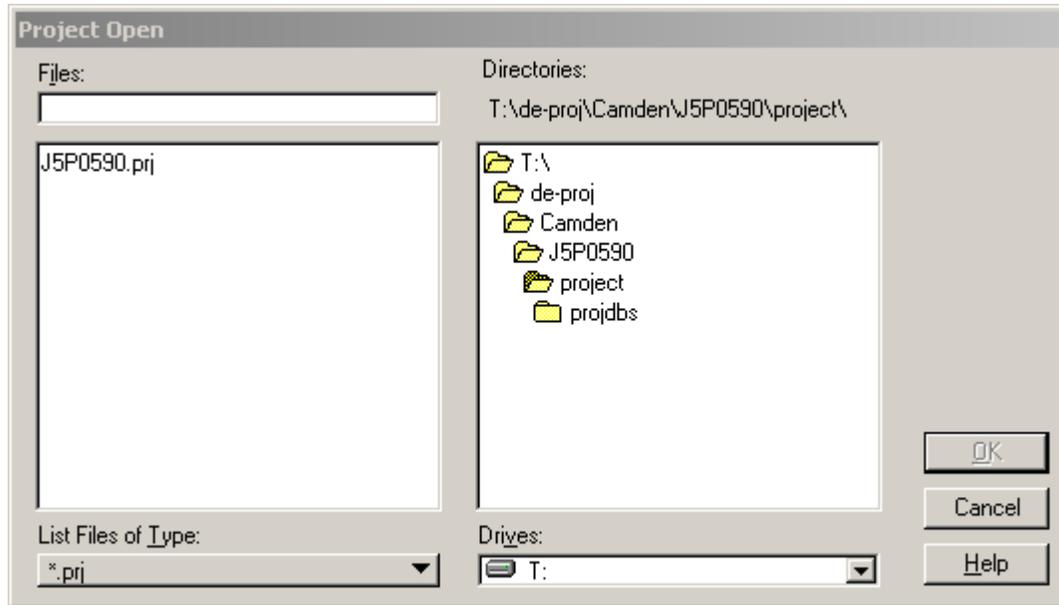


Rock Excavation (End Area Method)

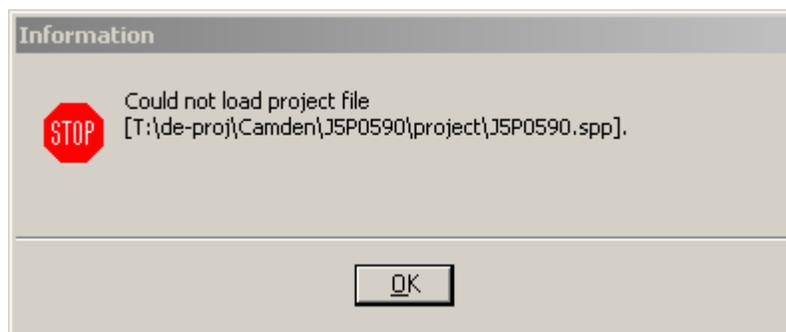
1) Open **T:\de-proj\Camden\J5P0590\data\plan_J5P0590.dgn**

2) Select the **Applications > GeoPak Survey > Survey** and navigate to the **T:\de-proj\Camden\J5P0590\project** folder.

a. Select the **J5P0590.prj** file.

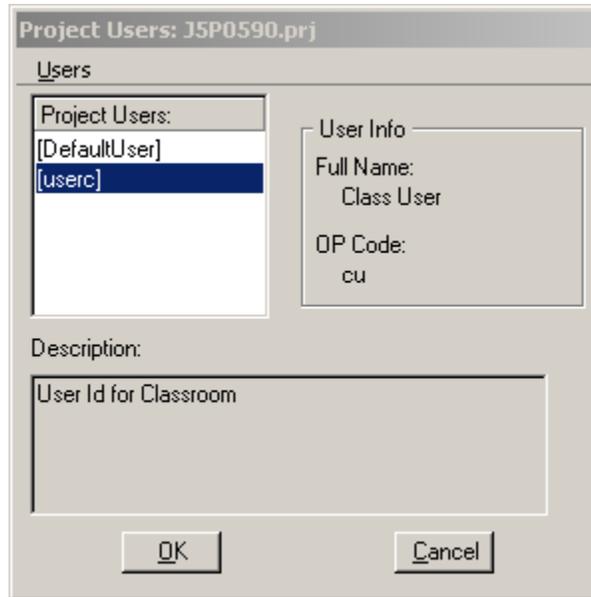


3) Select “**OK**” to the following dialog box.

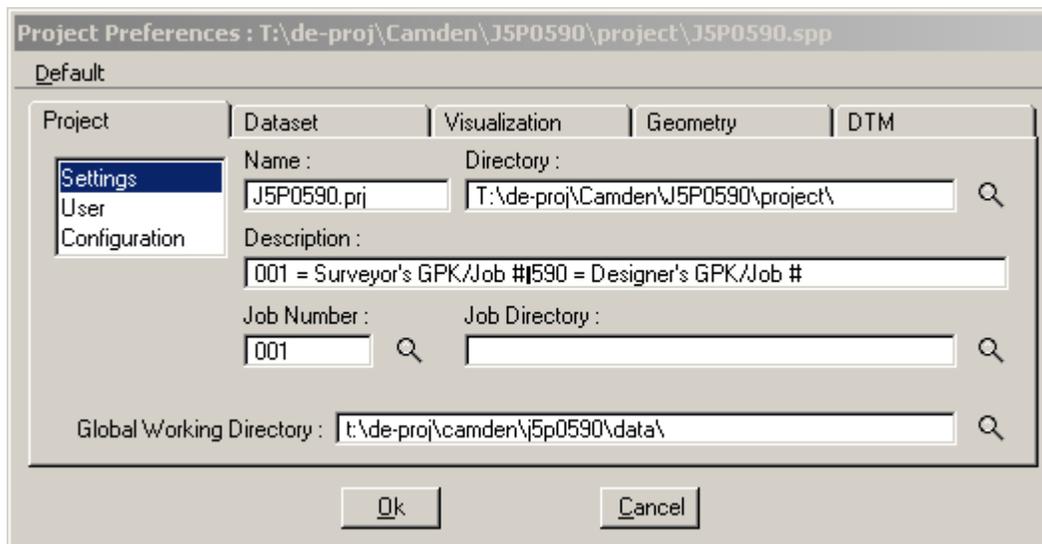


Rock Excavation (End Area Method)

4) Select “userc” as the Project User.

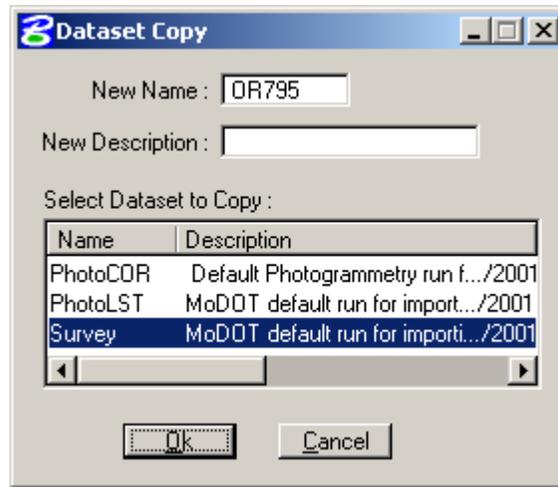


5) From the Survey Menu Bar select **Project > Preferences** and make sure Job Number/GPK is set to **001**.



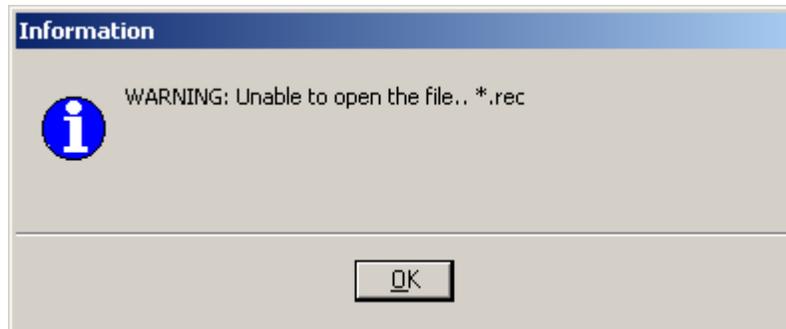
Rock Excavation (End Area Method)

6) From the Survey Menu select Dataset > Copy and copy the default **Survey** run and create a new run called **OR795**. Once the run is created, select the run and go into it.



Click "OK" to the Information dialog box that states "**WARNING: Unable to open the file. *.rec**"

What is happening here is that GeoPak is looking on the root directory of the t:\ drive and is not finding any rec file.

