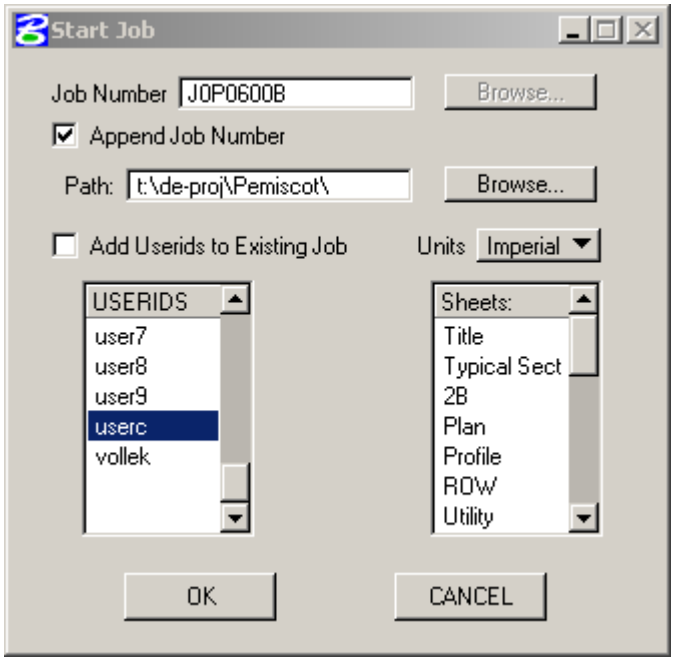
Borrow Pit (End-Area Method)

1) Get into any MicroStation file and create the Project Folder and default MicroStation Files by selecting **MoDOT > Start GeoPak Job/Add User**.



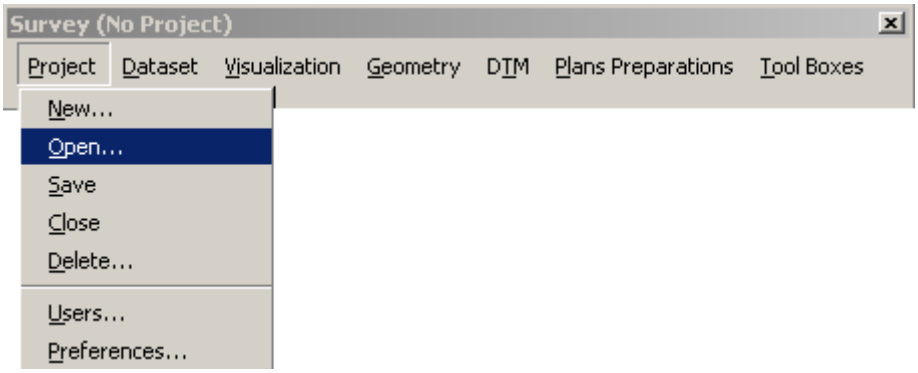
2) Open T:\de-proj\Pemiscot\J0P0600B\data**plan_J0P0600B.dgn**

3) Using Windows Explorer go to **T:\de-proj\Survey Data\Borrow Pit** and copy all of the files in that folder to **T:\de-proj\Pemiscot\J0P0600B\data**

4) Open GeoPak Survey by selecting the following:

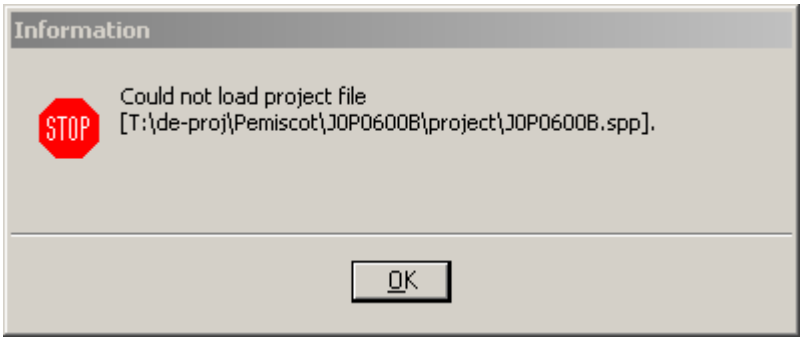
Applications > GeoPak Survey > Survey

5) In the Survey menu bar select **Project > Open**

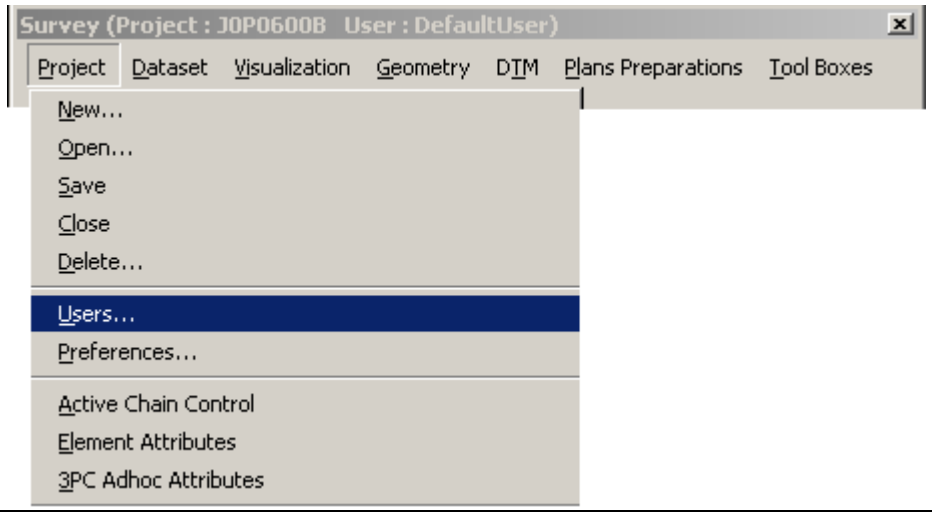


6) Select the following file **T:\de-proj\Pemiscot\J0P0600B\project\J0P0600B.prj**

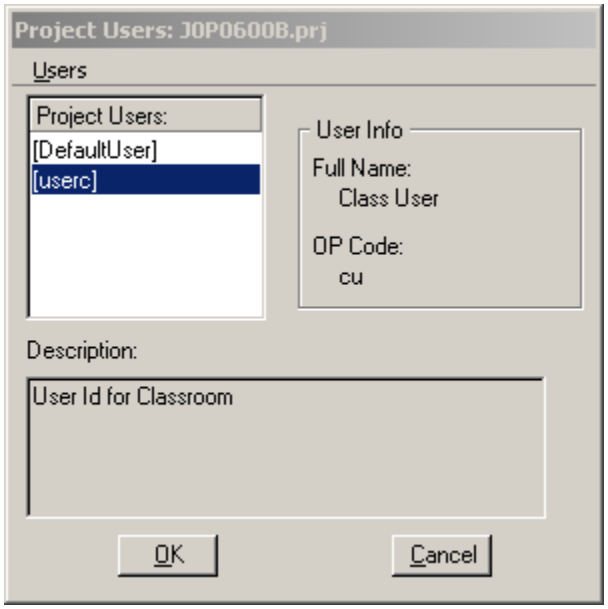
7) Select "OK" to the following Dialog.



8) In the Survey menu bar select **Project > Users**

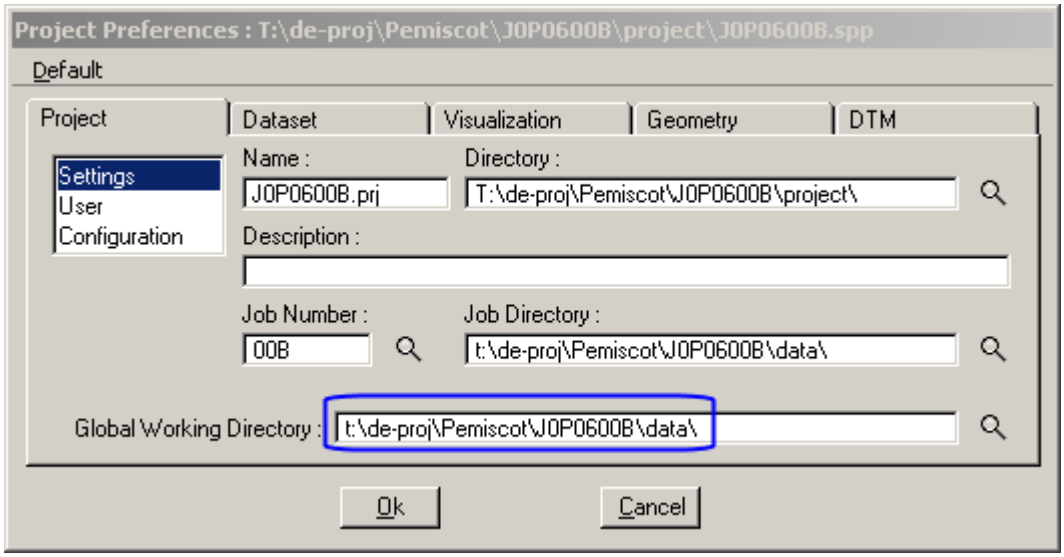


9) Select Userc as the Project User and then select “OK”.

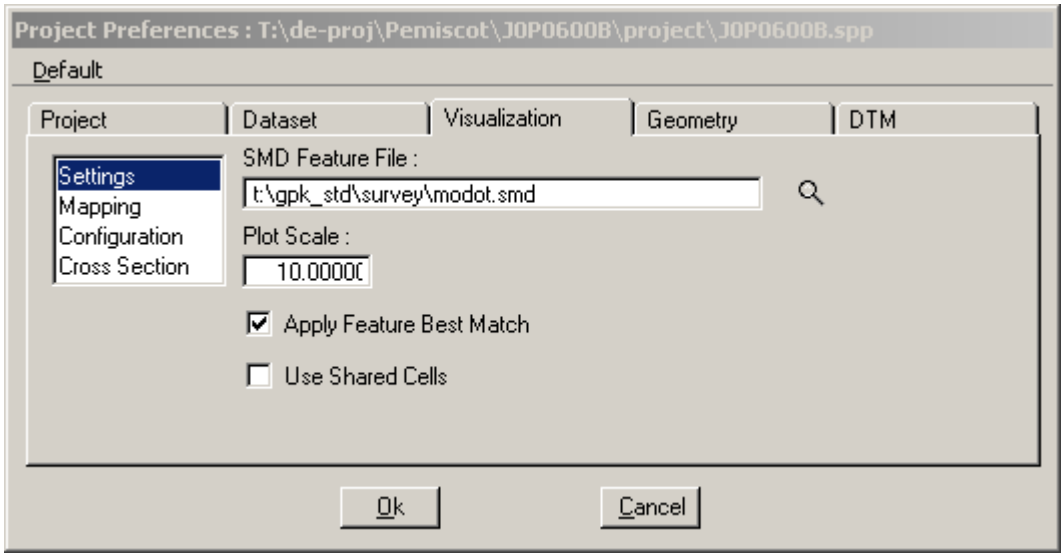


10) Open your **Project Preferences** by selecting **Project** > **Preferences**

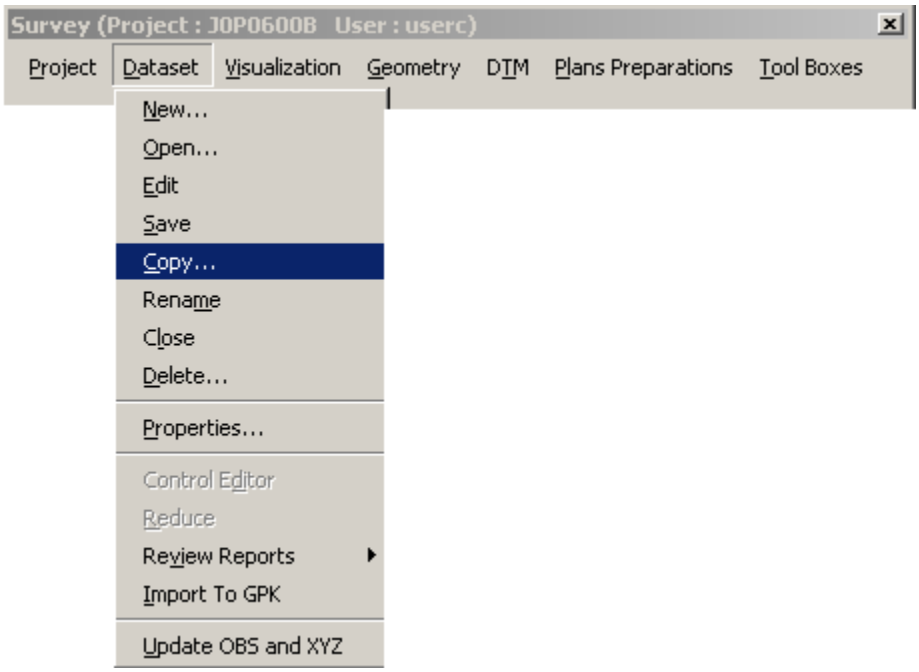
Point the Global Working Directory to **T:\de-proj\Pemiscot\J0P0600B\data**



