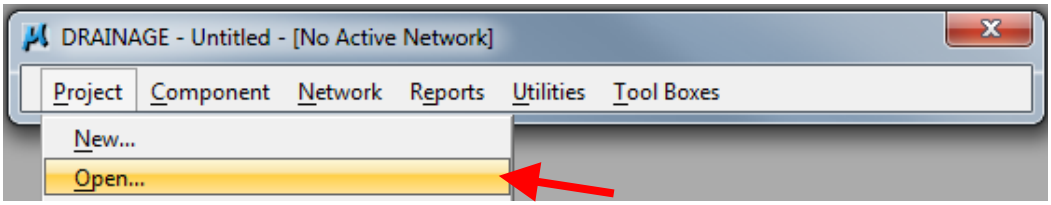
Geopak Drainage – Areas

This section provides instructions on how to add areas and compute their discharge in Geopak Drainage.

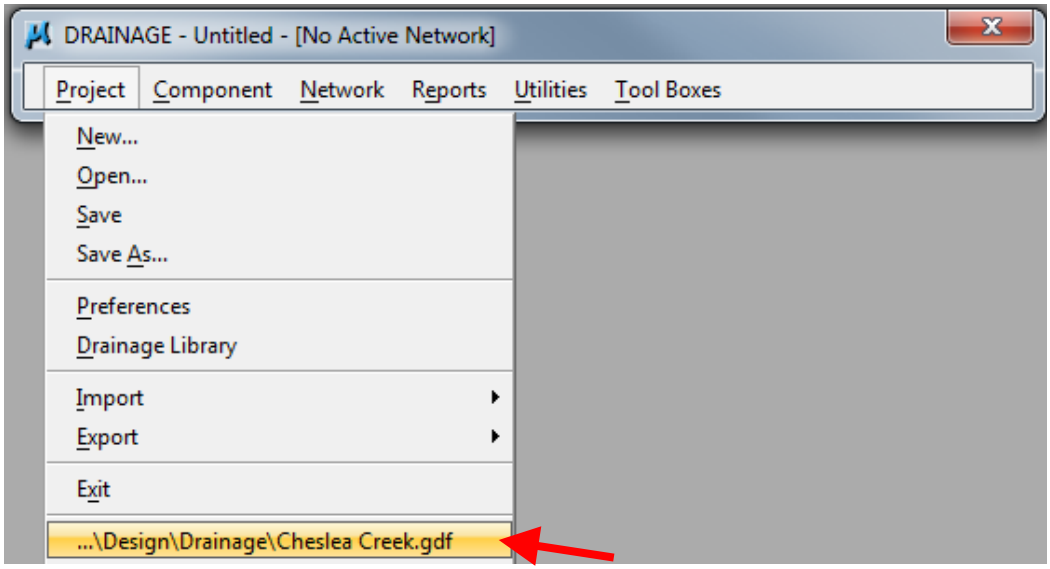
Opening a Project

For instructions on starting a new Geopak Drainage project, see Section 4A-52. To open an existing project, start Geopak Drainage as shown in Section 4A-52. In the DRAINAGE dialog box, go to *Project→Open* and browse to the appropriate file:



OR

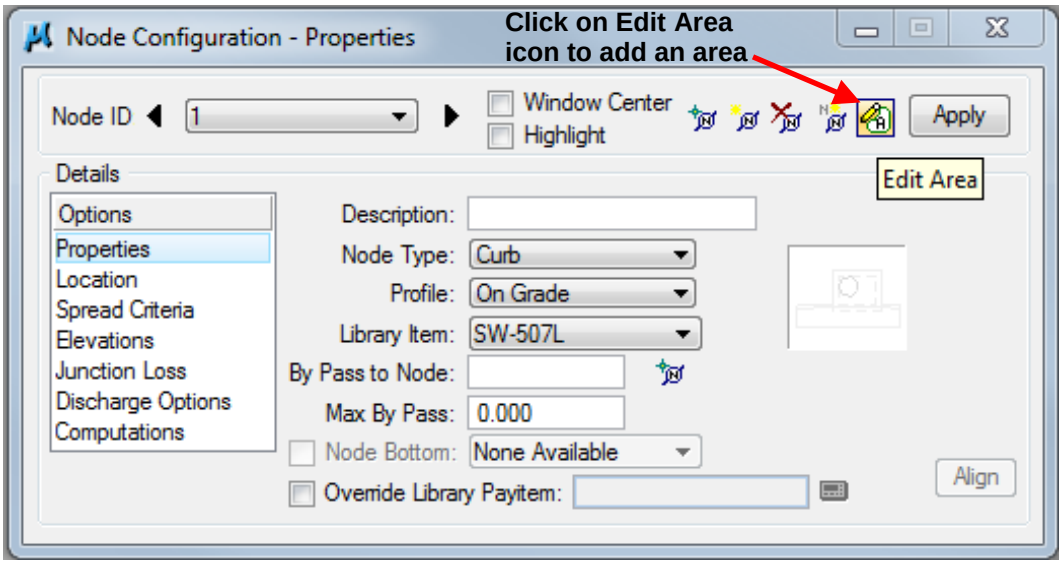
Choose a project at the bottom of the Project menu in the DRAINAGE dialog box:



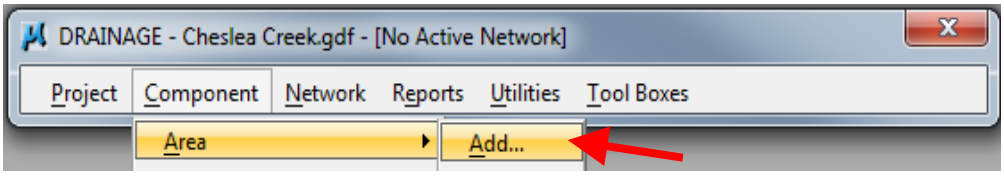
Adding Areas

Areas can be added in several ways:

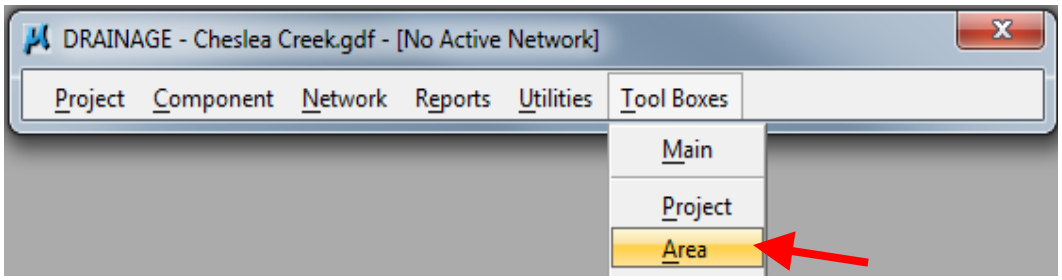
- Using the Node Configuration dialog box (see Section 4A-53). This is the preferred method, as it guarantees the area will be associated with the correct node.