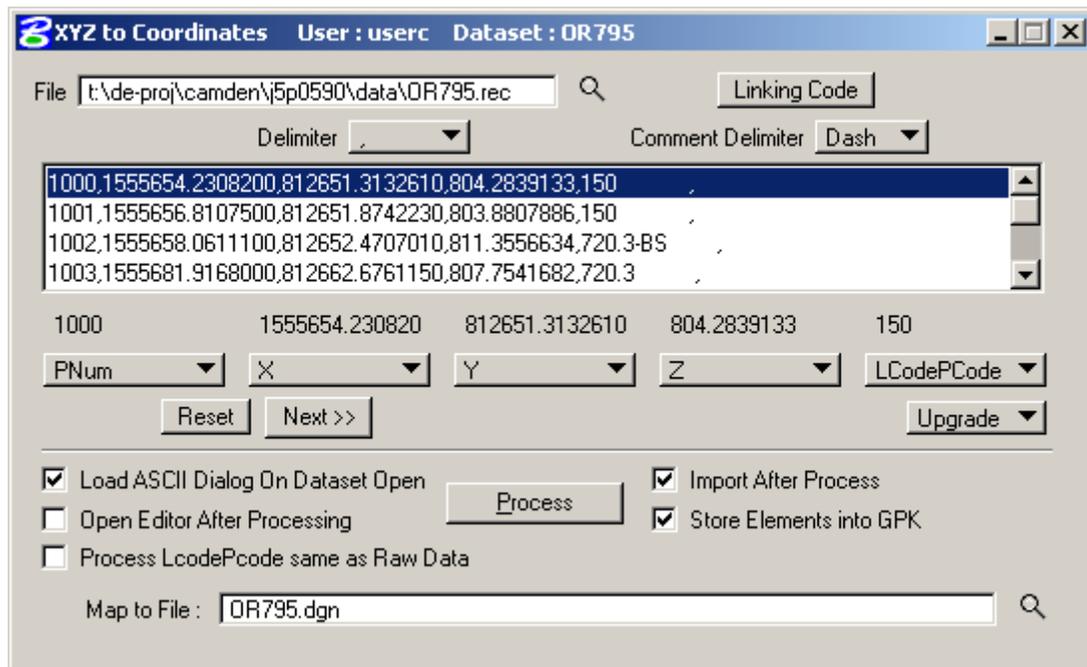


7) In the Survey Project Dialog using the File button select the following REC file:

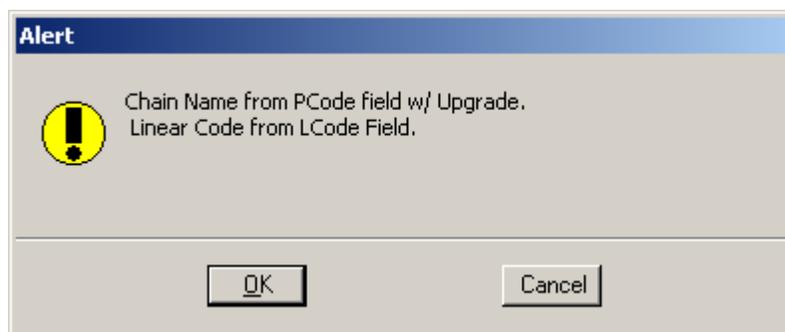
T:\de-proj\Camden\J5P0590\data\OR795.REC

Rock Excavation (End Area Method)

- 8) Select the **first line** of data from the REC file.
 - a. Always make sure that the REC file has no header information in it.
 - b. Set the DGN File to **OR795.dgn** (you'll need to type this in, the file has not been created yet).
 - c. Save your run for future use by selecting **Dataset > Save**.
 - d. Select "**Process**"

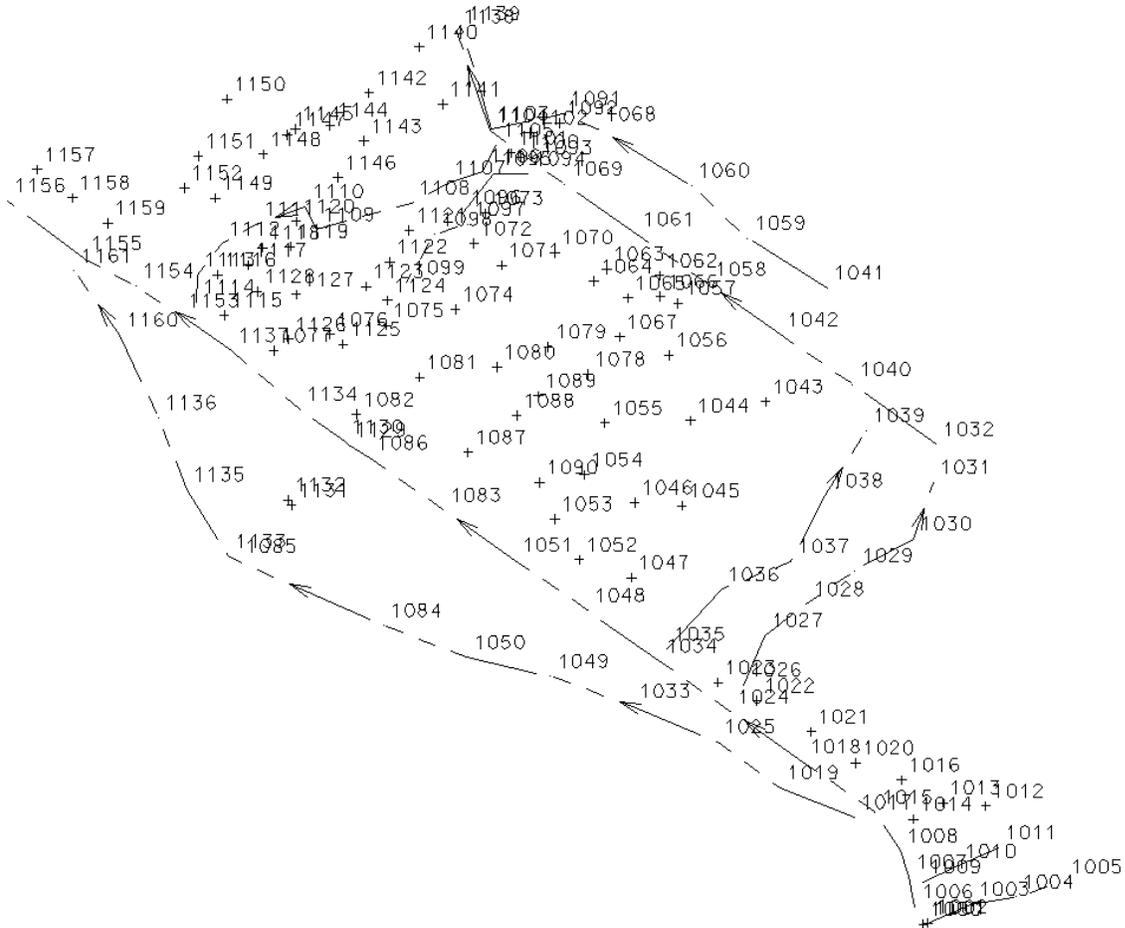


- 9) Select **OK** from the Alert dialog that pops up.



Rock Excavation (End Area Method)

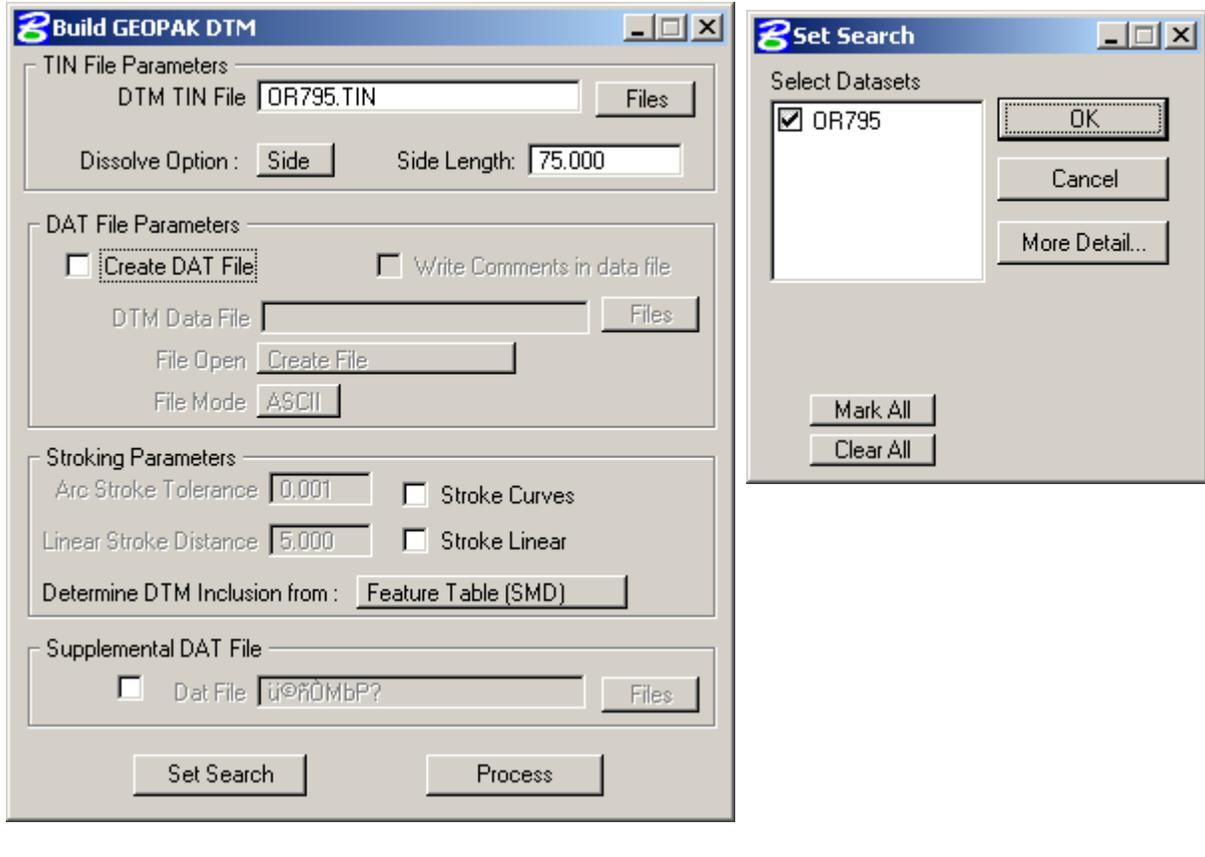
10) Once GeoPak finishes importing and mapping the data, select “Fit View”.