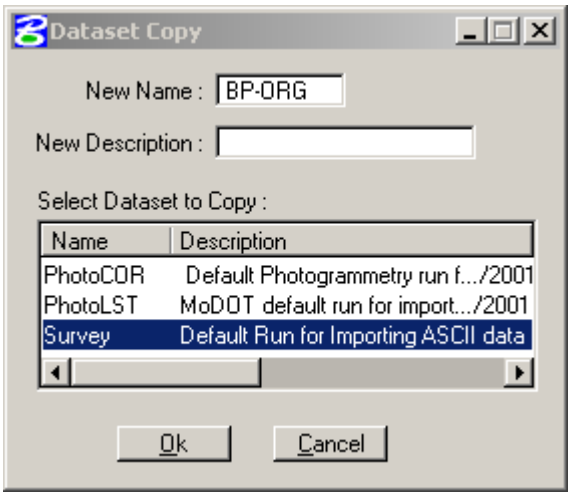
11) Under the **Visualization Tab** select "Setting" and set the **Plot Scale = 10** and the hit the "**OK**" button.



12) In the Survey menu bar select **Dataset > Copy**

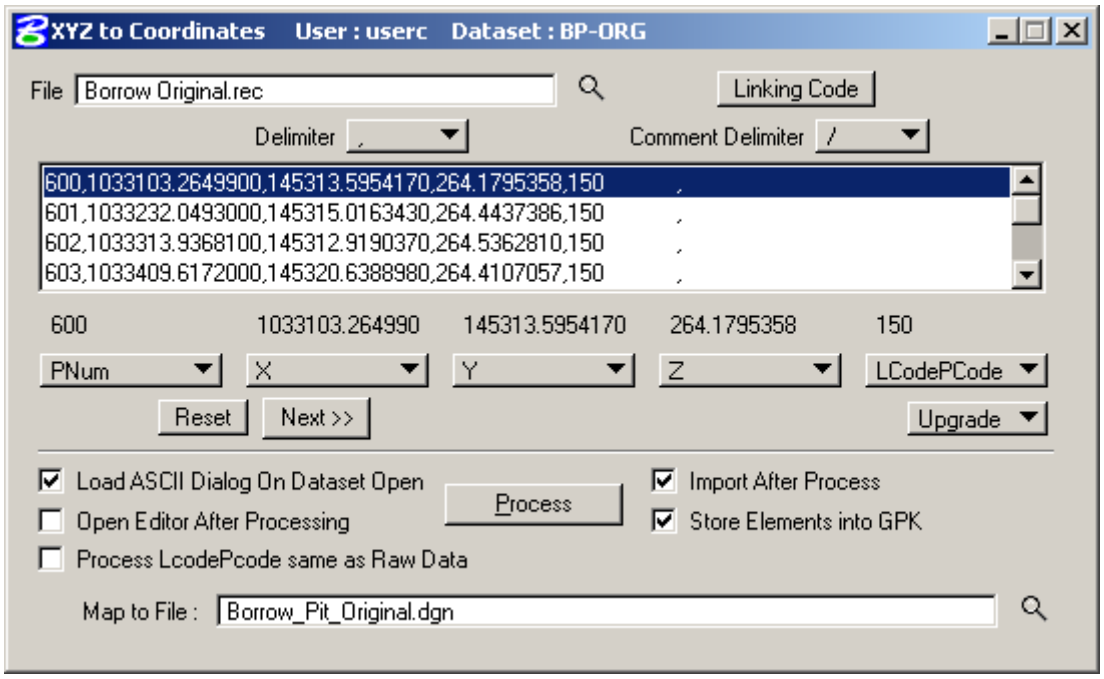


13) Copy the "**Survey**" Dataset. Call the new Dataset **BP-ORG** (See Below).



14) Fill out the **XYZ to Coordinate** dialog as below:

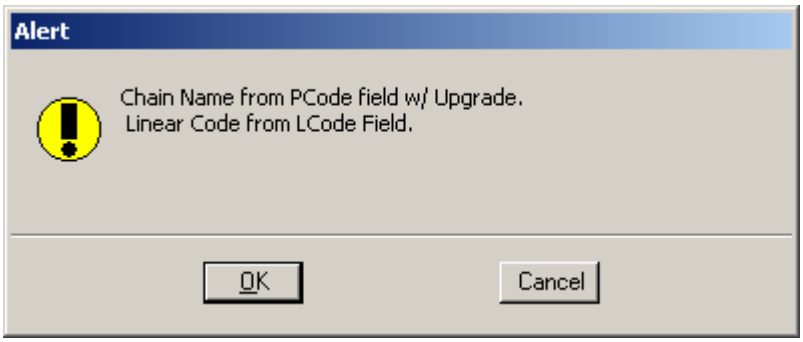
- Browse for a **REC file** in the Data folder named = **Borrow_Original.rec**



- Type in the **Map to File** name = **Borrow_Pit_Original.dgn** The Survey Data will be mapped to this file. You cannot browse for this file because it does not exist at this point.

- Highlight the first line in the REC file and select the "**Process**" Button.

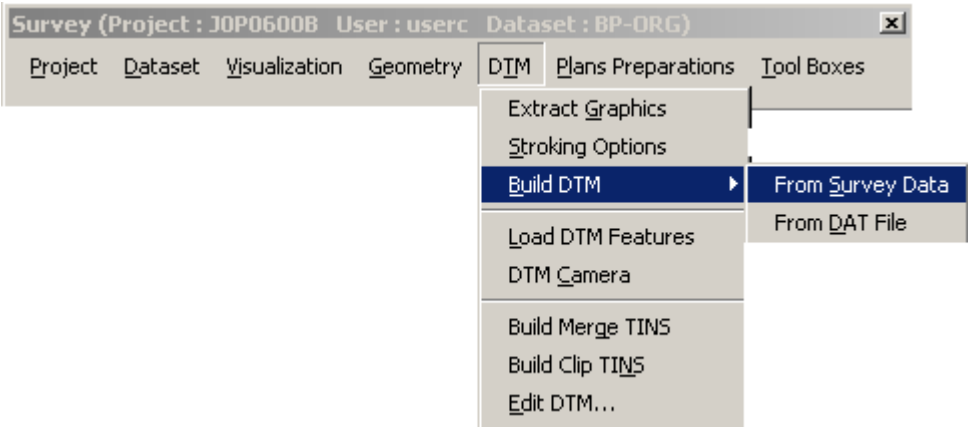
15) Ignore "**Alert**" dialog by selecting "**OK**"



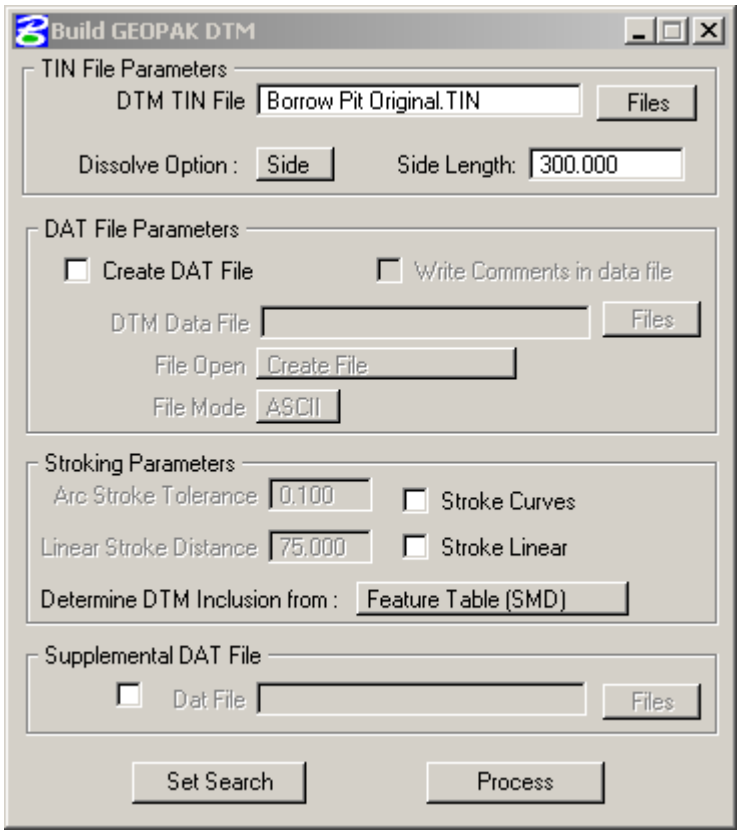
16) Do a MicroStation Fit View "**Fit View**" and the Borrow Pit Survey shots will appear.

17) Close down the **XYZ to Coordinate** dialog.

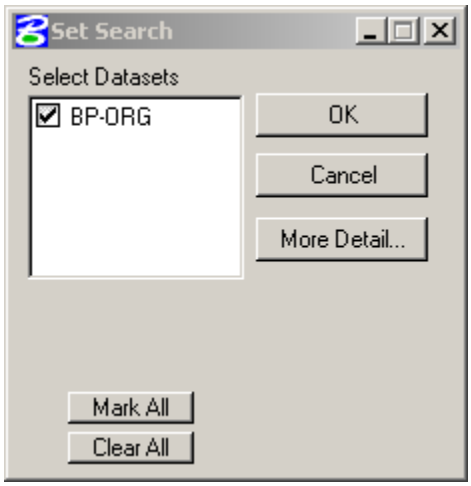
18) In the Survey menu bar select **DTM** > **Build DTM** > **From Survey Data**



19) Fill out the "**Build GeoPak DTM**" dialog as below.



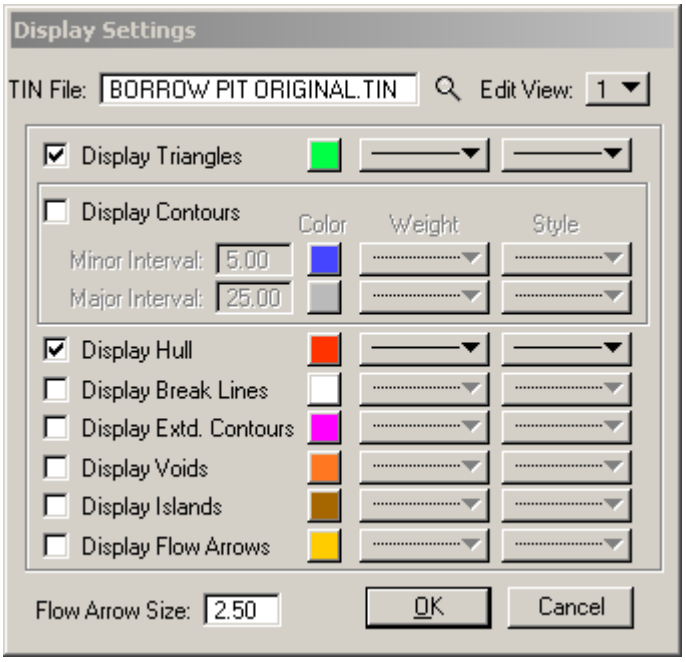
In addition, select "**Set Search**" and make sure "**BP-ORG**" is checked. If so select "**OK**".