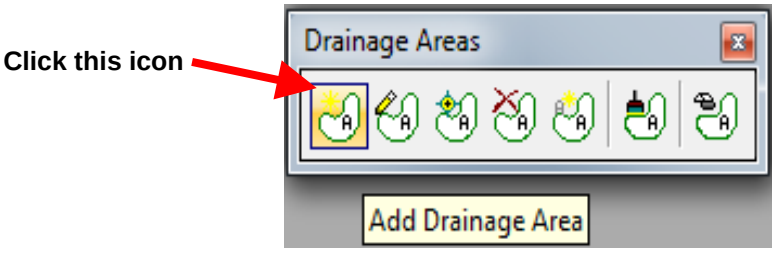
- Using the Component menu in the DRAINAGE dialog box:



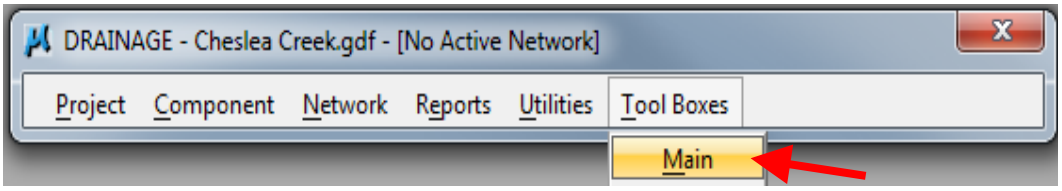
- Using the Drainage Areas toolbox accessed through the DRAINAGE dialog box:



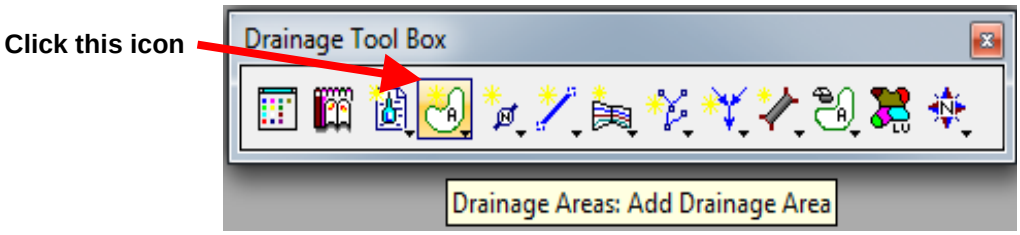
The following tool box will appear:



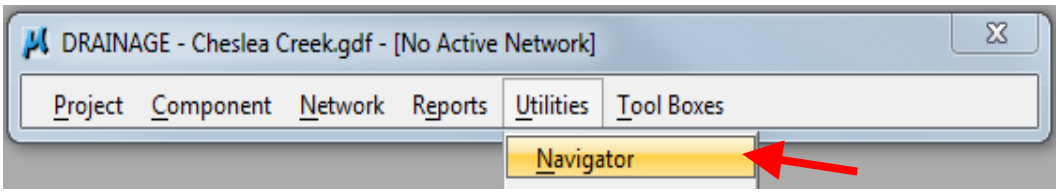
- Using the Drainage Tool box accessed through the DRAINAGE dialog box:



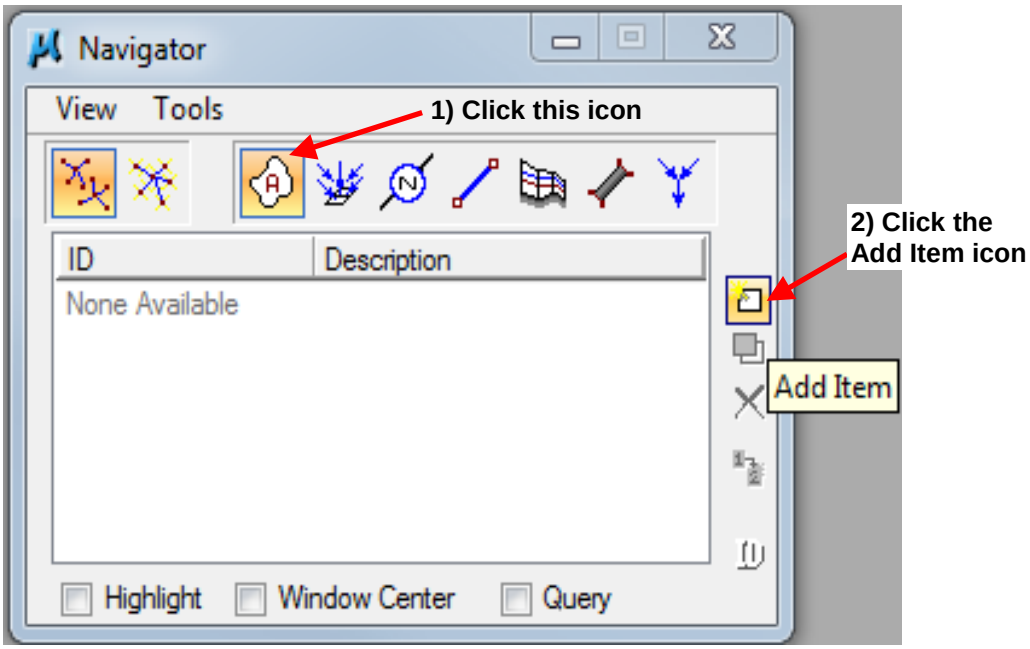
The following tool box will appear:



- Using the Navigator accessed through the DRAINAGE dialog box:

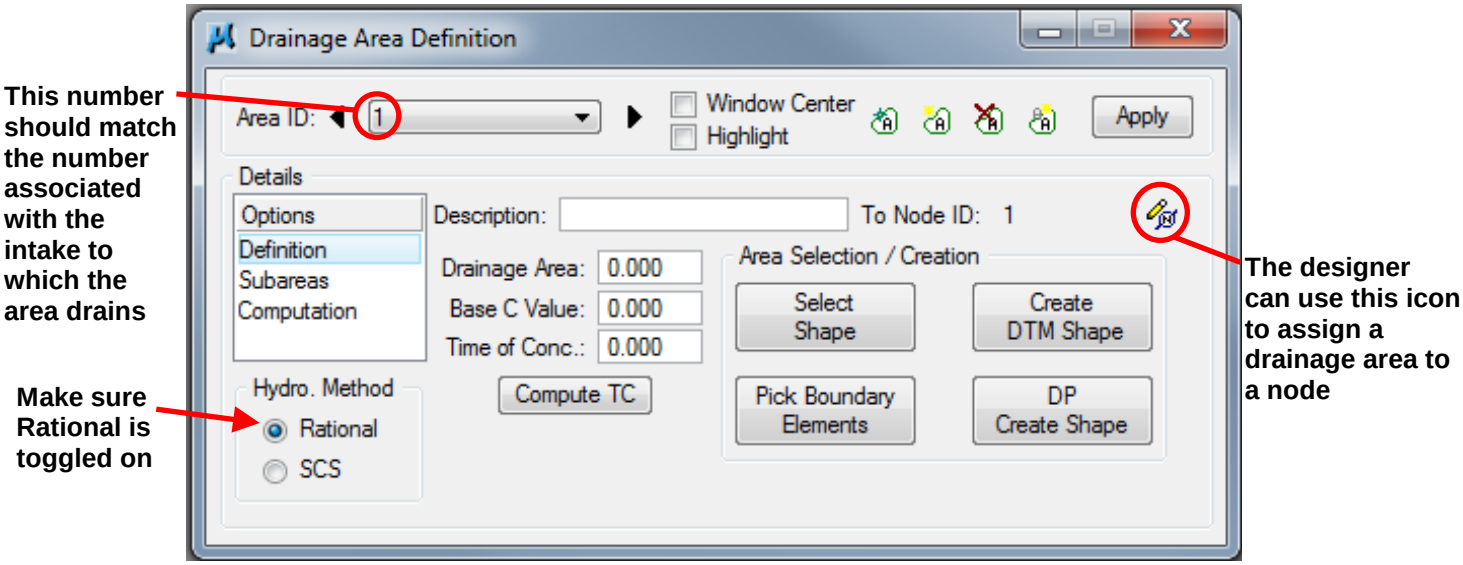


The following dialog box will appear:



Regardless of the method designers use add an area, the following dialog box will appear:

Click OK and the following dialog box will appear:



Designers have several options for inputting drainage area data.

Key-in Data

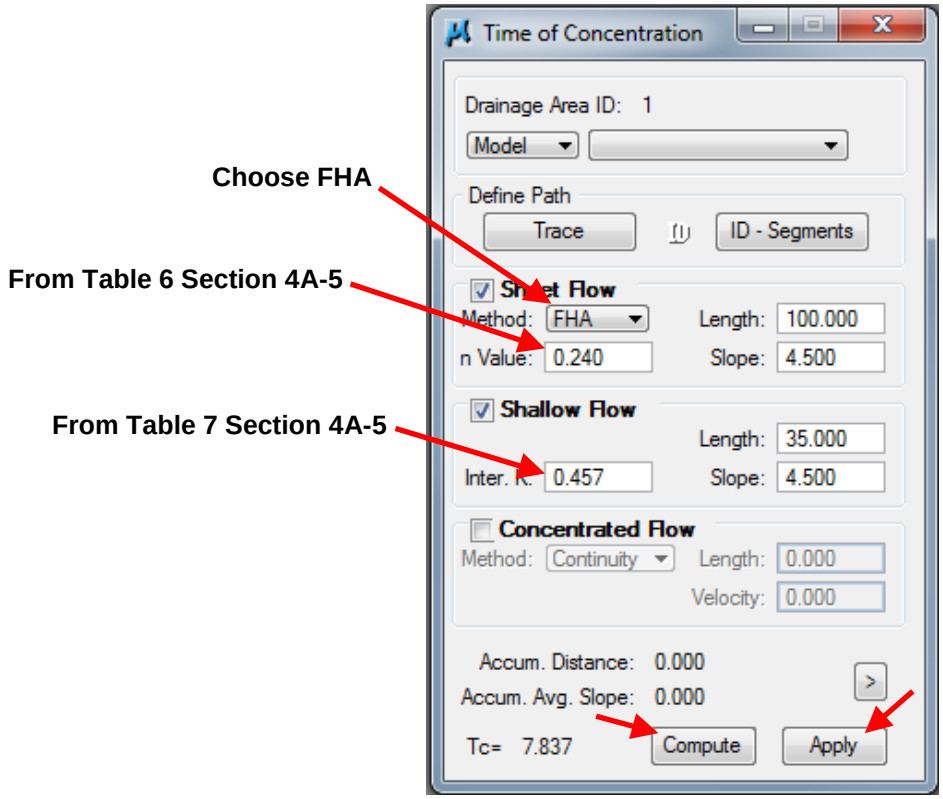
Under Options→Definition

Drainage Area: Enter the area (in acres) for the entire drainage area draining into the intake.

Base C Value: Enter the base C value for the drainage area. This is the value that will be used for subareas that do not have a defined C value.

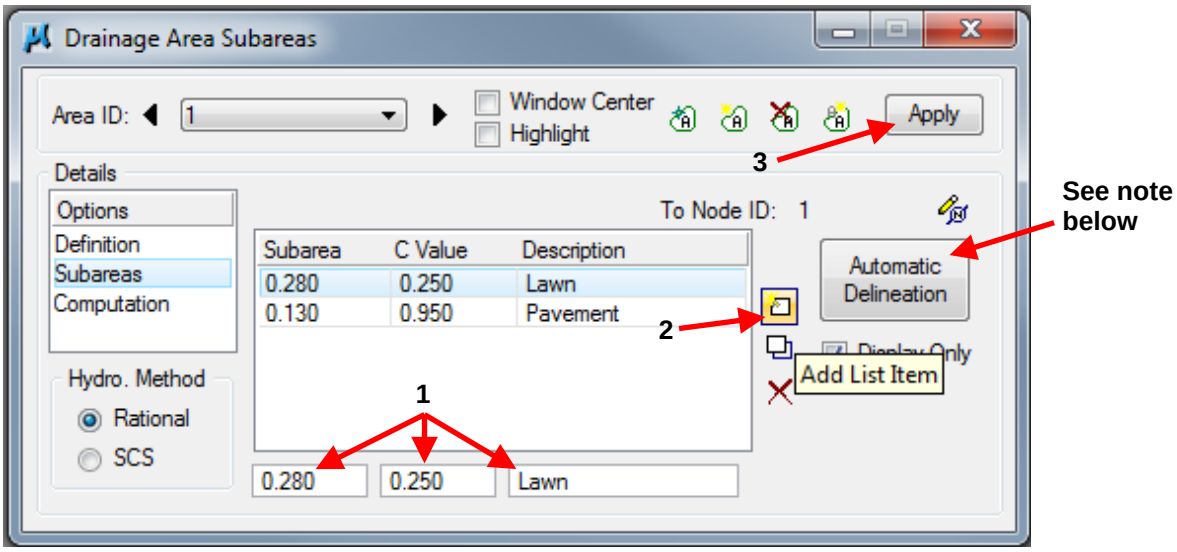
Time of Concentration: Designers have two options:

- *Enter a value* – This option allows the designer to key-in a value.
- Click on *Compute TC* – This option will open the dialog box below. Fill in the appropriate information, click *Compute*, and then click *Apply*.



Under *Options→Subareas*

1. Fill in the information for each of the subareas (Description is optional).
2. Click on the Add List Item icon.
3. Click Apply.



