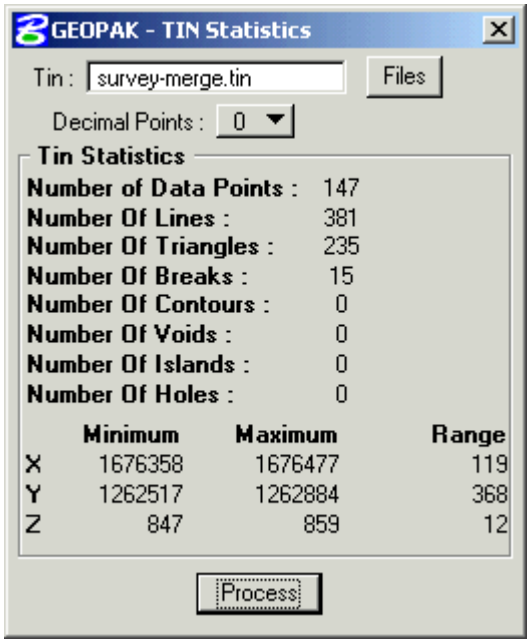
14. Check the **Triangle Statistics** (**DTM Menu: Reports > Triangle Statistics**)of the tin file **merge.tin**



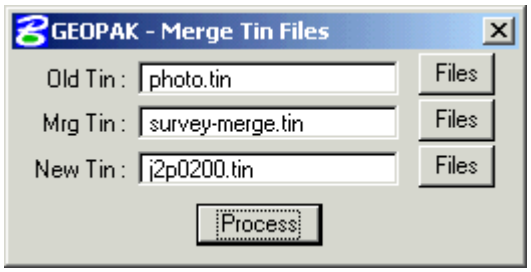
15. Use the **Merge TIN** tool (**DTM Menu: Build > Merge**) to create a new TIN from **merge.tin** (Old Tin) and **survey.tin** (Mgr Tin). Call the new TIN **survey-merge.tin**. (**Note:** the survey tin is used as the merge tin because it contains data actually collected in the field.)



Check the statistics for the new tin.

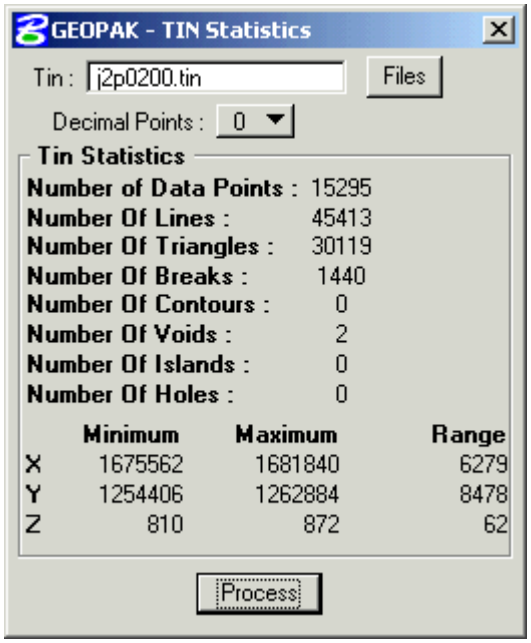


16. Try to create the **j2p0200.tin** again using **photo.tin** as the Old Tin. This time use **survey-merge.tin** as the Mrg Tin.



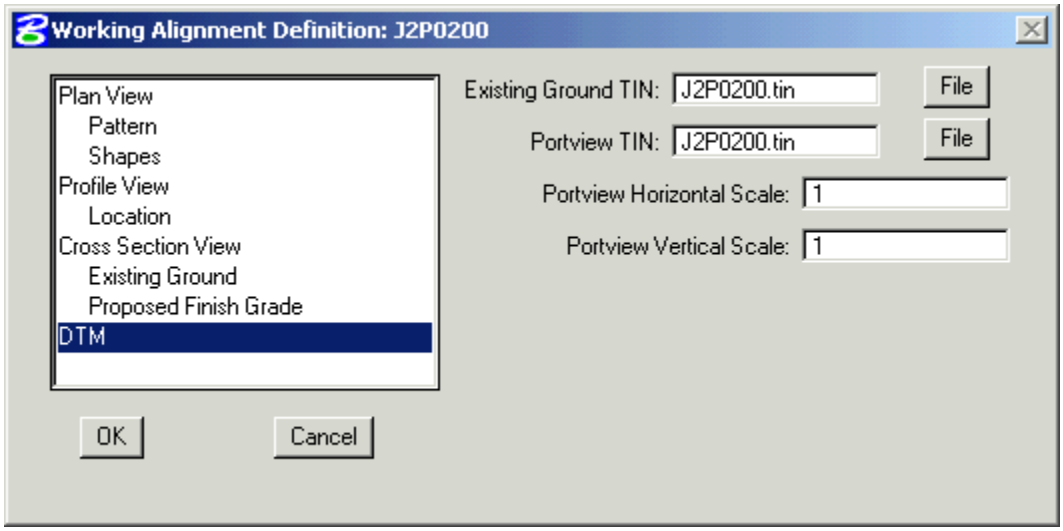
You should now get the following in the MicroStation Status bar: Build Merge Completed.

17. Check the **Triangle Statistics** of the tin file **j2p0200.tin**



Exit all DTM tools, toolboxes, and menu.

18. Bring up the Road Project dialog and enter the **Definition** (Define button) for the J2P0200 working alignment.

In the DTM section set the following:

Existing Ground TIN: **J2P0200.tin**
Portview TIN: **J2P0200.tin**
Portview Horizontal Scale: **1**
Portview Vertical Scale: **1**