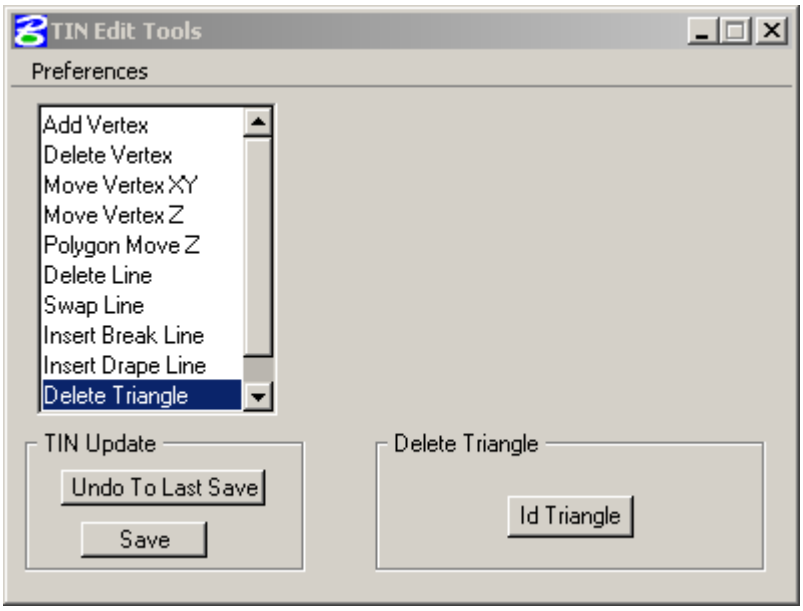
Select the "**Process**" button.

20) To View & Edit the new TIN file go to the Survey menu bar & select **DTM > Edit DTM**

Set the **Display Preferences** as below.

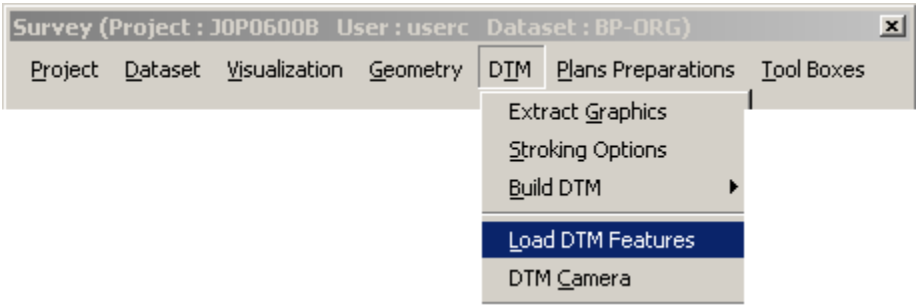


Use the **Delete Triangle** option and remove any Bogus Tin lines on the outside of the Tin.

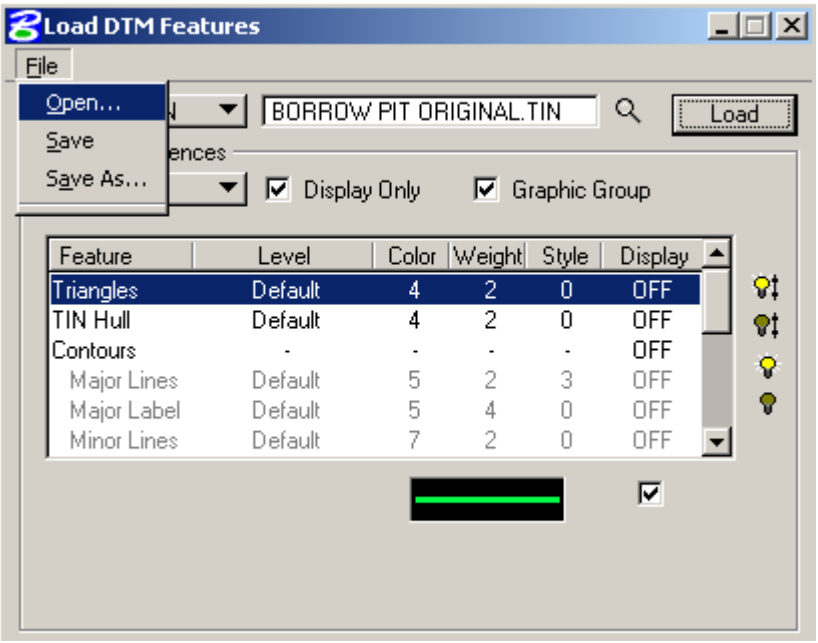


After deleting, the bogus tin legs select "**Save**" and **Close** the Tin Edit tools.

21) Next were going to plot the Tin Hull (boundaries) of the Borrow Pit Original Tin. To do this go to the Survey menu bar and select **DTM > Load DTM**

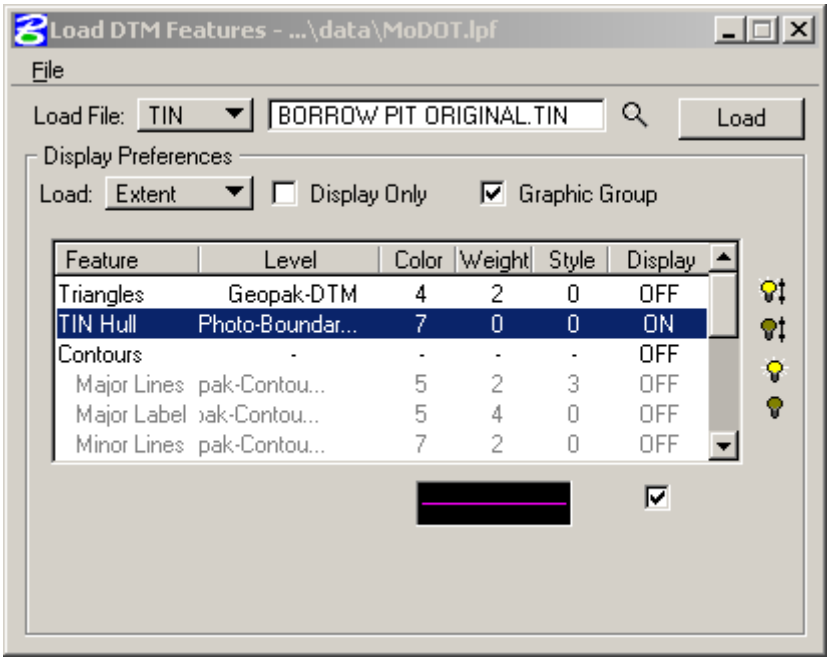


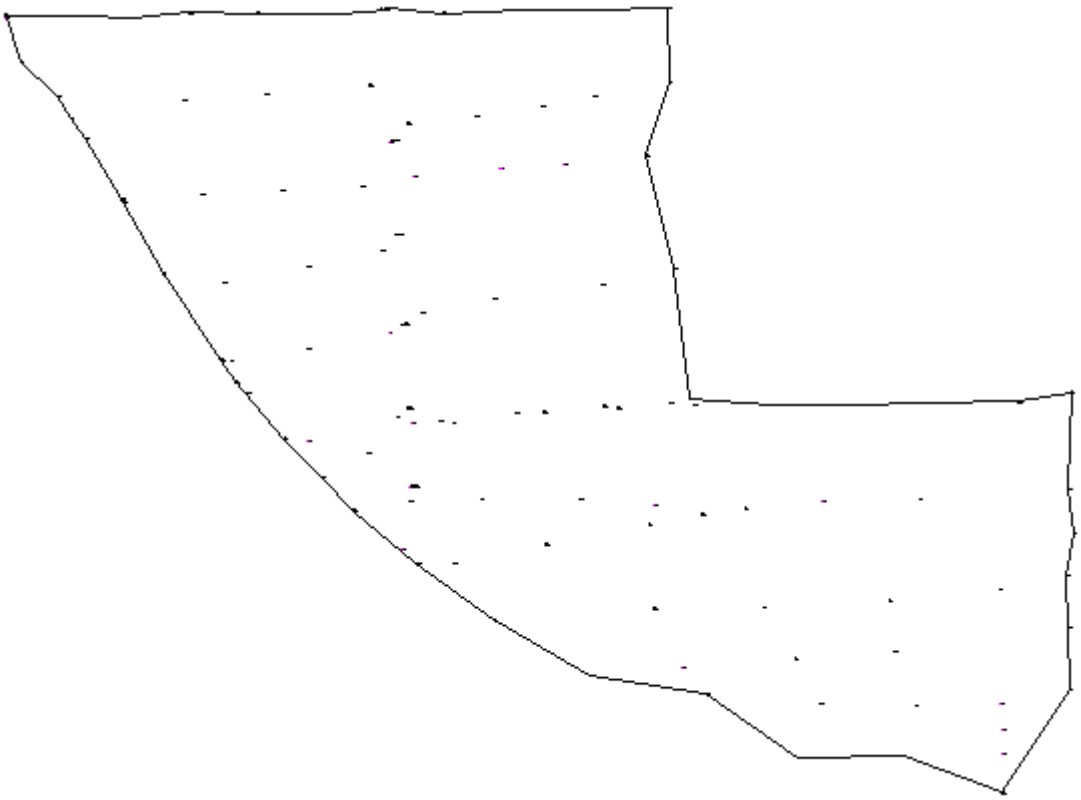
- Within the Load DTM Features set all the Feature Preferences by selecting **File > Open**



- Select the **MoDOT.LPF** that is located within the data folder.

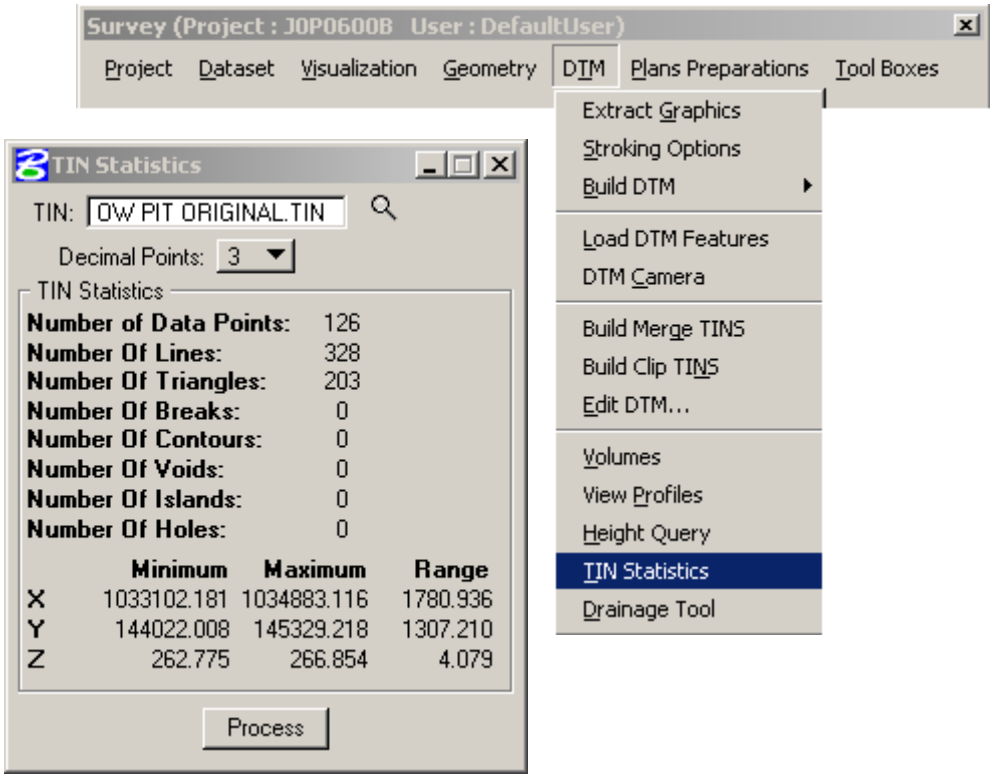
22) Set up the **Load DTM Features** dialog as below. Make sure that only **Graphic Group** is only checked on. We are only going to load the **Tin Hull** (outer boundaries) of the DTM.