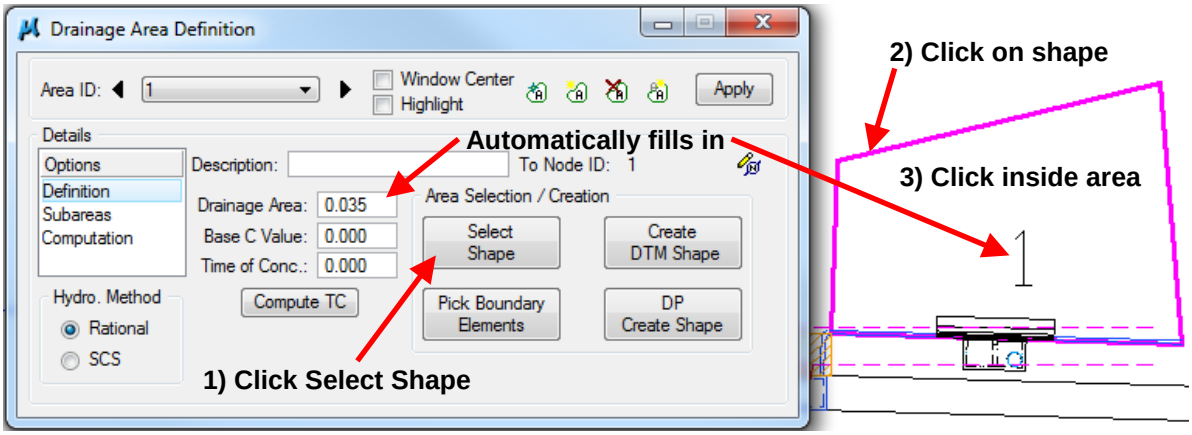
Note: To use the *Automatic Delineation* function, line symbology is required to define land use and associated runoff coefficients. The Office of Design has not yet developed this symbology.

To modify a subarea, click on the row, change the information for the subarea, click on the Modify List Item icon, and click Apply.

Select Shape

This option allows designers to select a previously drawn MicroStation shape. Click on *Select Shape*, click on the MicroStation shape (it will highlight), and click inside the MicroStation shape. *Drainage*

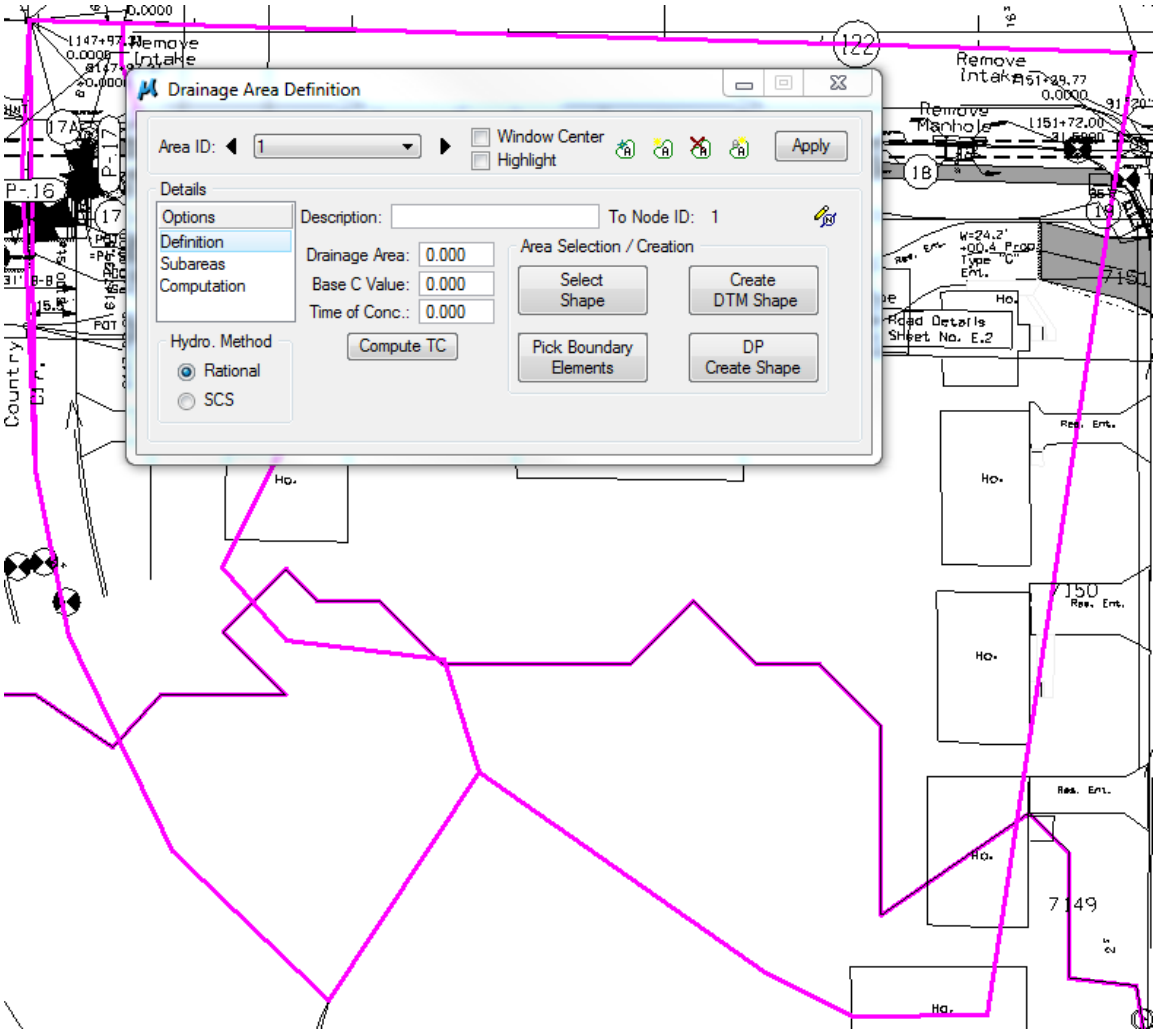
Area will fill in automatically and the number of the drainage area will appear inside the drainage area.