Rock Excavation (End Area Method)

11) Create a tin file called **OR795.tin** for the Survey data.

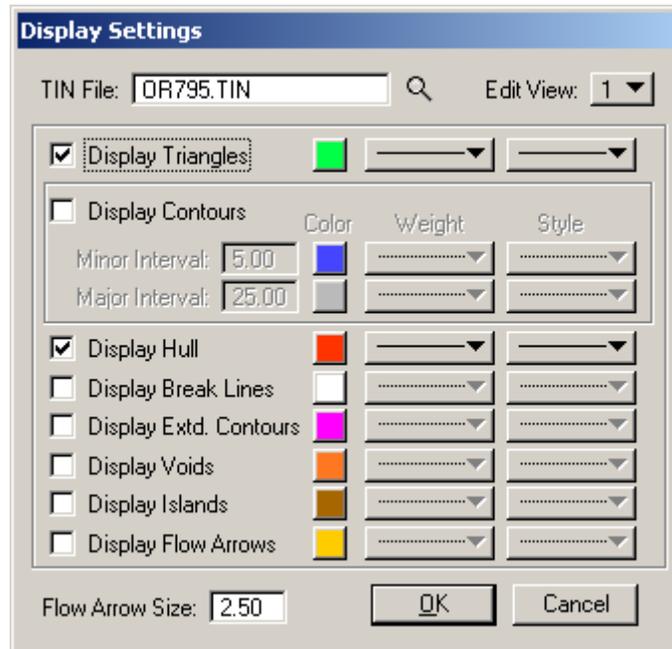
Select DTM > Build DTM > From Survey Data.



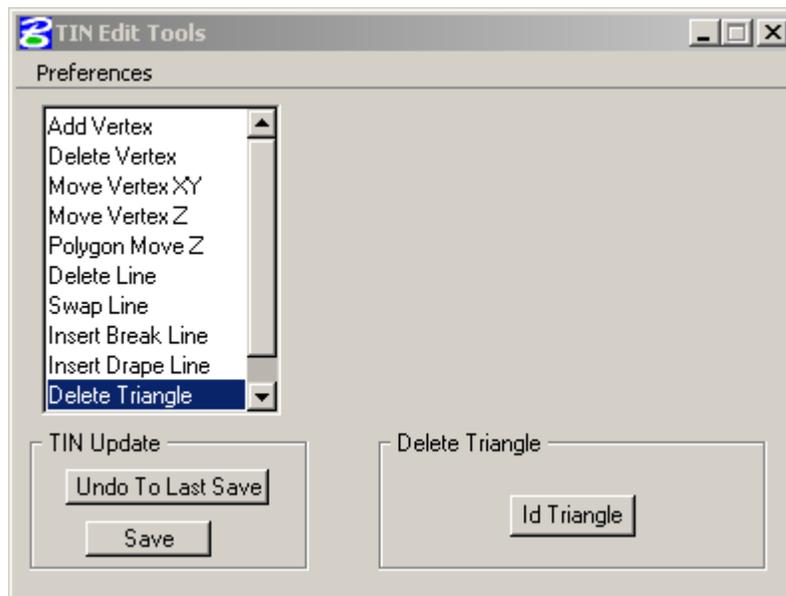
Rock Excavation (End Area Method)

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

Set the **Display Preferences** as below.



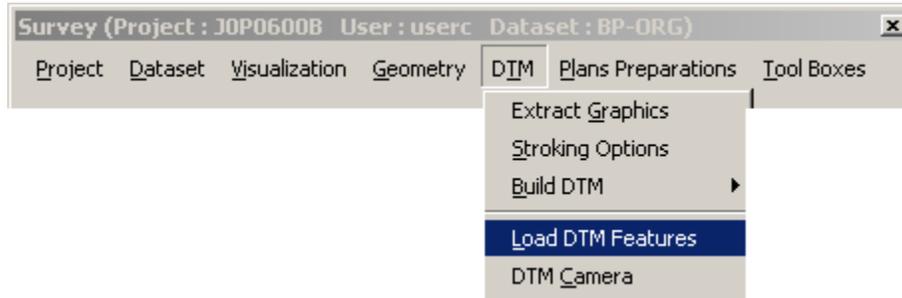
Use the **Delete Triangle** option and remove any Bogus Tin lines on the outside of the Tin.



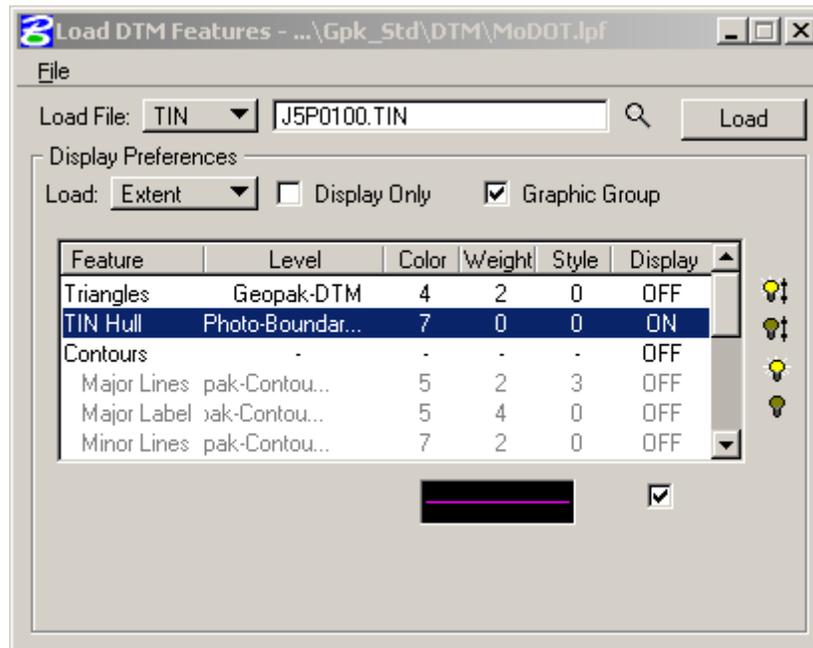
After deleting, the bogus tin legs select “**Save**” and **Close** the Tin Edit tools.

Rock Excavation (End Area Method)

13) Next we are going to plot the Tin Hull (boundaries) of the **J5P0100.Tin**. To do this go to the Survey menu bar and select **DTM > Load DTM**



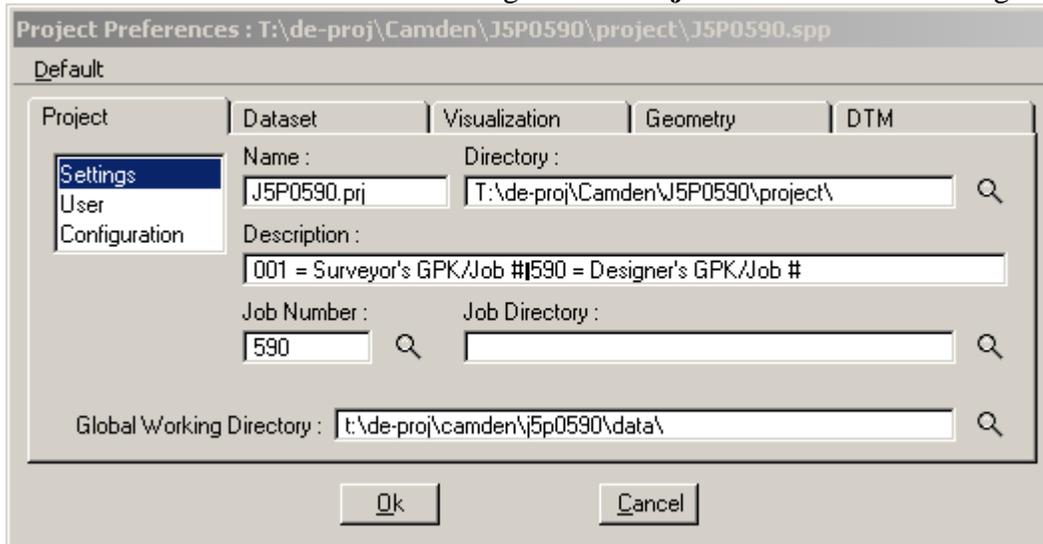
- Within the Load DTM Features set all the Feature Preferences by selecting **File > Open**