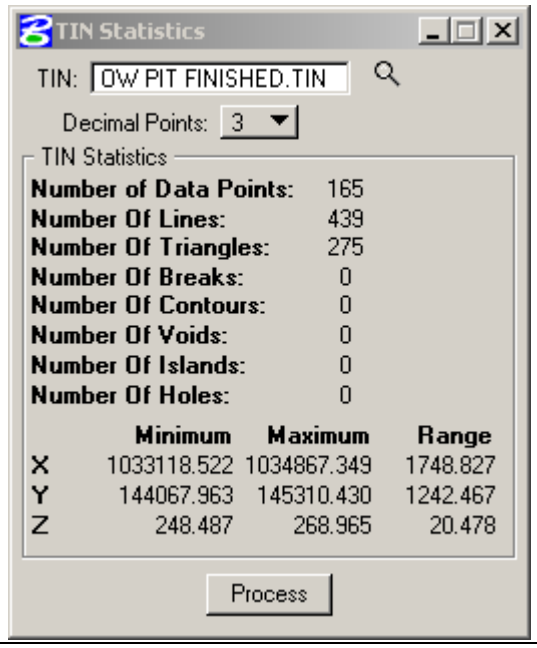


23) In the Survey menu bar select **DTM > Build DTM > From Survey Data**

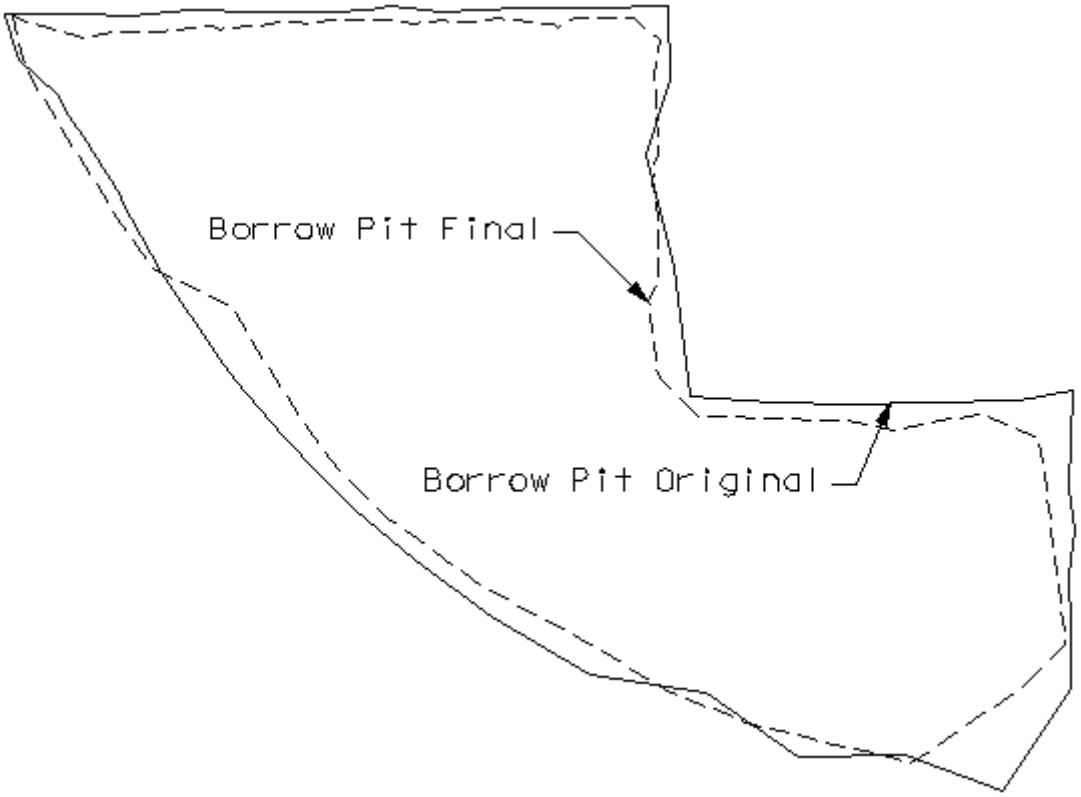
Select Borrow Pit Original



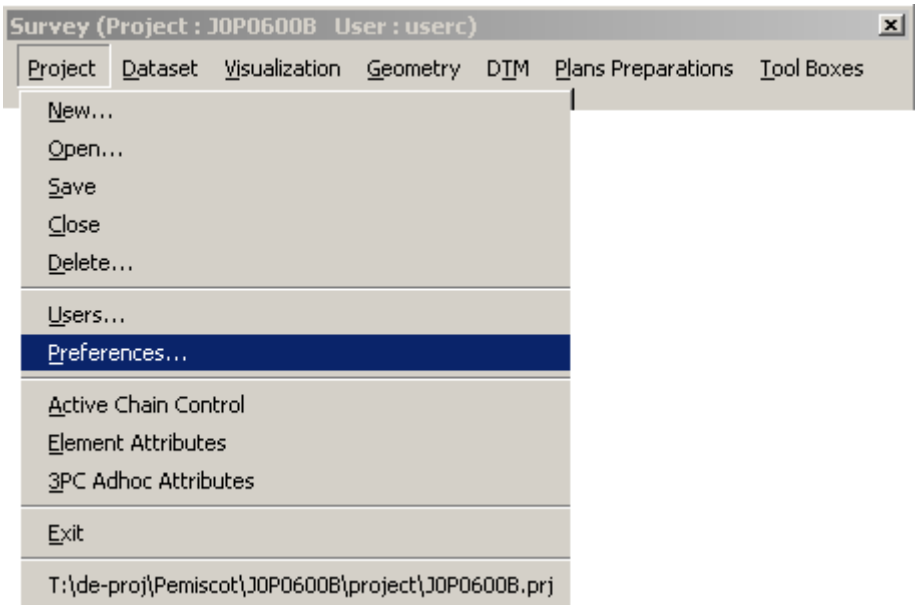
24) Repeat **steps 10 through 22** for the Survey file called **Borrow Finished.REC**



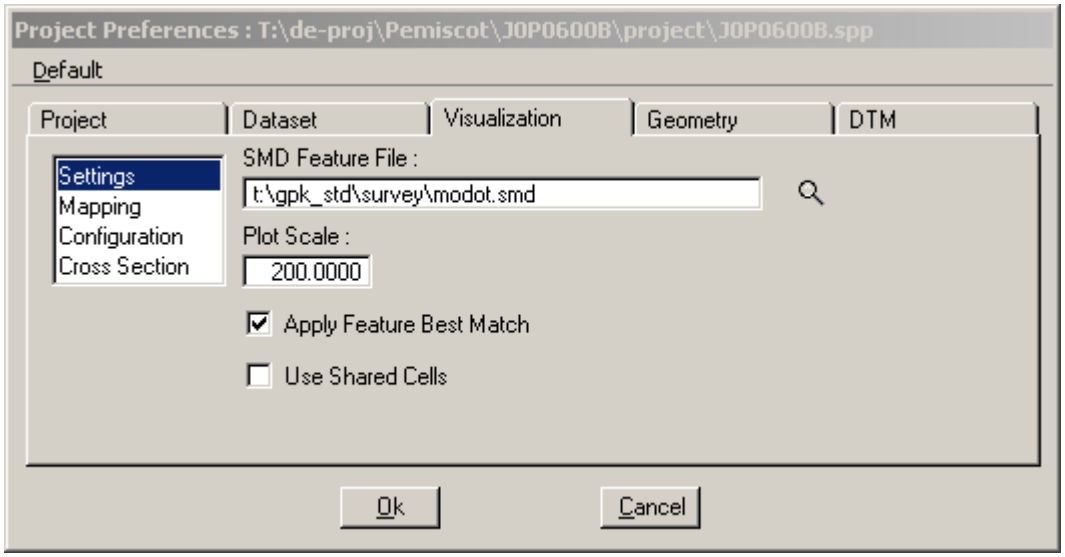
* 25) When you compare the Original and the Finished Tins, the Orginal Tin should completely enclose the Finished Tin. In our class example this is not the case. In the areas where the Finished Tin is outside the Original Tin there will be no Earthwork calculated.



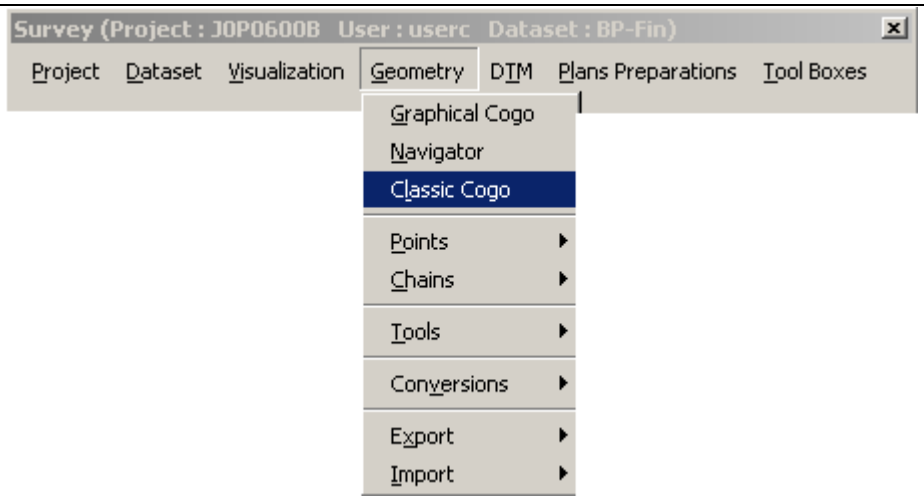
26) In the Survey menu bar select **Project** > **Preferences**



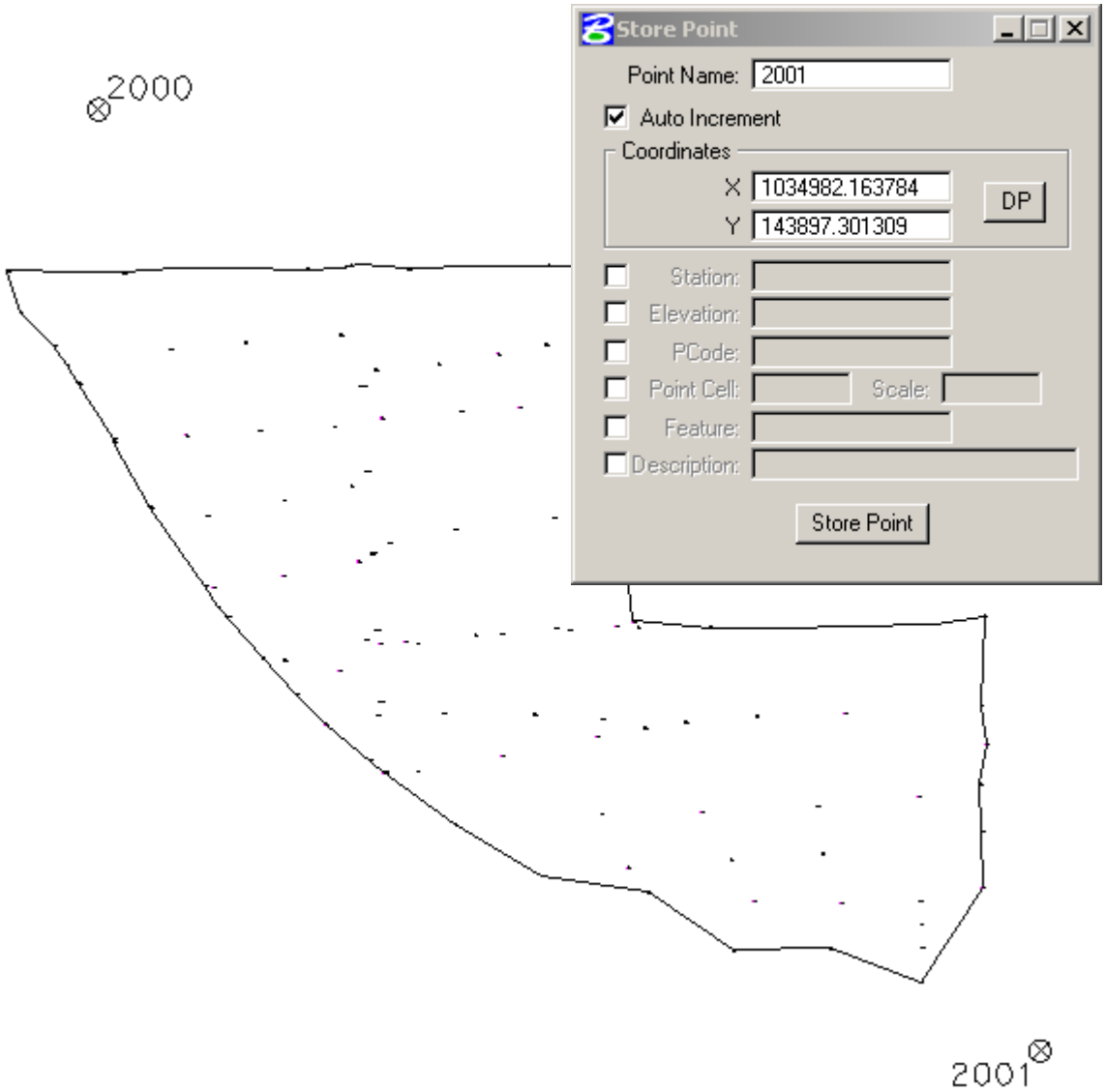
27) Under the **Visualization Tab** select "Setting" and set the **Plot Scale = 200** and the hit the "**OK**" button.