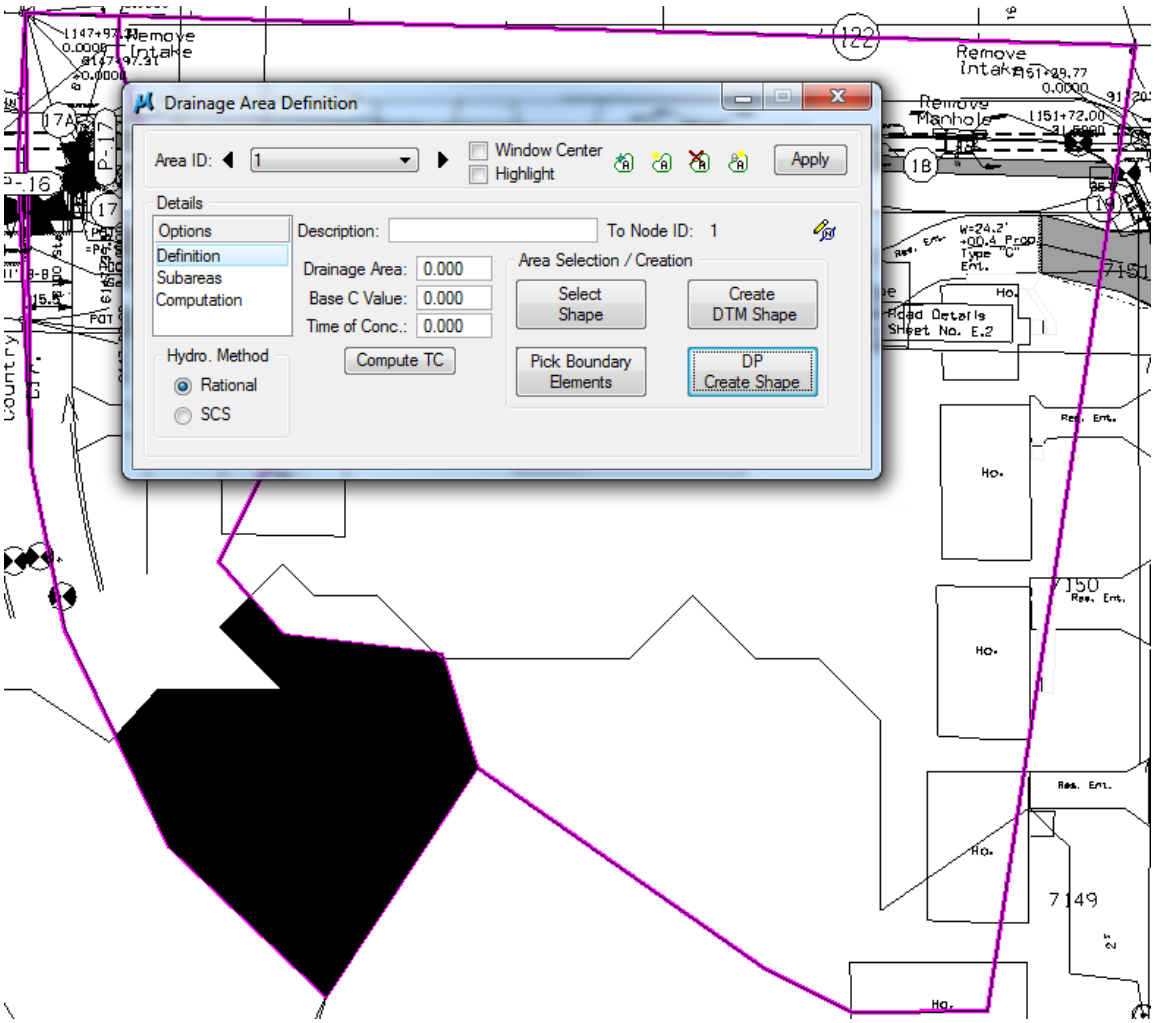
Pick Boundary Elements

This option allows designers to pick elements that serve as a boundry for a drainage area. The elements must bound an enclosed area.

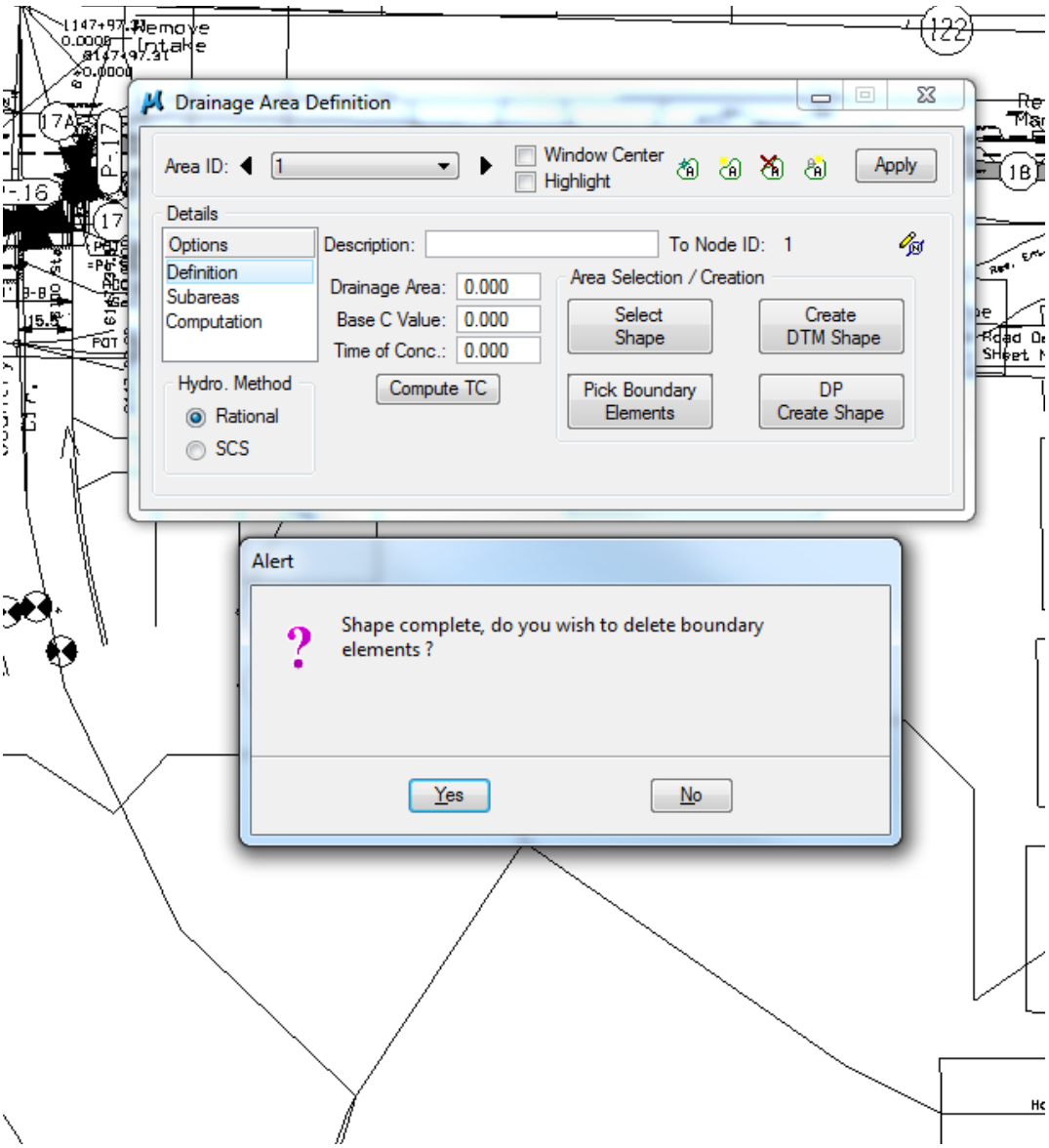
1. Click on *Pick Boundry Elements*. Click on the shapes that bound the drainage area.