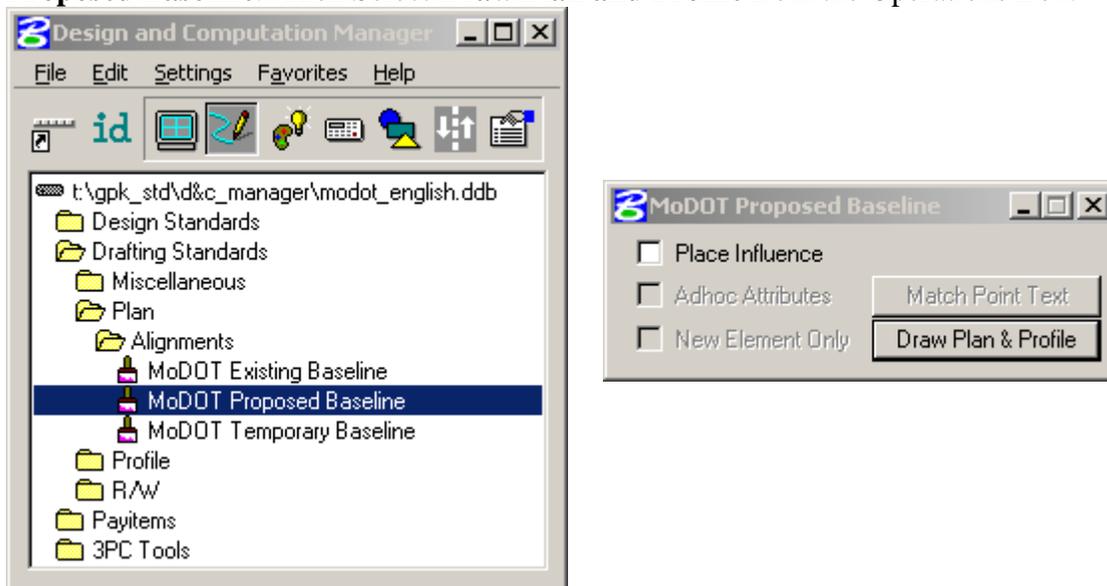
- Select the **MoDOT.LPF** that is located within the data folder.

Rock Excavation (End Area Method)

- 14) Now that we have the Survey Data mapped and the tin file is created, lets compare the survey data to the Route 5 Alignment. To do this lets create a MicroStation dgn file that has the alignment information in it.
- Close out of the **XYZ to Coordinate Dialog**.
 - Open the file **plan_J5P0590.dgn**
 - Switch to the **590** GPK file. To do this go to the **Project > Preferences Dialog**.

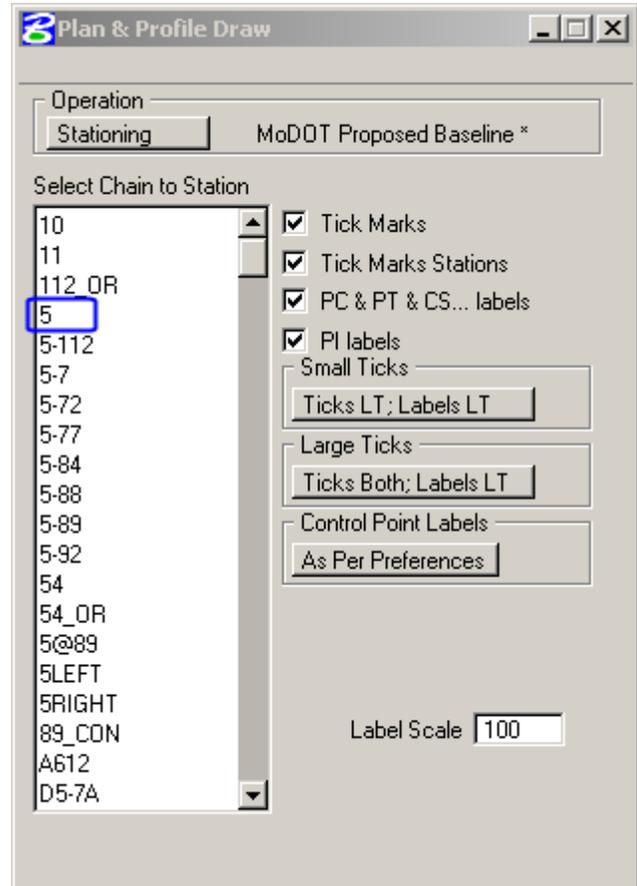
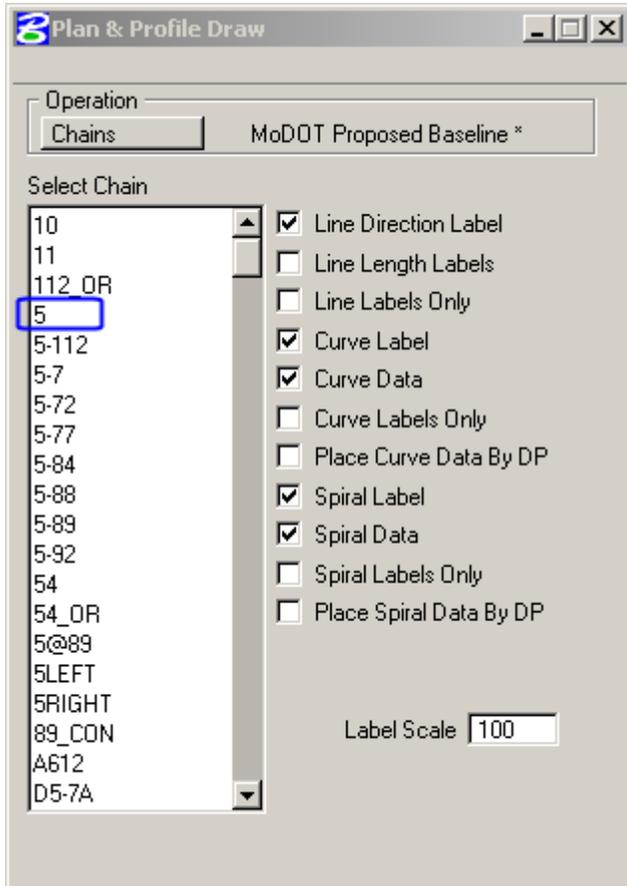


- 15) Open D&C Manager by selecting **Applications > GeoPak Road > Design and Computation Manager**.
- In D&C Manager navigate to **Drafting Standards > Plan > Alignments > MoDOT Proposed Baseline**. Then Select **Draw Plan and Profile** from the Operations Box.



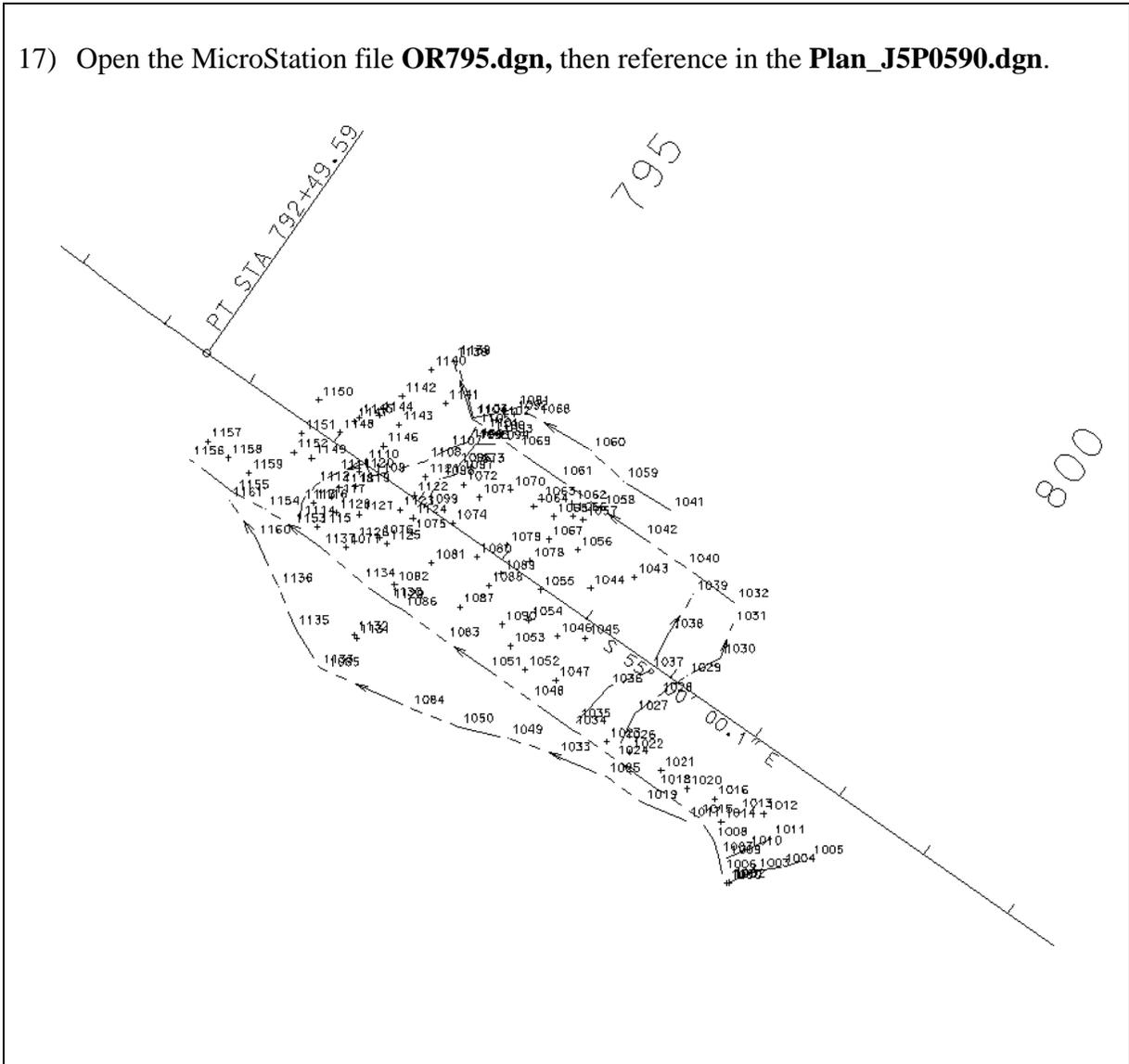
Rock Excavation (End Area Method)

- 16) Change the Operation to Chains and Stationing and Select the chain called 5 once each time.