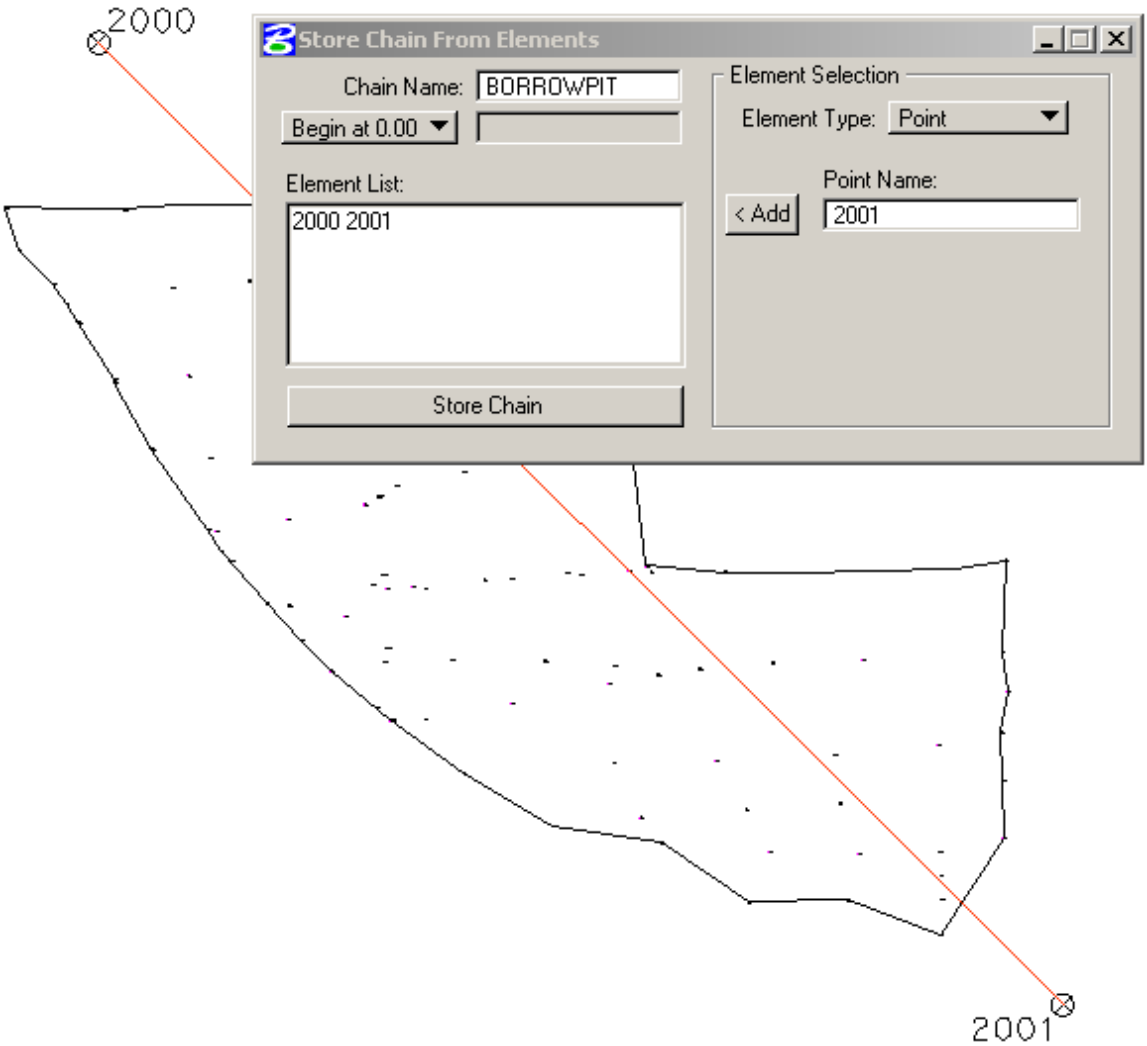
28) Next, we need to create a chain that runs the length of the Borrow Pit. To do this we need to open Coordinate Geometry. To open up Coordinate Geometry go to the Survey Menu bar and select **Geometry** > **Classic Cogo**


Survey (Project : J0P0600B User : userc Dataset : BP-Fin)
Project
Dataset
Visualization
Geometry
DTM
Plans Preparations
Tool Boxes
Graphical Cogo
Navigator
Classic Cogo
Points
Chains
Tools
Conversions
Export
Import

29) Place 2 points at each end of the Borrow Pit (See below).



30) Create a GeoPak Chain that includes the points, 2000 and 2001 (See below).

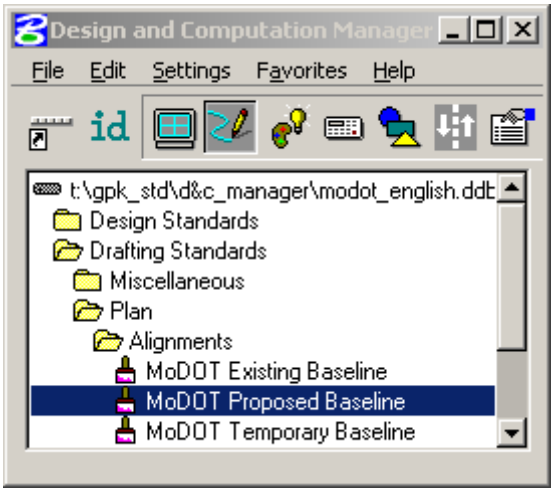


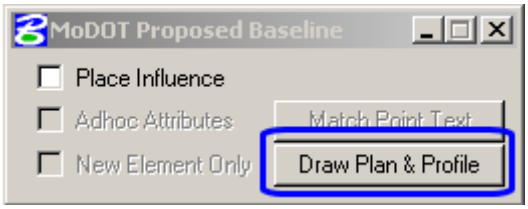

```
Chain BORROWPIT contains:
 2000 2001

Beginning chain BORROWPIT description
==============================================================

Point 2000  X   1,033,269.59 Y  145,609.88 Sta    0+00.00

Course from 2000 to 2001 S 45° 00' 00" E Dist 2,421.95

Point 2001  X   1,034,982.16 Y  143,897.30 Sta   24+21.95

==============================================================
```

Ending chain BORROWPIT description

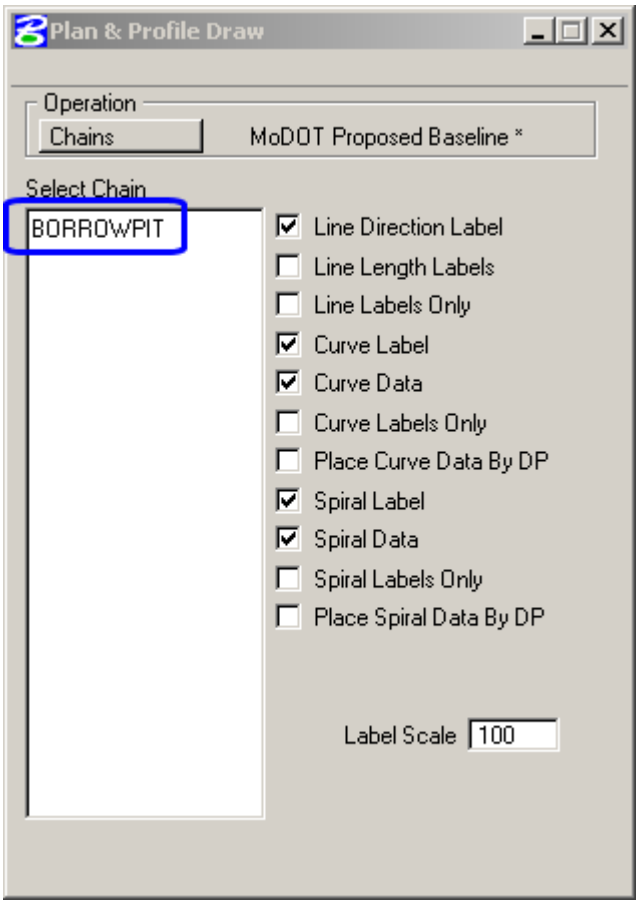
31) **Optional Step** – Plotting Chain and Stationing information permanently into a MicroStation file (MoDOT Standards). To do this select the following:

Applications > GeoPak Road > Design & Computation Manager

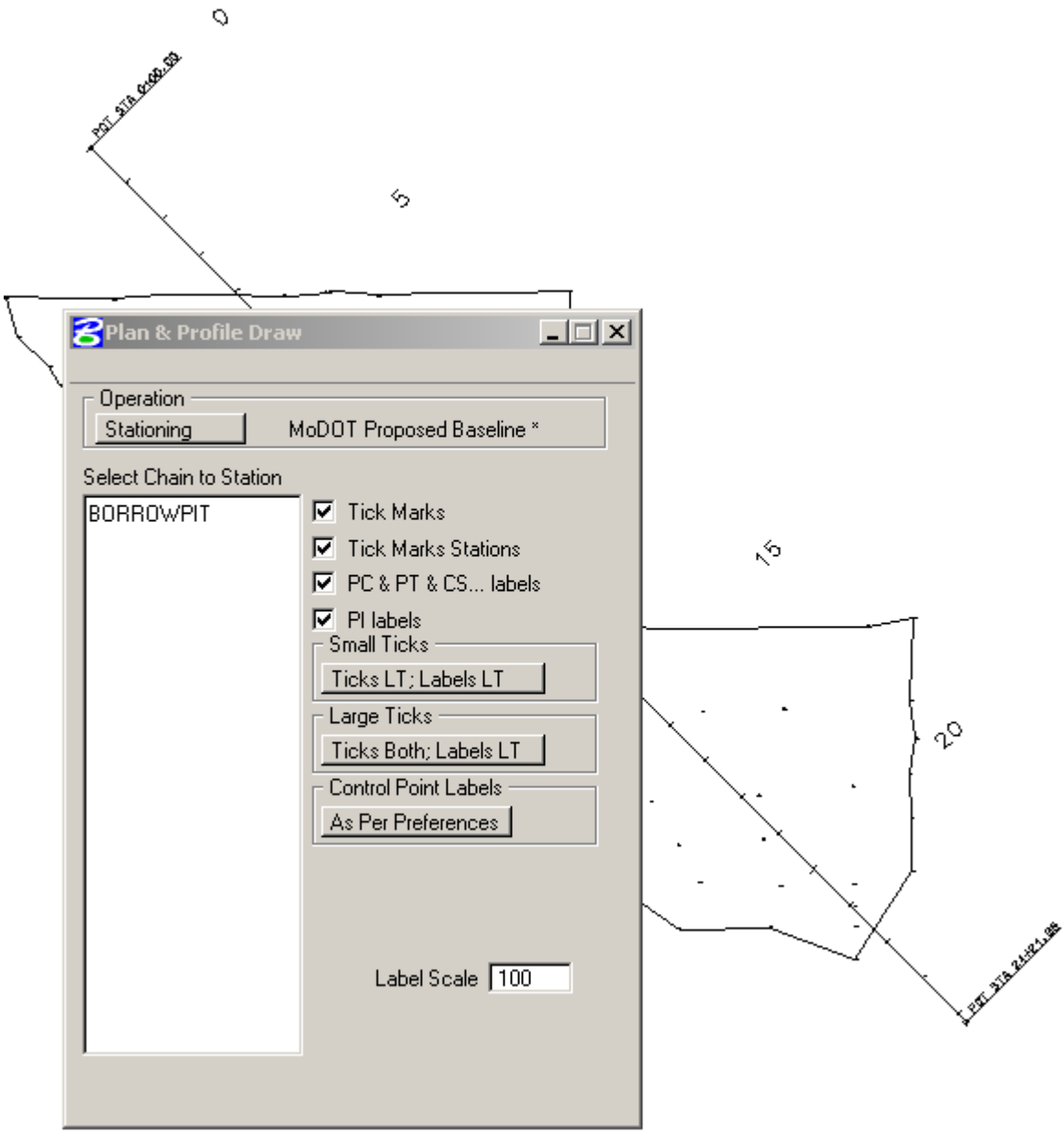




Set the Operation to "**Chains**" and then once and only once the **BORROWPIT** Chain