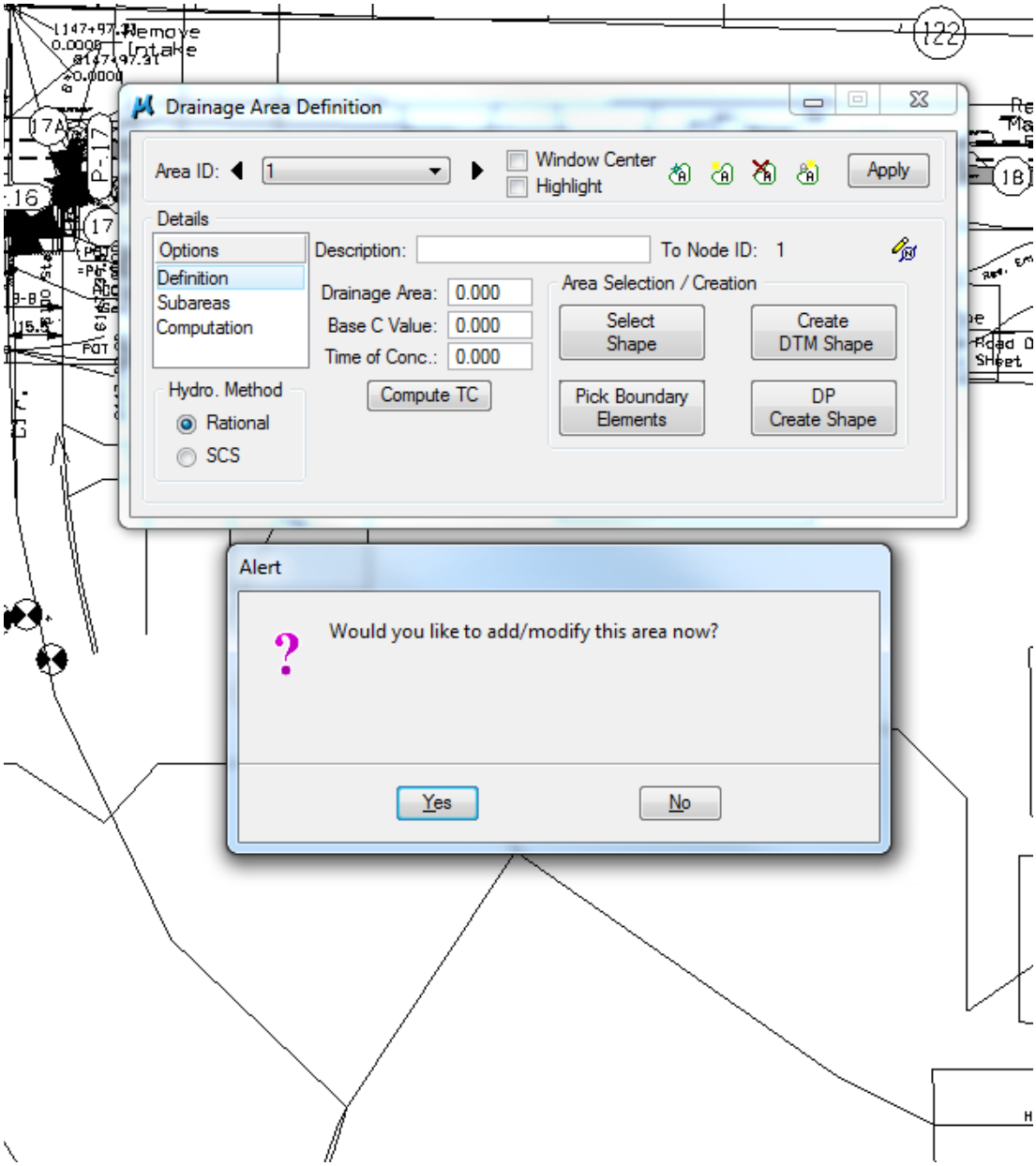
2. Click on *DP Create Shape* (the last element selected will no longer be highlighted) and click inside the drainage area. The area will be highlighted.



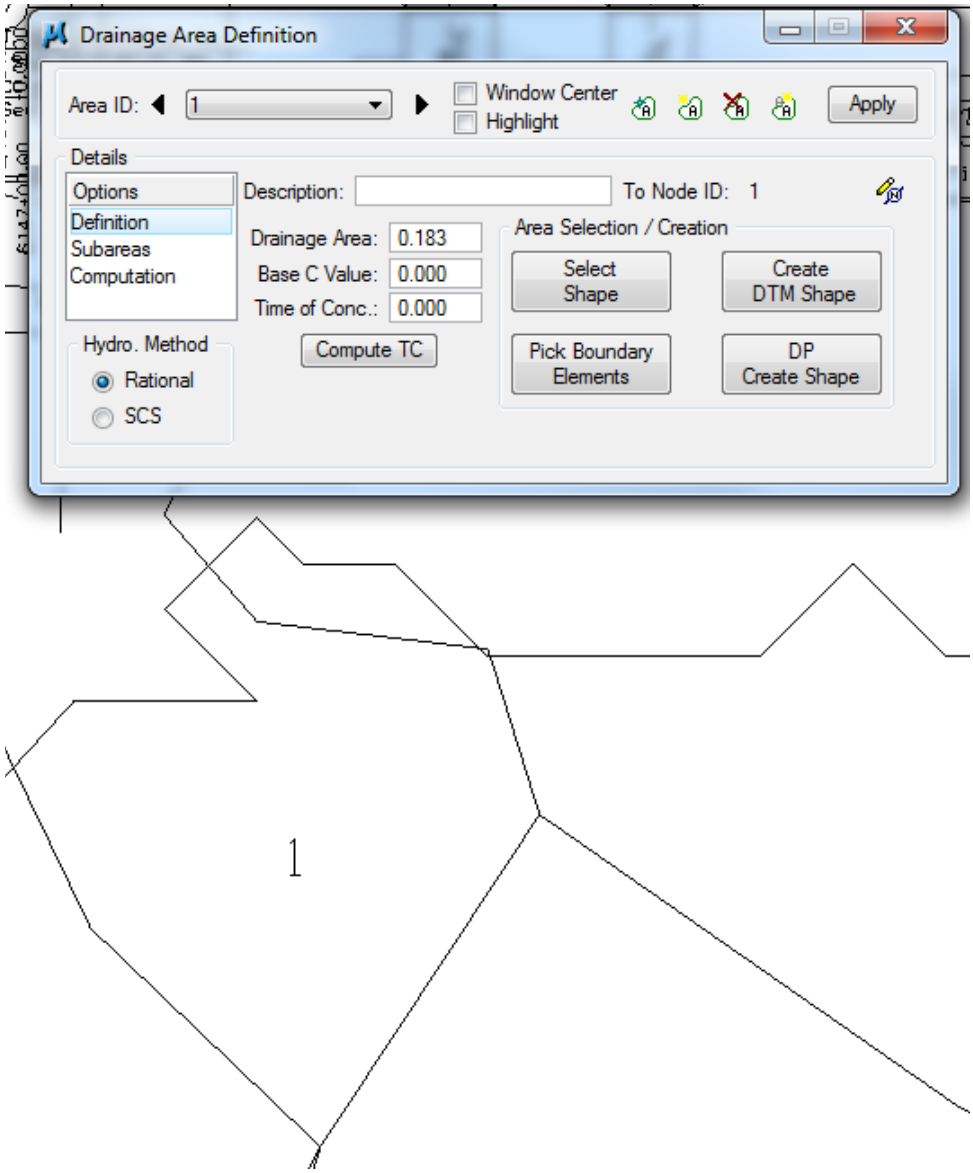
3. Click a second time. The highlighting will disappear and you will be asked if you want to delete the boundry elements. Click No if you want to keep the elements.