Rock Excavation (End Area Method)

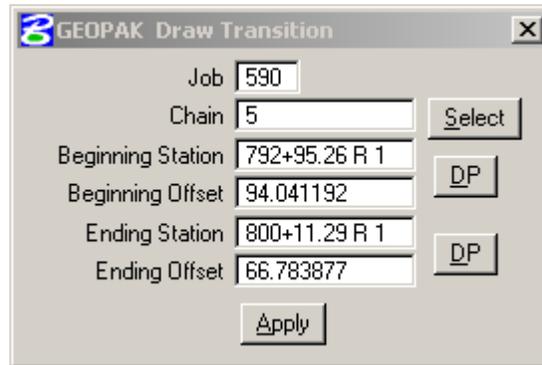
17) Open the MicroStation file **OR795.dgn**, then reference in the **Plan_J5P0590.dgn**.



Rock Excavation (End Area Method)

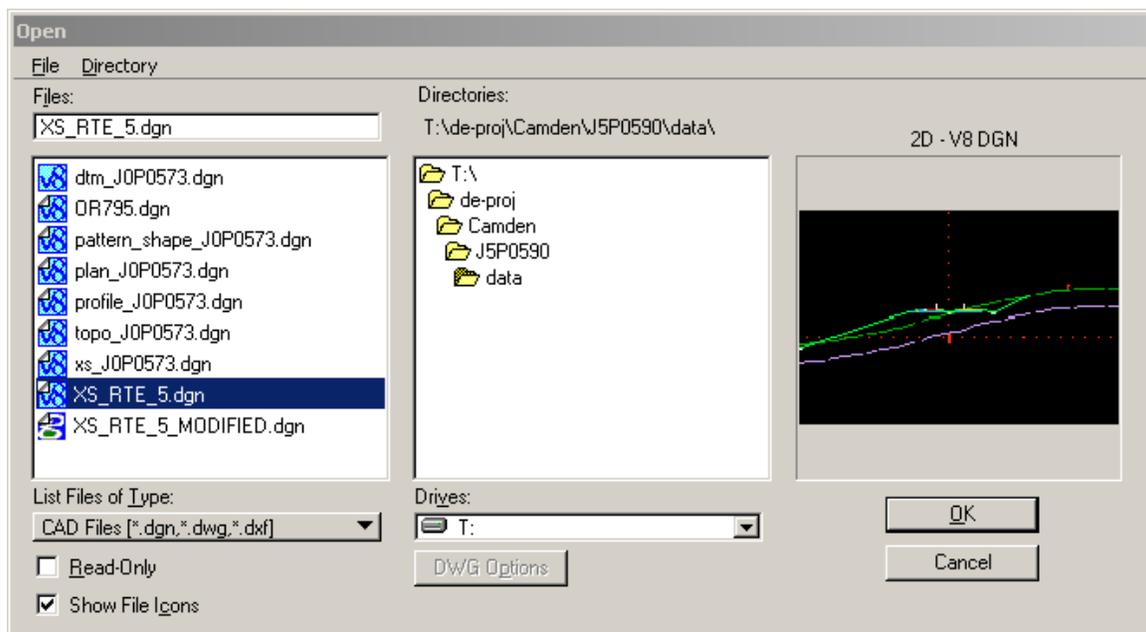
18) Use the GeoPak Road “Draw Transitions” tool to obtain the station values for the “Zero Sections”

- a. To open the **Draw Transition** tool; select **Applications > GeoPak Road > Plans Preparation > Draw Transition**



19) Open T:\de-proj\Camden\J5P0590\data\XS_RTE_5.dgn

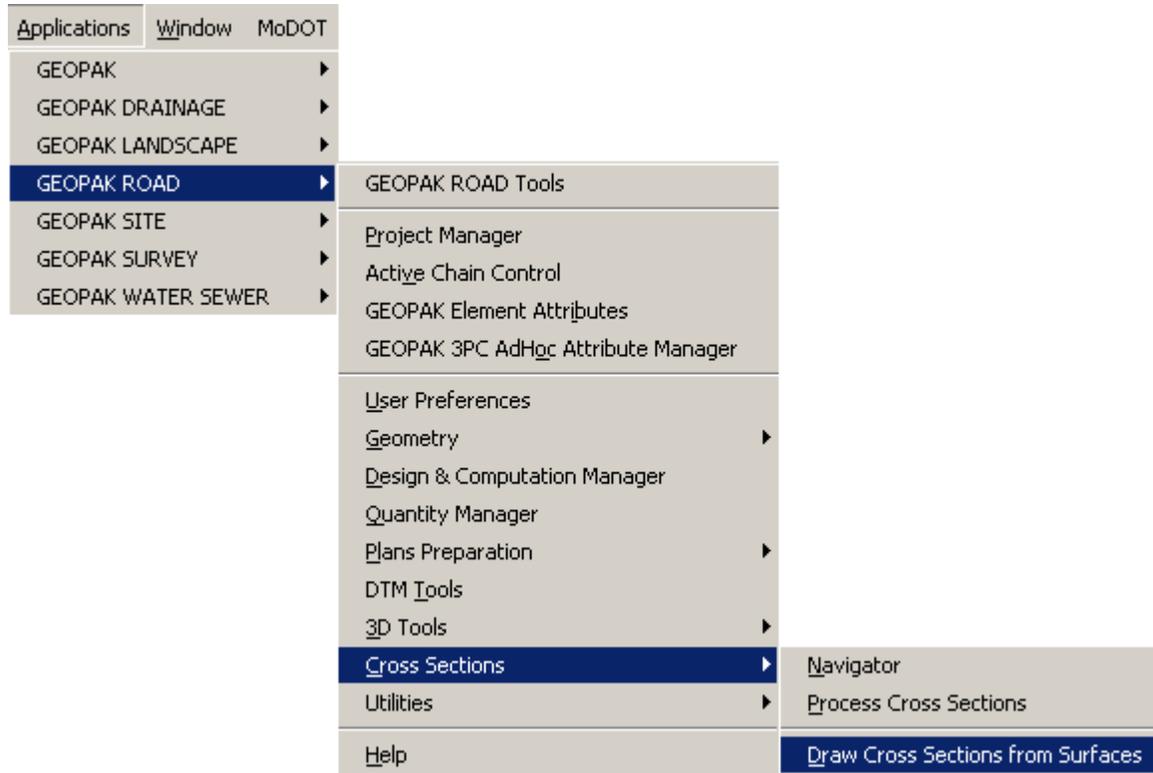
This file has the Designer’s Cross-Sections in it.



Rock Excavation (End Area Method)

21) Next, we need to Add in the **Surveyor's Rock Surface** to the Designer's Cross Sections, select the following:

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



Rock Excavation (End Area Method)

22) We now need to set the **Draw Cross Sections** Dialog as follows:

Job Number = 590
Chain = 5
Pattern = In Existing Only

*** The Designer's Cross Sections are 1200 ft wide, therefore we'll need to adjust the Horizontal spacing to something larger than that, say 2000 ft.