31 Continued) Switch the **Operation** from Chains to **Stationing.** Make sure the **Large Ticks** option is set to **Ticks Both Labels LT.**



32) Open the following MicroStation file:

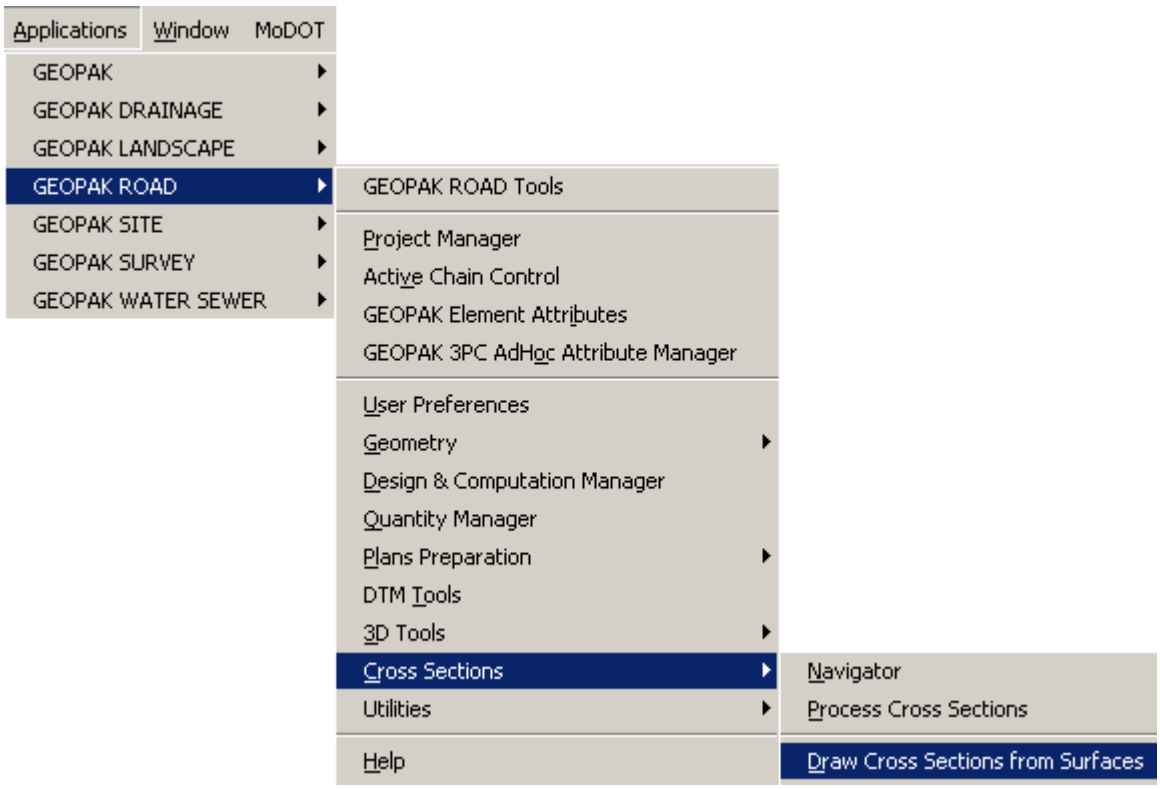
T:\de-proj\Pemiscot\J0P0600B\data\xs_J0P0600B.dgn

Save the MicroStation file as **xs_J0P0600B_Borrow-Pit.dgn**

Close GeoPak Survey

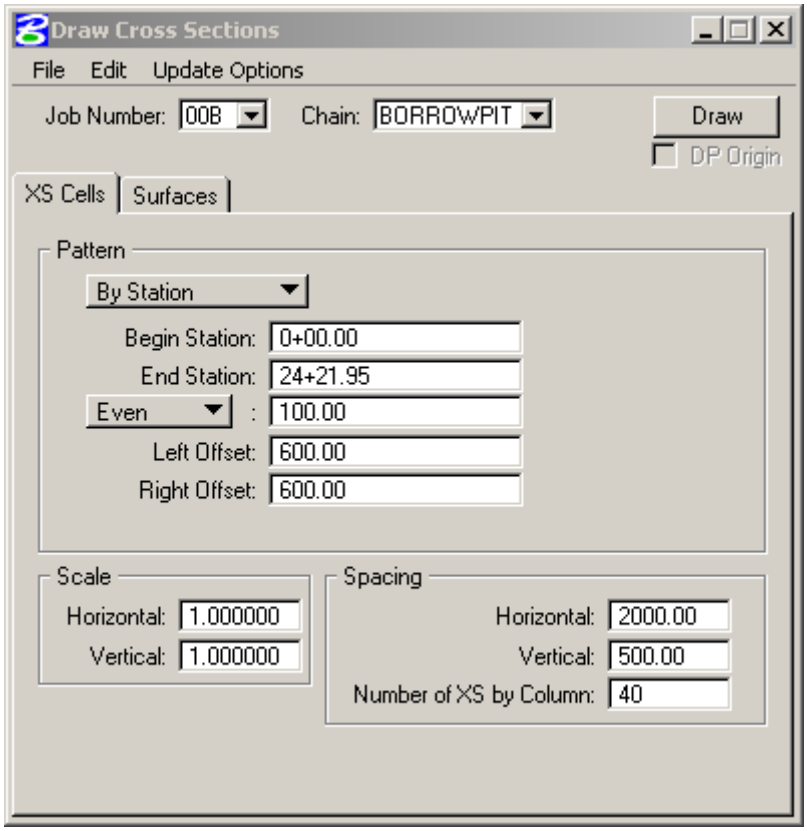
33) Next we need to cut Cross Sections, select the following:

Applications > GeoPak Road > Cross Sections > Draw Cross Sections from Surfaces

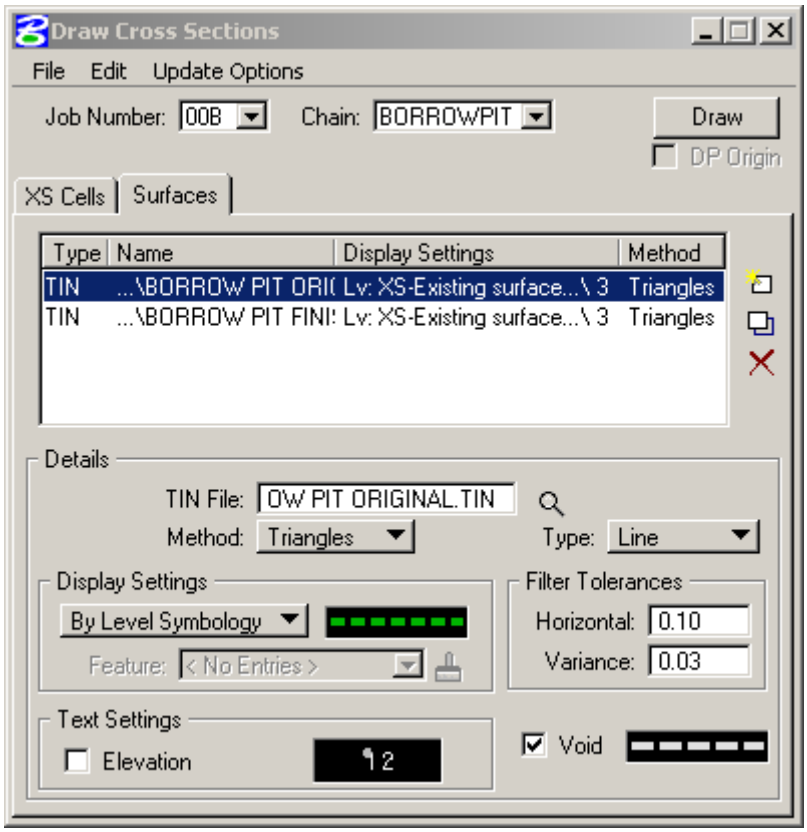


34) When now need to set the **Draw Cross Sections** Dialog as follows:

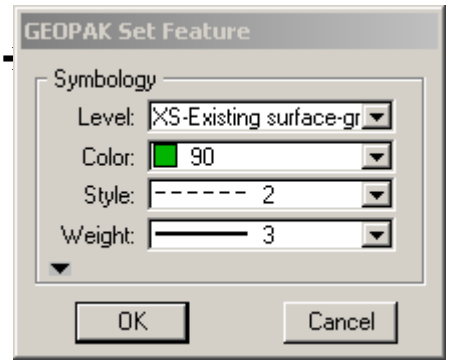
Job Number = 00B
Chain = BORROWPIT
Pattern = By Station
Left & Right Offset = the widest distance from the Chain to the outer limits of the tin.
Horizontal Spacing = Must be greater than the Left & Right Offset distance combined.



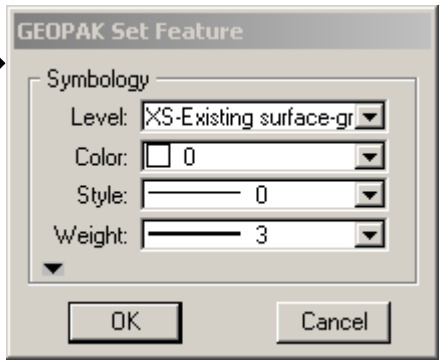
35) Select the Surfaces Tab and set up the dialog as below:



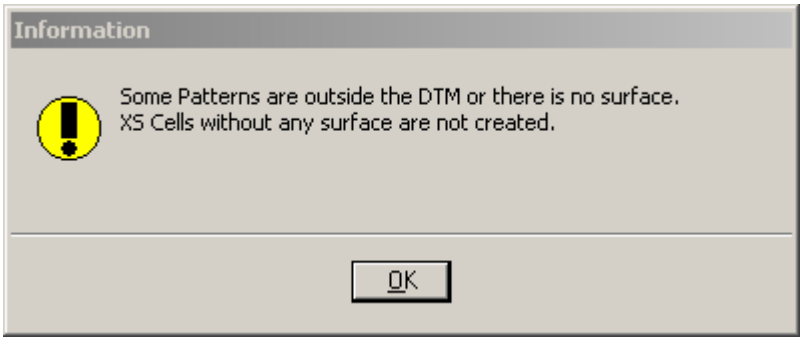
Borrow Pit Original Symbology →



Borrow Pit Final Symbology ➔

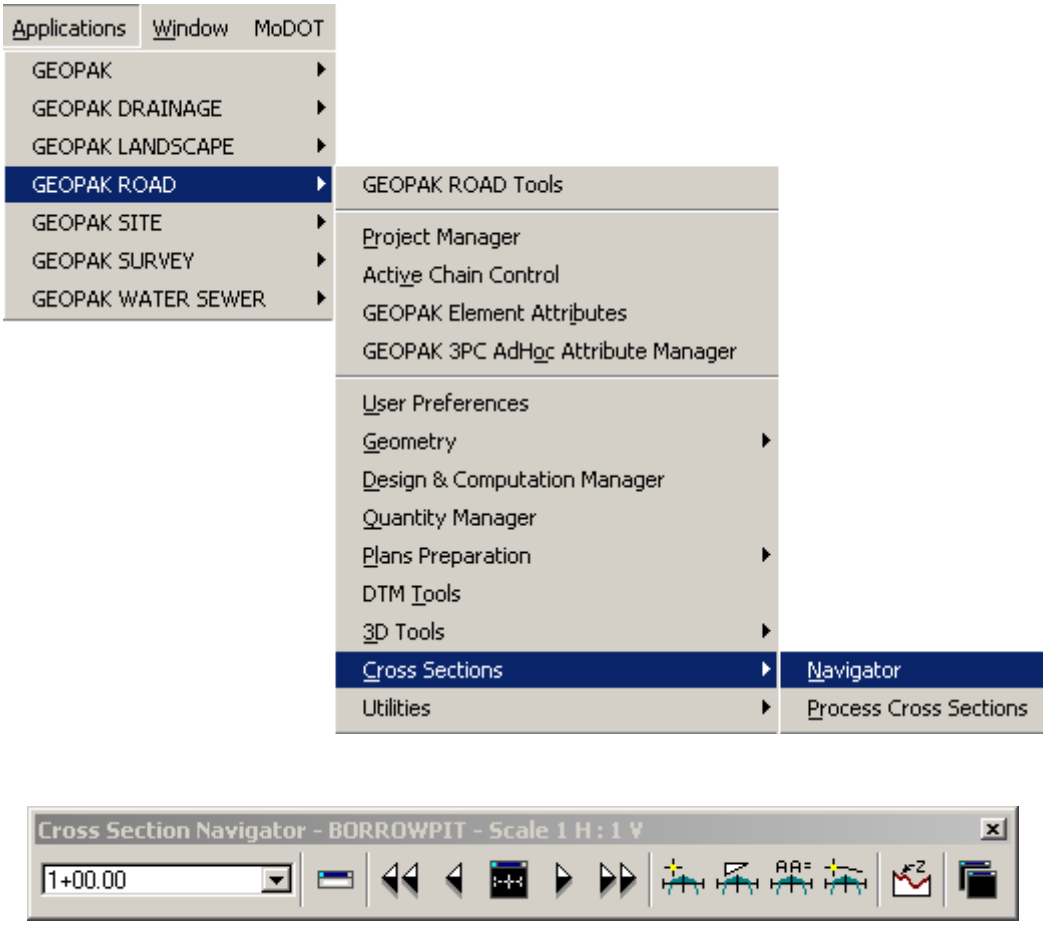


36) Once the Dialog is filled out, select the **Load** button in the upper right corner. Select "**OK**" to the informational dialog below.

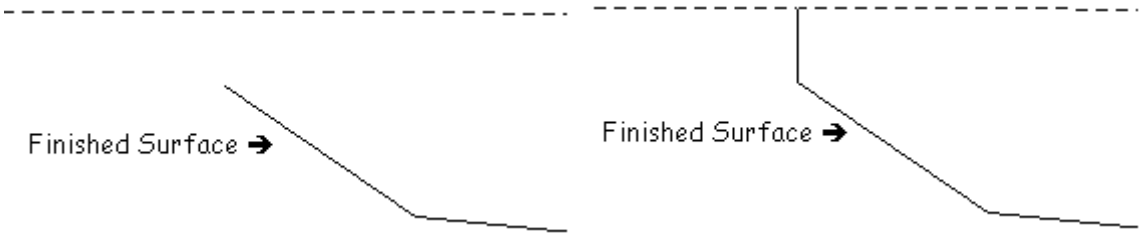


37) Open up Cross Section Navigator buy selecting the following:

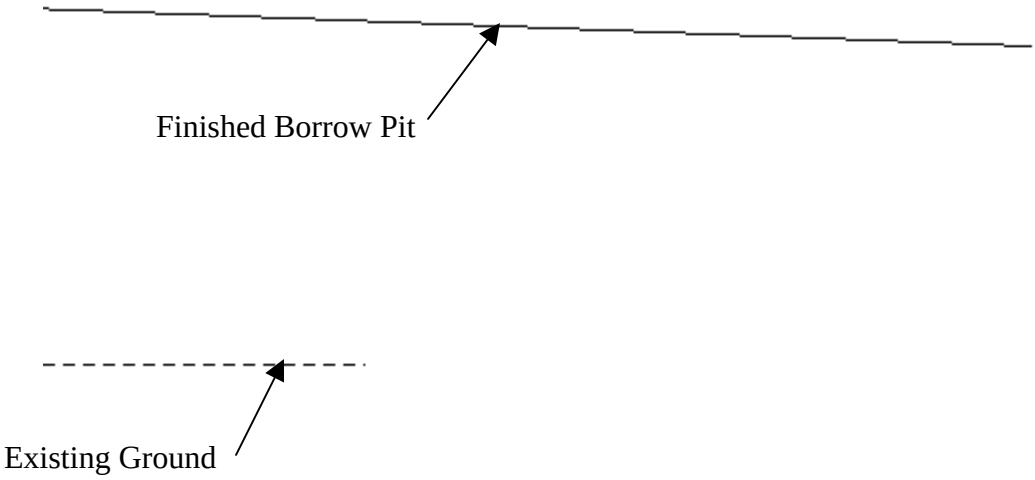
Applications > GeoPak Road > Cross Sections > Navigator



38) Once the Cross Sections are plotted, we need to make sure the finished Surface connects to the Original Surface. Use the MicroStation "**Place line Tool**" to connect the two surfaces. Also use the following symbology for the place line tool.

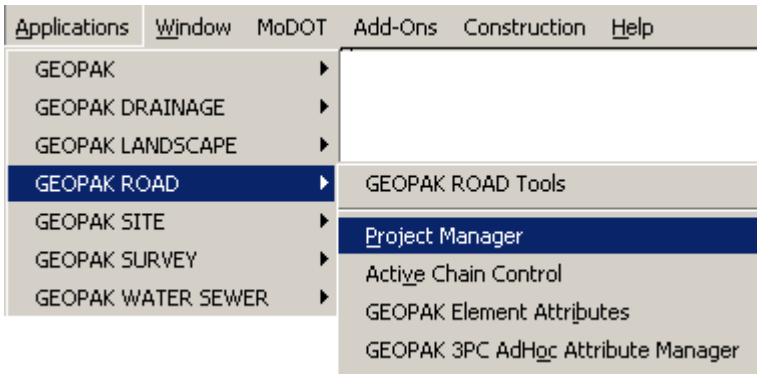


******* The Finished Borrow Pit Surface cannot go past the end of the Existing (Original) Ground Line (See Below).

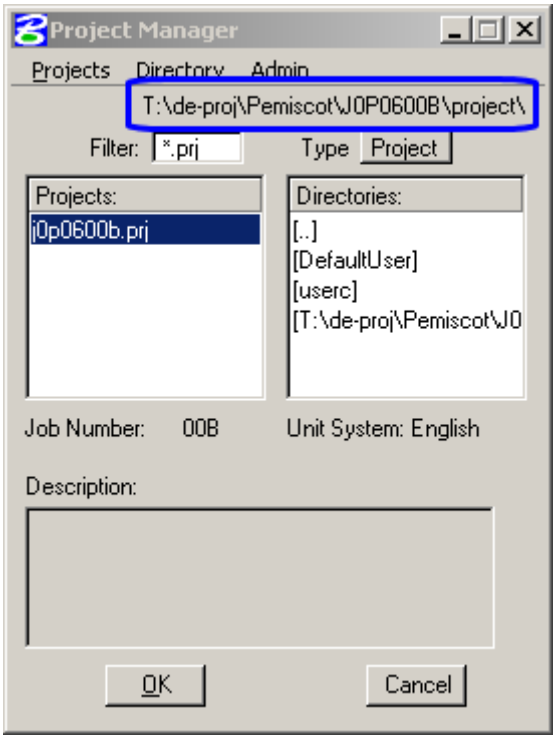


39) Now that the Cross Section are complete, let's run **Earthwork** by selecting the following:

Applications > GeoPak Road > Cross Sections > Project Manager

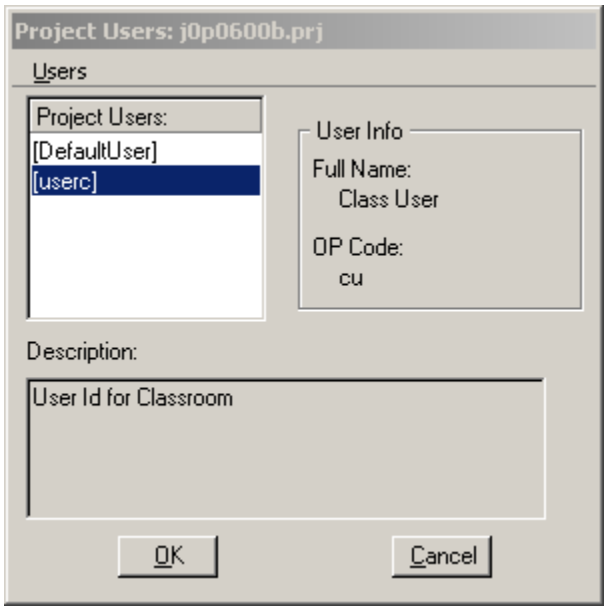


Set the path in the Project Manager to **T:\de-proj\Pemiscot\J0P0600B\project**

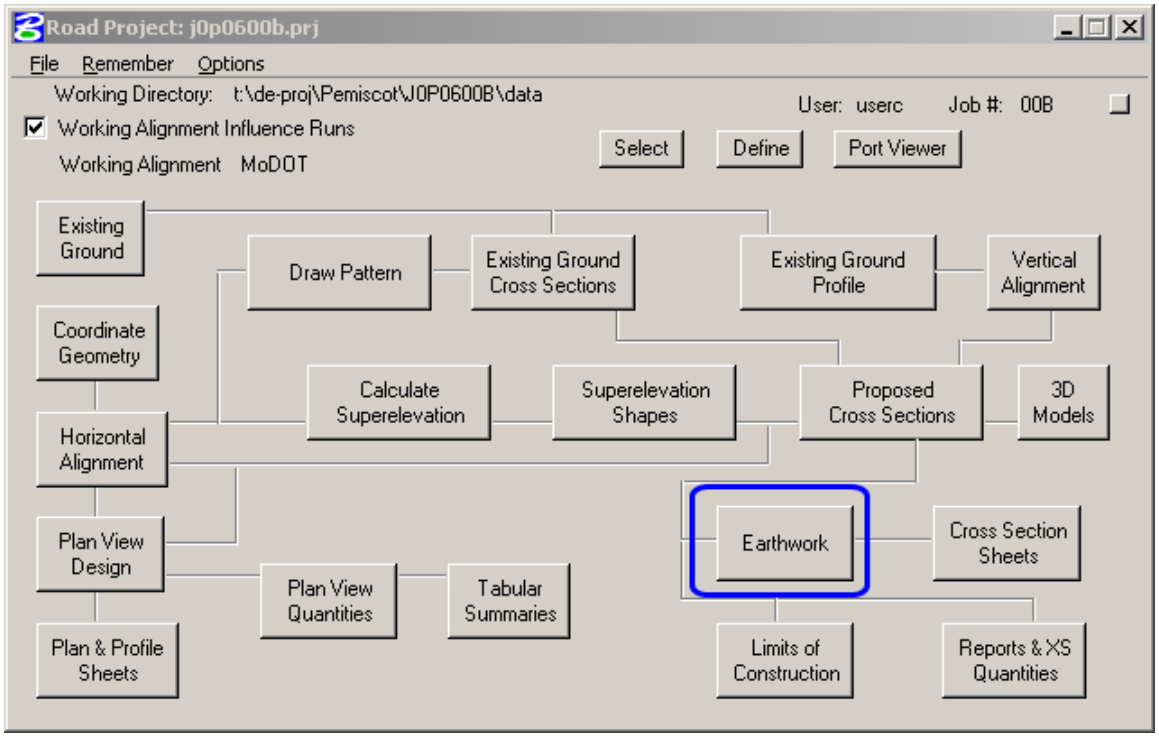


Once the path is set, select "**OK**"

40) From the **Project Users** Dialog, select "**Userc**"

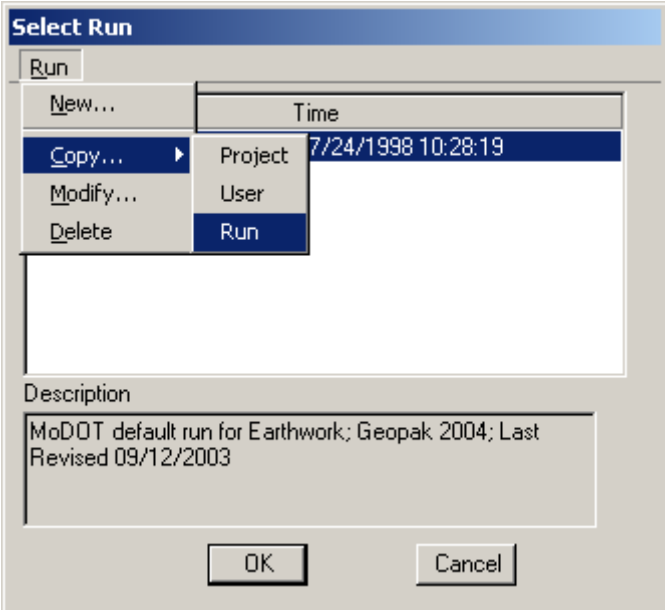


41) From the Road Dialog, select "Earthwork"