You will be asked if you want to add/modify the area.



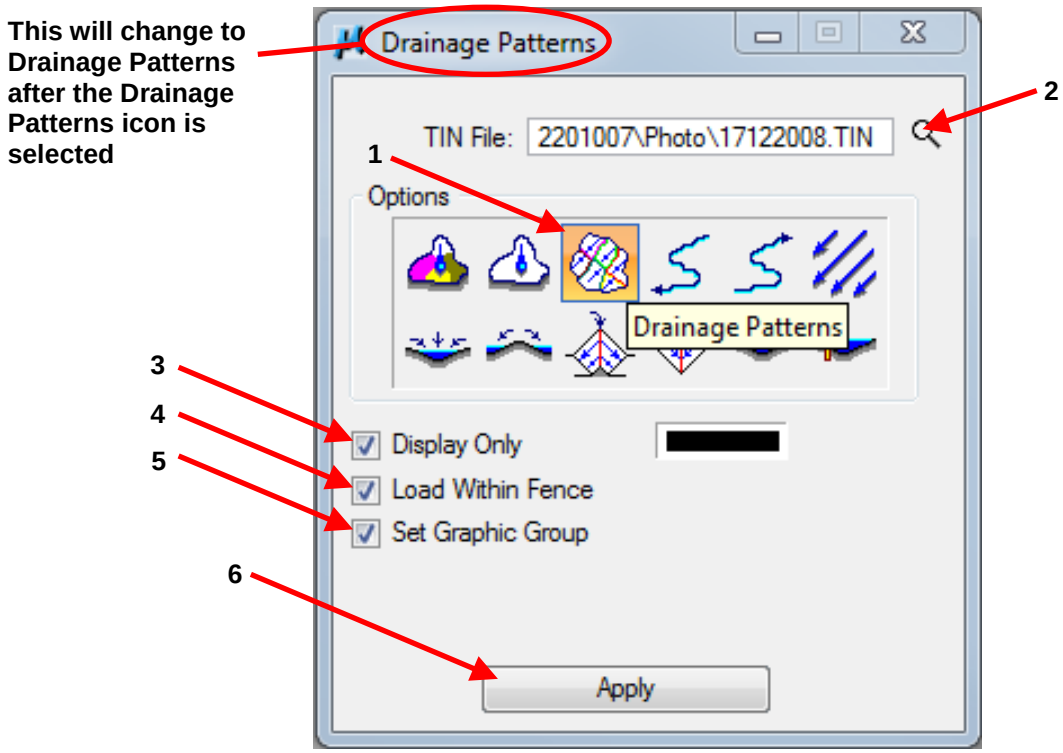
4. Click yes and *Drainage Area* will fill in automatically and the number of the area will appear in the drainage area.



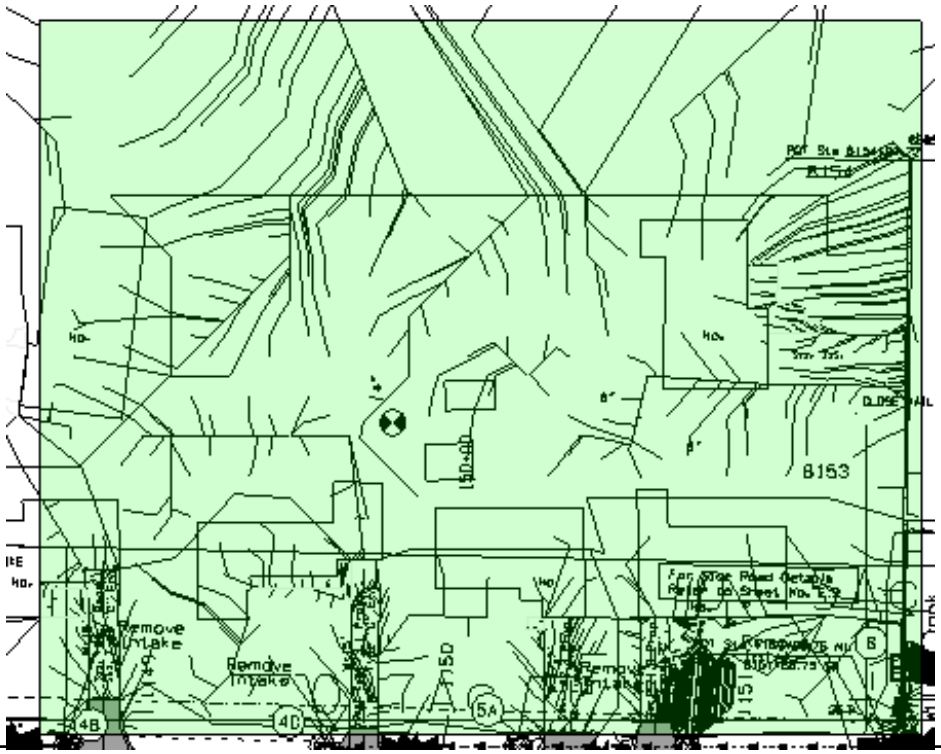
Create DTM Shape

This tool can be used to delineate a watershed at any location within the TIN or within a bounded area. Since intake locations determine drainage areas, this tool has limited use for highway drainage; however, it can be used to draw drainage patterns. Designers can also use the DTM toolbox accessed through *Applications→GEOPAK→ROAD→DTM Tools* to examine contour lines. These tools can help the designer to delineate a drainage area associated with an intake.

To draw drainage patterns, click on *Create DTM Shape* and the following dialog box will appear:



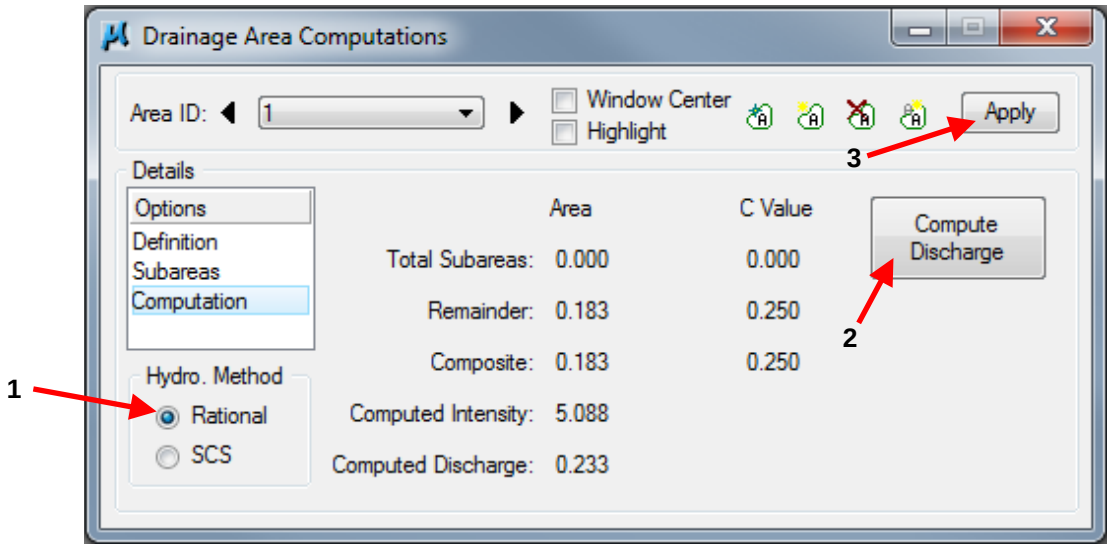
1. Click on the *Drainage Patterns* icon.
2. Select the appropriate *TIN File*.
3. Check *Display Only* and select the symbology of the patterns to be created.
4. Check *Load Within Fence* to compute the drainage patterns within a MicroStation fenced area.
5. Check *Set Graphic Group* to create drainage pattern lines in a MicroStation graphic group.
6. Click *Apply* to draw drainage patterns.