Draw Cross Sections

File Edit Update Options

Job Number: 590 Chain: 5 Draw

DP Origin

XS Cells Surfaces

Pattern

In Existing Only

Scale

Horizontal: 1.000000

Vertical: 1.000000

Spacing

Horizontal: 2000.000

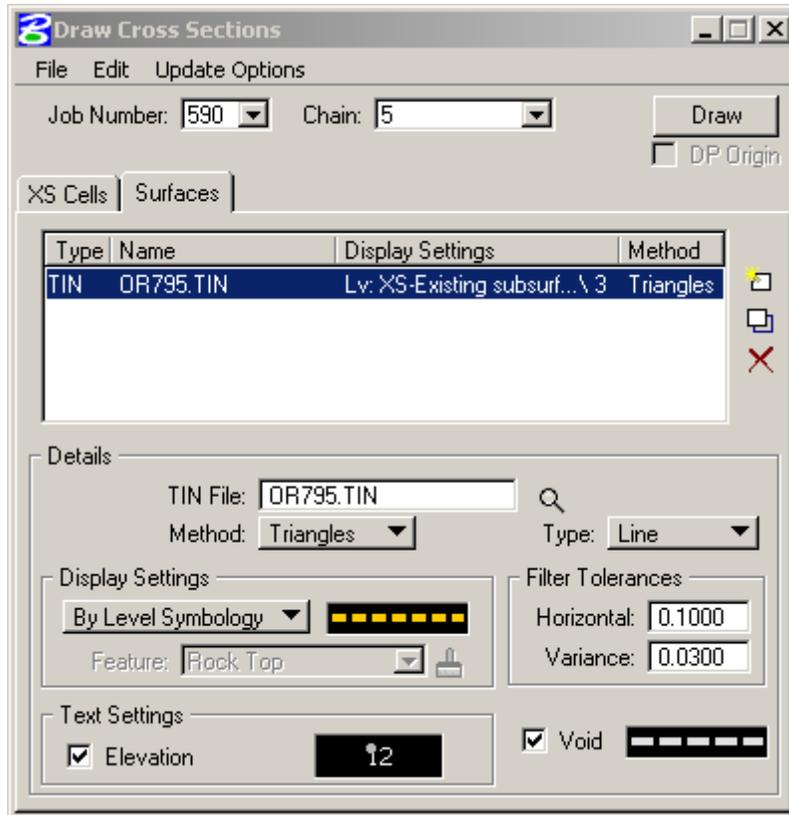
Vertical: 500.0000

Number of XS by Column: 40

Rock Excavation (End Area Method)

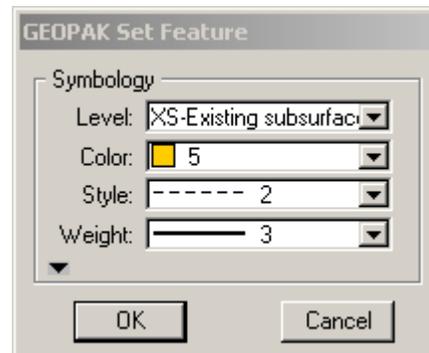
23) Select the Surfaces Tab and set up the dialog as below:

- a. Job Number
- b. Chain
- c. Tin File
- d. Surface Symbology – To change the surface Symbology Double Click in the Display Setting area and set the attributes the same as below right.



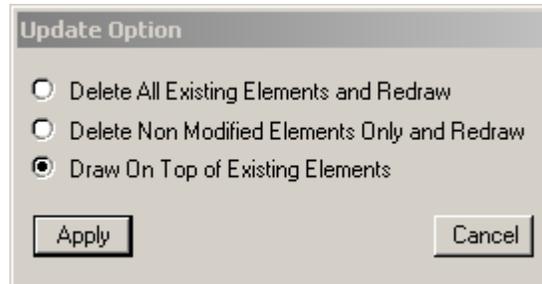
Rock Symbology → → →

Level = **XS-Existing subsurface-rock**

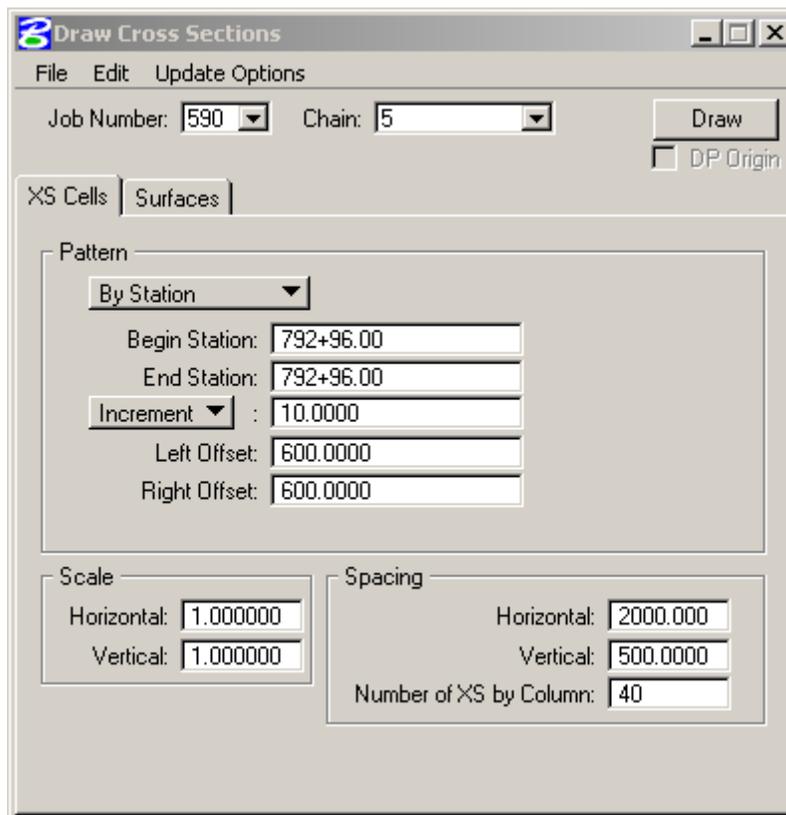


Rock Excavation (End Area Method)

- 24) Once all the items are set in the XS cells & Surfaces tab, save your settings and then hit the draw button. Select the “Draw on top of Existing Elements” option.

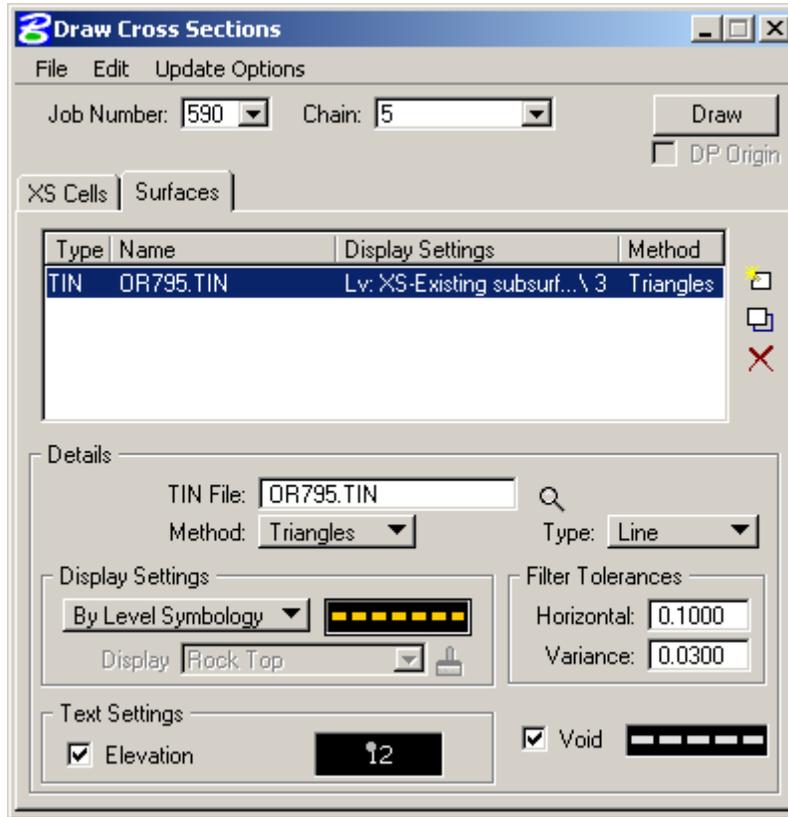


- 25) Create Zero Sections – Select the XS Cells tab in the Draw Cross Sections Dialog and change the Pattern method to “By Station”. Enter the station for the zero section. Make sure the beginning and ending station are the same. The left and right offset should be set to the same width as the other cross sections (600 ft. left and right).



Rock Excavation (End Area Method)

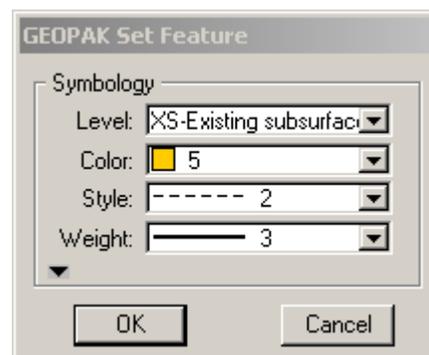
26) Under the Surfaces tab check and make sure the following items are set.