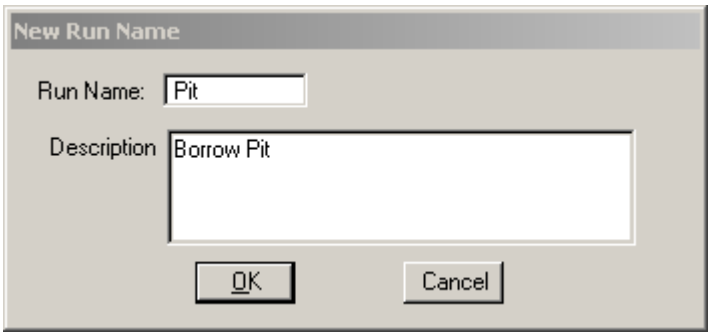


42) After selecting Earthwork, the Select Run Dialog will pop up. To create a New Run select the following:

Run > Copy > Run



Select the "**MoDOT**" Run to Copy and call the new Run "**Pit**"

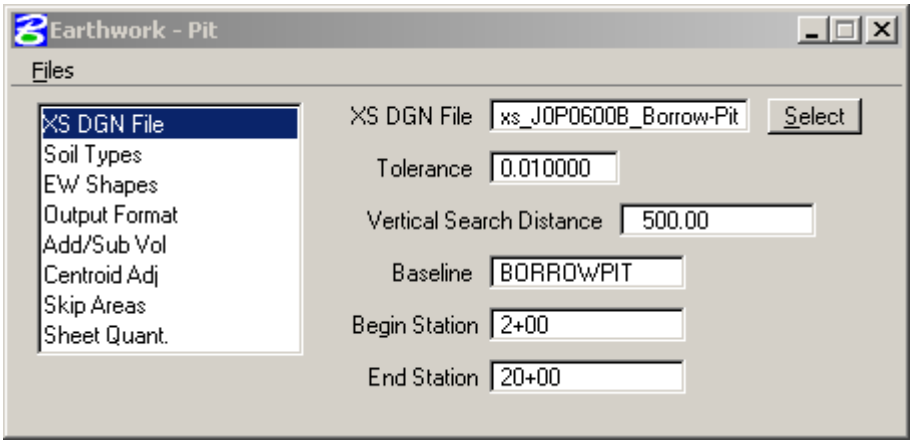


After filling out the Run Name and Description, select "**OK**"

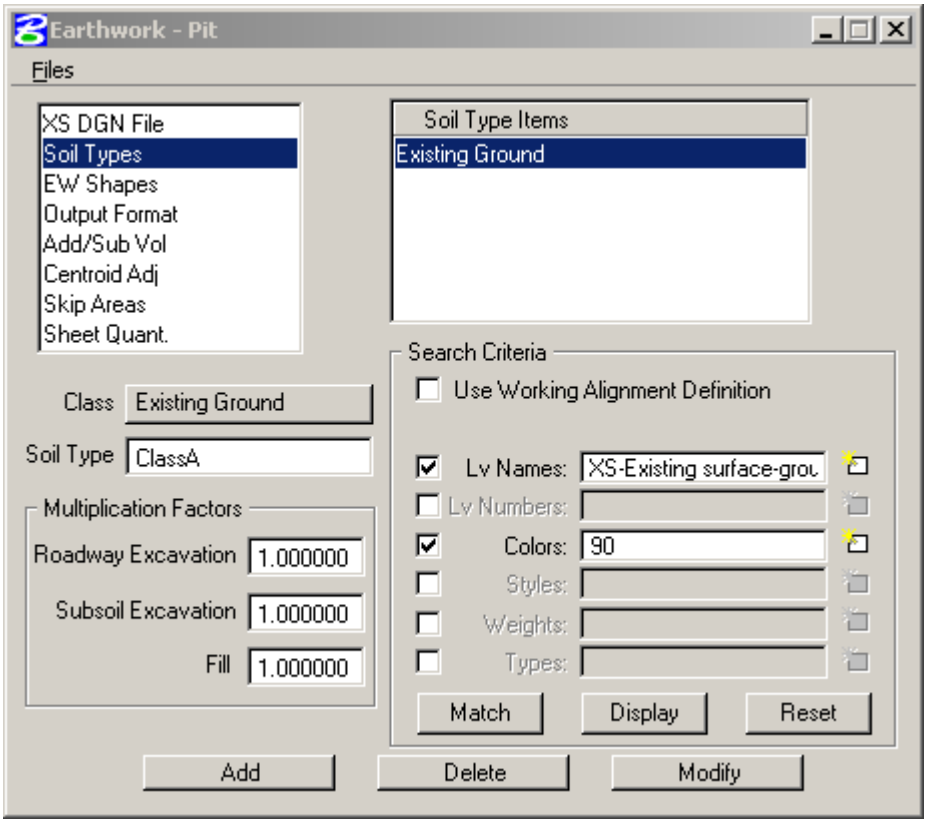
Once the run is created, select the "**Pit**" run to go into the Earthwork Tool.

43) XS DGN File – Using the Select button chose **xs_J0P0600B_Borrow-Pit.dgn**. This file has our Cross Sections plotted in it.

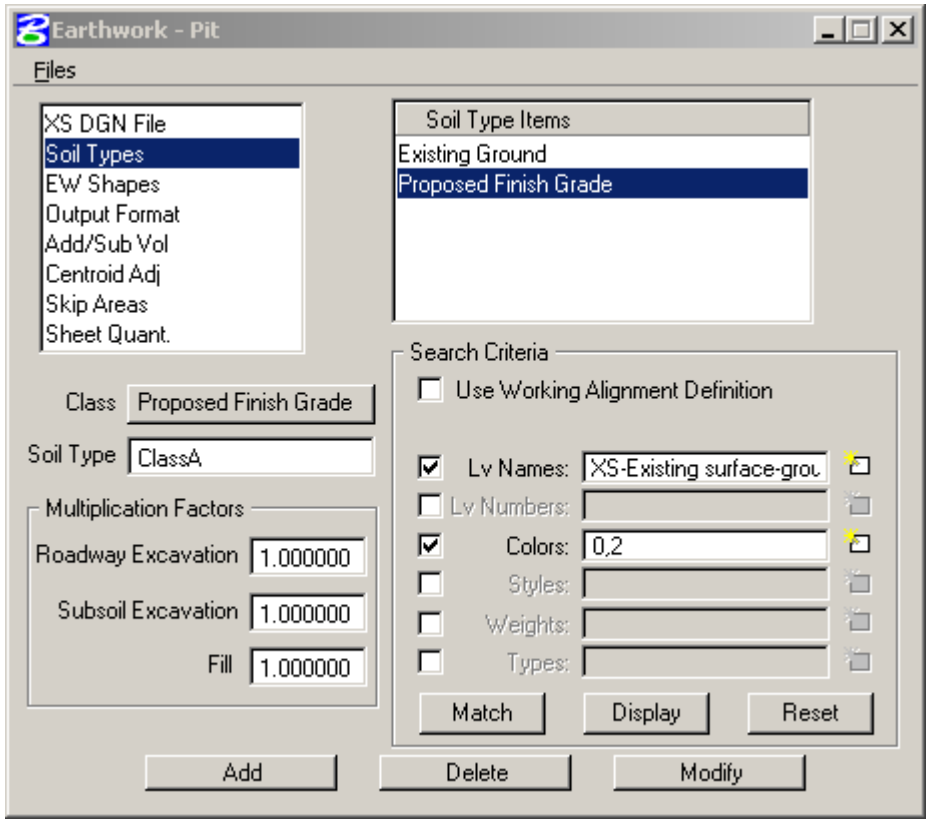
Modify the **Beginning** and **End** Stations to match your Cross Sections.



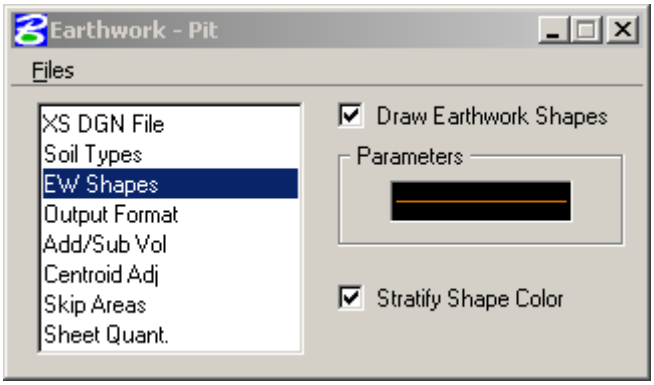
44) **Soil Types Existing Ground** - This section is used to define the soil types in the Cross Section File. First, we'll define the Existing **Ground**.

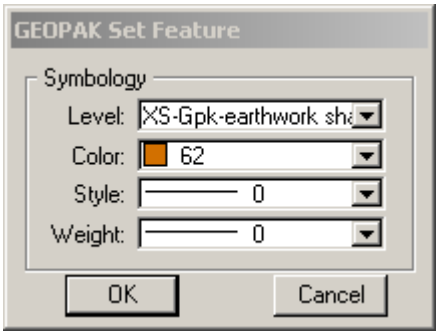


45) **Soil Types Proposed Finished Grade** - This section is used to define the soil types in the Cross Section File.

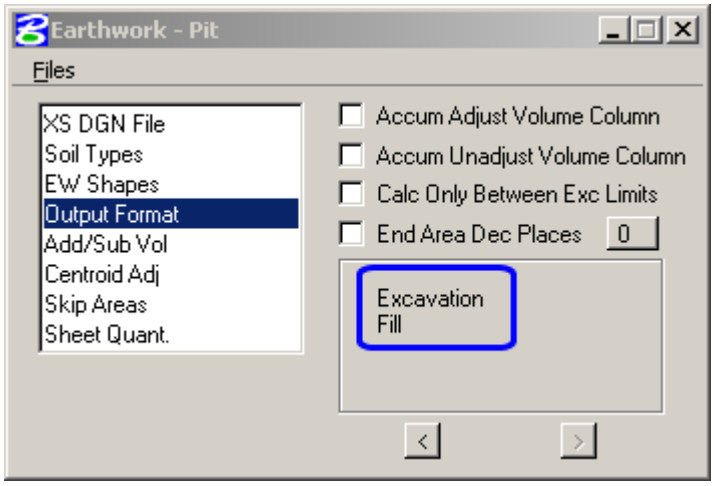


46) EW Shapes – Check on **Draw Earthwork Shapes** and Stratify **Shape Color**.





47) Output Format – Use the arrows at the bottom of the dialog until Excavation and Fill are the only options displayed.

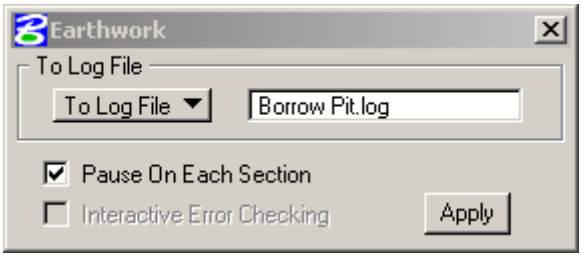


48) Go to the "**File**" Pull-down and select "**Save Settings**".

Then again go to the "**File**" Pull-Down and select "**Run**".

49) In the **Earthwork Run dialog** change the Log file option from **Screen Only** to **Log File**.

Call the Log file **Borrow Pit.Log**




```
G R A N D     S U M M A R Y     T O T A L S
       Material Name          Unadjusted Adjusted   Mult
                              Volumes    Volumes    Factor
                              (cu. yd.)  (cu. yd.)
---------------------------- ---------- ---------- ------
CLASSA
                   Excavation     227499     227499   1.00
                     Fill            799        799   1.00
```