Surface symbology – To change the surface symbology Double Click in the area of the Display Setting and set the attributes as follows:

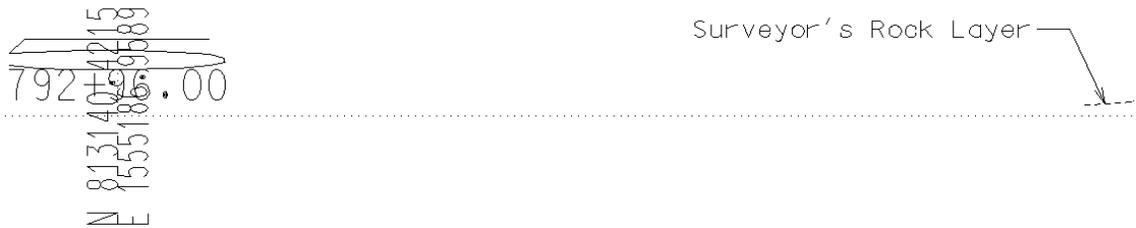
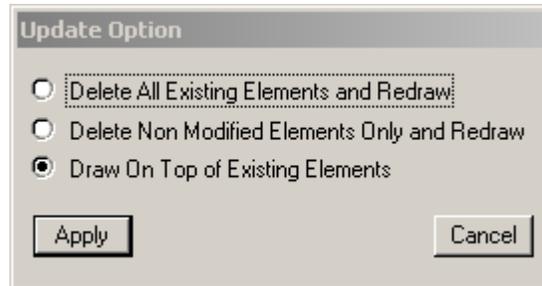
Rock Symbology → → →

Level = XS-Existing subsurface-rock



Rock Excavation (End Area Method)

27) Once all the items are set in the XS cells & Surfaces tab, save your settings and then hit the draw button. Select the “Draw on top of Existing Elements” option.

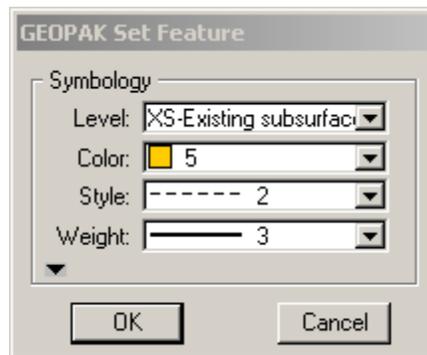


Rock Excavation (End Area Method)

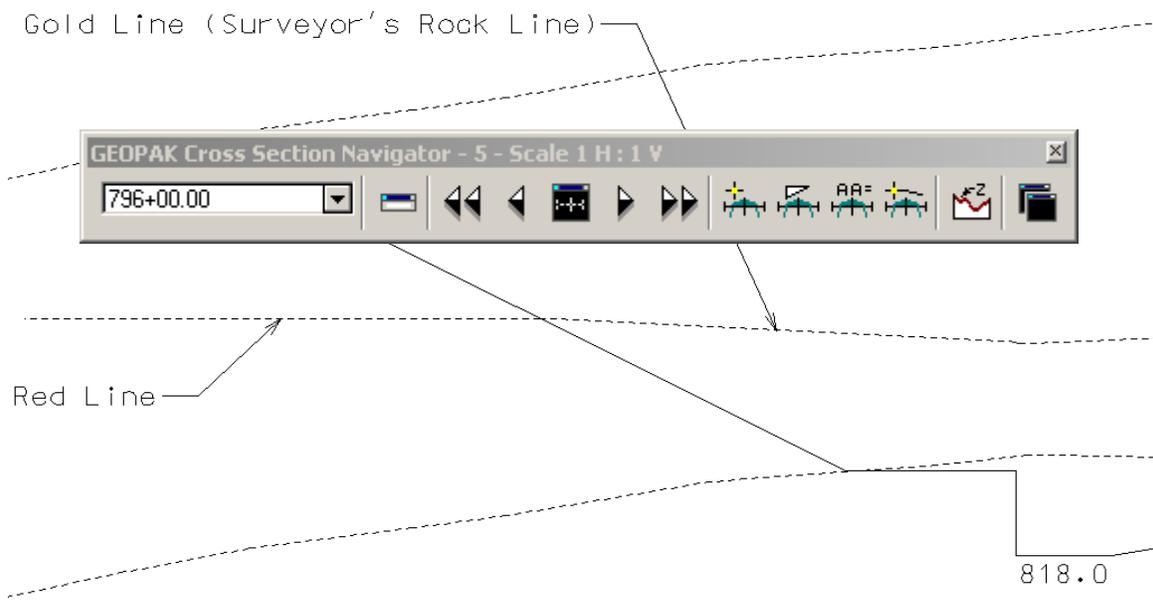
30) Match the Surveyors Rock Layer by using the smart match tool. → → →



31) Once you do a smart match, the active symbology should be set to the following:

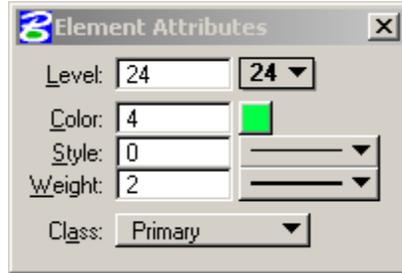


32) Next change the color from yellow (color 5) to Red (color 2). This will help us determine what the original rock line was vs. what we modified. Snap to the Gold line and extend your surface layer out past the slope-stake point.



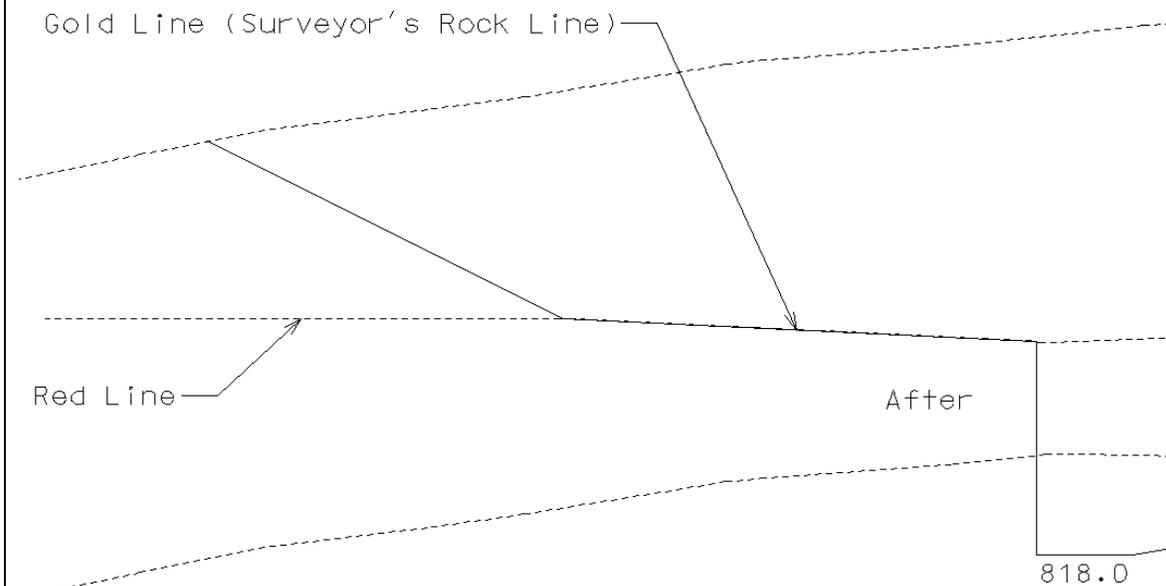
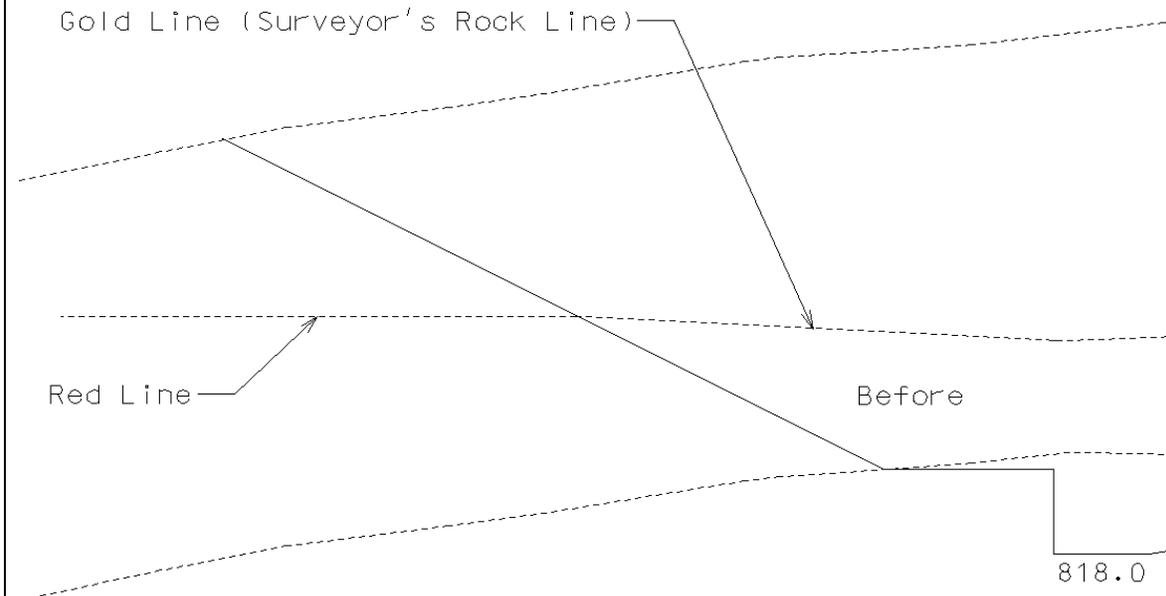
Rock Excavation (End Area Method)

33) Next adjust the XS past the Pre-Split Line. To do this you need to smart match the proposed ground line. Once you do a smart match you active symbology should be the following.



Rock Excavation (End Area Method)

- 34) Using various MicroStation Tools adjust the proposed finish grade (template) line past the pre-split line (back of ditch).

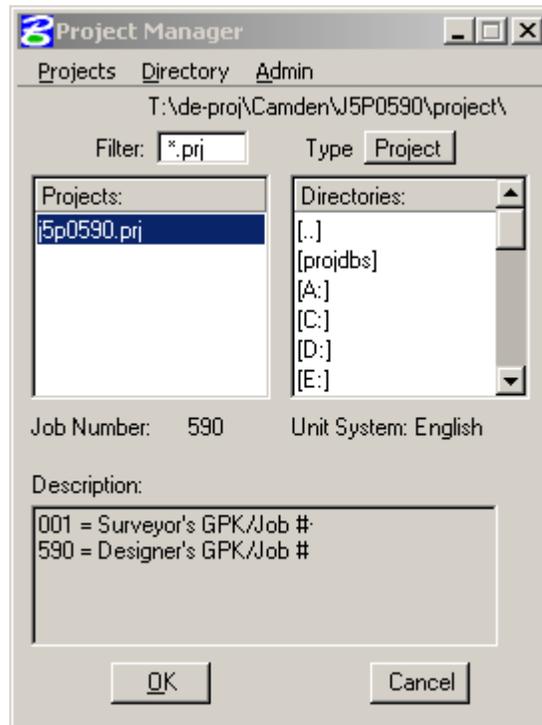


Rock Excavation (End Area Method)

35) Once you have every cross section that needs adjustment done, and the dgn file saved, you can then run earthwork.

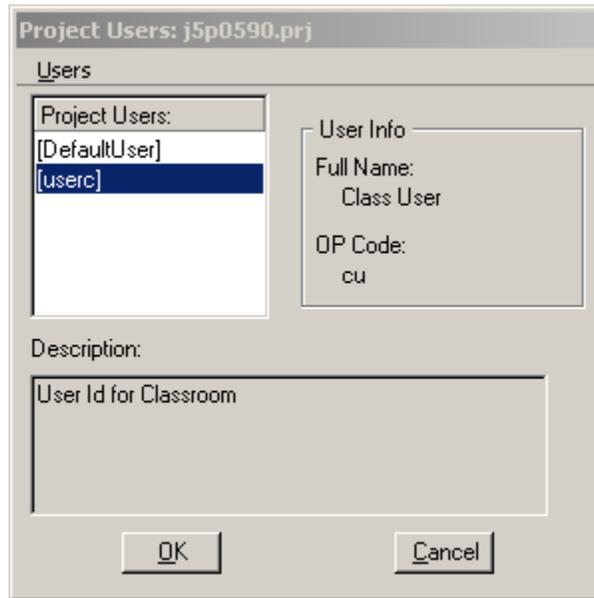
36) Close down GeoPak Survey by selecting **Project > Exit**

37) Open up GeoPak Road by selecting **Applications > GeoPak Road >Project Manager**



Rock Excavation (End Area Method)

38) Select **classc** as the Project User



Project Users: j5p0590.prj

Users

Project Users:

- [DefaultUser]
- [userc]

User Info

Full Name: Class User

OP Code: cu

Description:

User Id for Classroom

OK Cancel

39) From the Road Dialog select “**Earthwork**”, do a run copy run, and copy the MoDOT run. Call the new run **OR795**.



New Run Name

Run Name: OR795

Description: Earthwork run for Rock

OK Cancel

Rock Excavation (End Area Method)

- 40) Once in the earthwork run adjust the Beginning and Ending Stationing to reflect the Zero Stations.

Earthwork - OR795

Files

XS DGN File: XS_RTE_5.dgn [Select]

Tolerance: 0.010000

Vertical Search Distance: 500.00

Baseline: 5

Begin Station: 792+96

End Station: 800+00

Files list: XS DGN File, Soil Types, EW Shapes, Output Format, Add/Sub Vol, Centroid Adj, Skip Areas, Sheet Quant.

- 41) Under the “Soil Types” define the soil information (see next page).

Earthwork - OR795

Files

Soil Type Items

Existing Ground

Existing Suitable

Proposed Finish Grade

Criteria Status

Lv: 18,20,24,33-34,46

Wt:

Lc:

Tp:

Co: 0,4,35-36,60-63,7

Class: Proposed Finish Grade

Soil Type: ClassA

Multiplication Factors

Roadway Excavation: 1.0001

Subsoil Excavation: 1.0001

Fill: 1.000000

Search Criteria

Use Working Alignment Definition

Levels [Select] Styles [Select]

Weight [Select] Types [Select]

Colors: 0,4,35-36,60-63,71

[Match] [Display] [Reset]

[Add] [Delete] [Modify]

Rock Excavation (End Area Method)

Existing Ground Line

```
soil type = ClassC
roadway exc mult factor = 1.000000
subsoil exc mult factor = 1.000000
fill mult factor = 1.000000
  type = line, line_string
  lvname = Level 57
  co = 0-1,6,34,38,64,66,70,90,97-98,102,128
```

Proposed Finish Grade

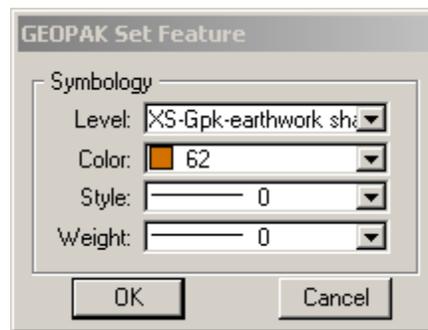
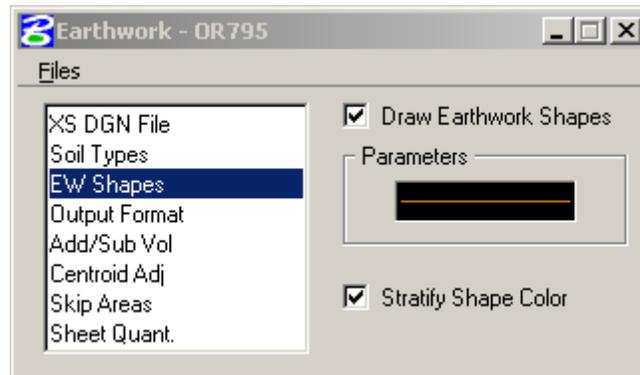
```
soil type = ClassA
roadway exc mult factor = 1.000000
subsoil exc mult factor = 1.000000
fill mult factor = 1.000000
  type = line, line_string
  lvname = Level 24
  lvname = Level 18
  lvname = Level 20
  lvname = Level 33
  lvname = Level 34
  lvname = Level 46
  co = 0,4,35-36,60-63,71
```

Existing Suitable Material

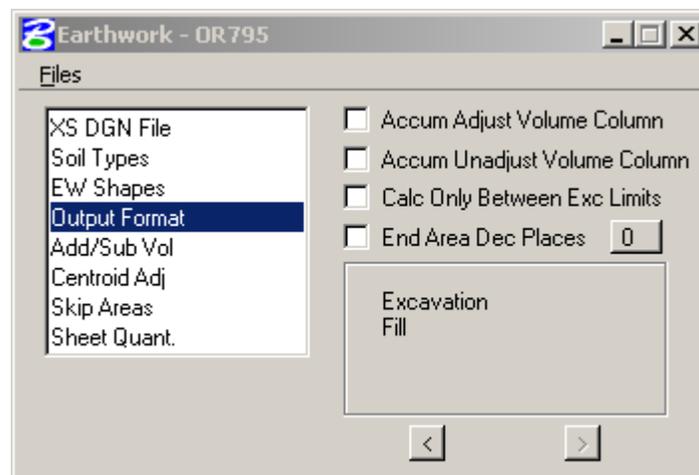
```
soil type = ClassA
roadway exc mult factor = 1.000000
subsoil exc mult factor = 1.000000
fill mult factor = 1.000000
  type = line, line_string
  lvname = XS-Existing subsurface-rock
  co = 2,5
```

Rock Excavation (End Area Method)

- 42) Under the “EW Shapes” section toggle on **Draw Earthwork Shapes** and **Stratify Shape Color**.

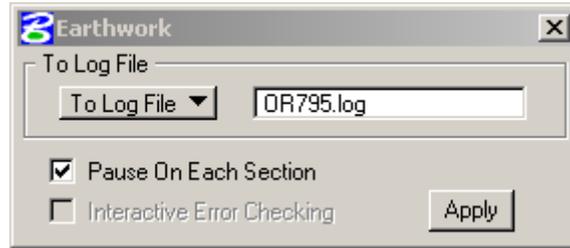


- 43) Output Format



Rock Excavation (End Area Method)

44) To process the earthwork run go to the files pull down and select “run”



Change the Earthwork Log File Dialog setting from Screen Only to Log File and type in **OR795.log** for the Log file name.

G R A N D Material Name	S U M M A R Y Unadjusted Volumes (cu. yd.)	T O T A L S Adjusted Volumes (cu. yd.)	Mult Factor

CLASSA	Excavation	103778	1.00
	Fill	61915	1.00
CLASSC	Excavation	53198	1.00
	Fill	0	1.00