Calculating Discharge

Under *Options*→Computation

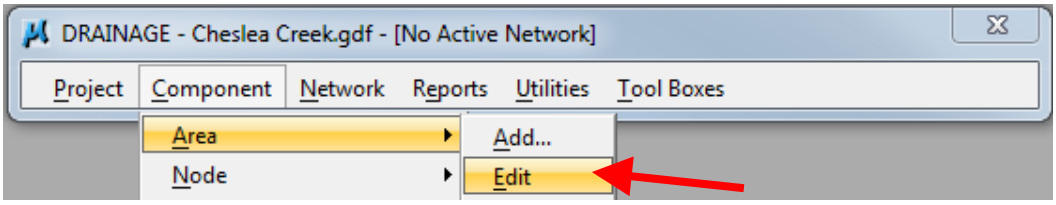
1. Set to *Rational*
2. Click *Compute Discharge*
3. Click *Apply*



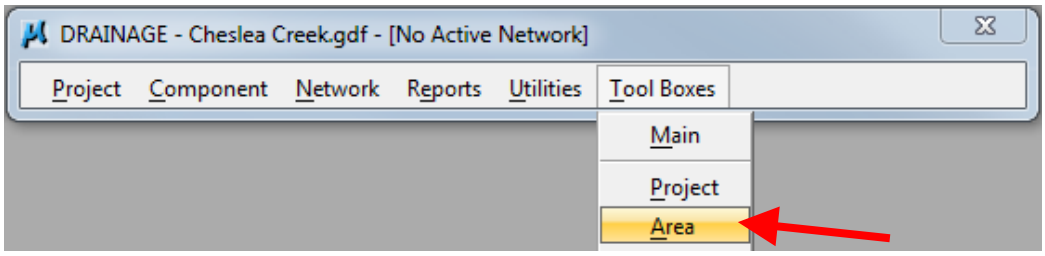
Editing Areas

Areas can be edited at any time. Designers have several options to open an area for editing:

- Using the Component menu in the DRAINAGE dialog box:

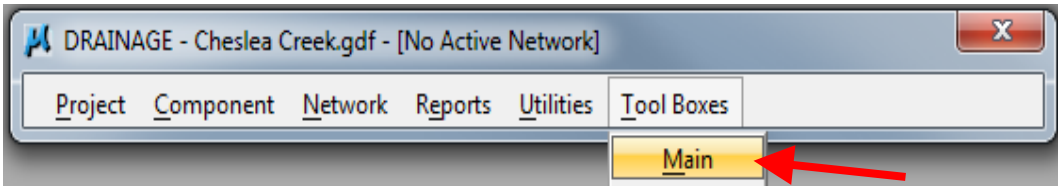


- Using the Drainage Areas toolbox accessed through the DRAINAGE dialog box:



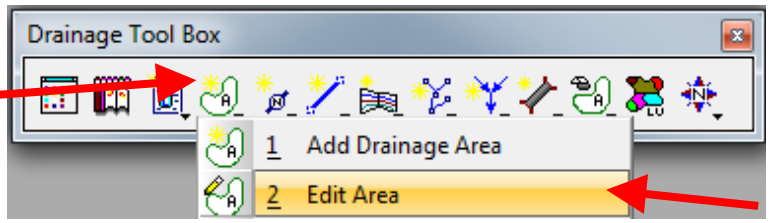
The following tool box will appear:

- Using the Drainage Tool Box accessed through the DRAINAGE dialog box:

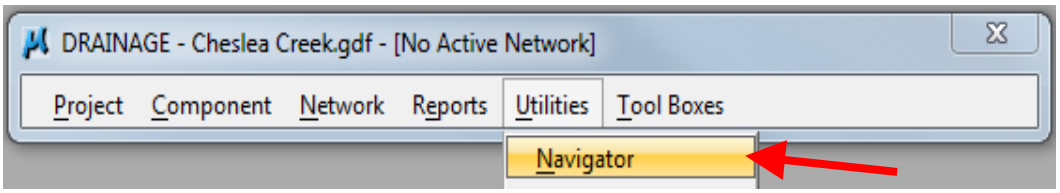


The following tool box will appear:

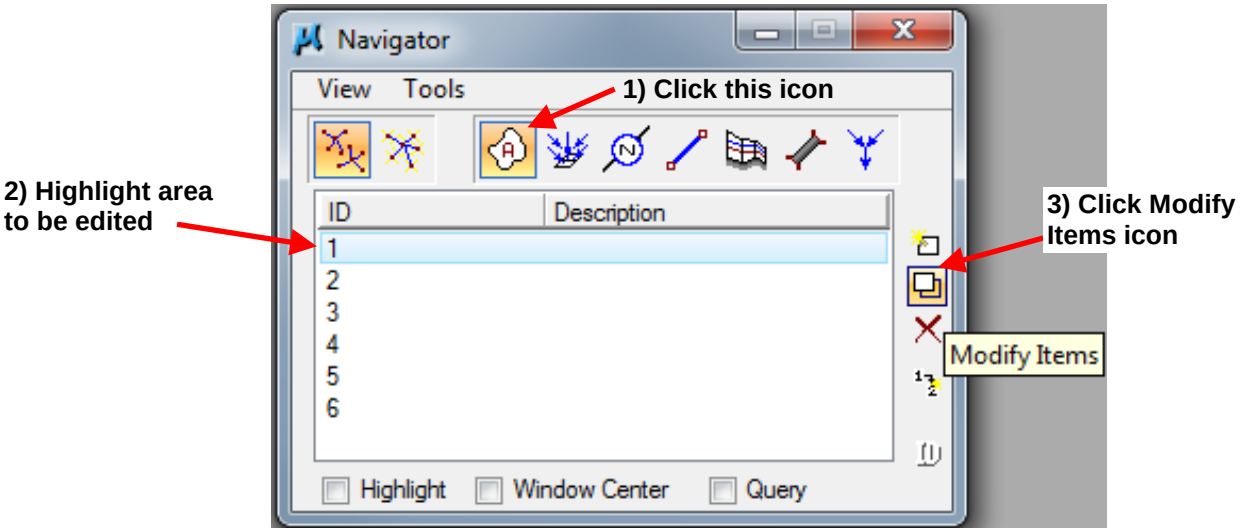
Click on this icon and hold mouse button down until drop down menu appears



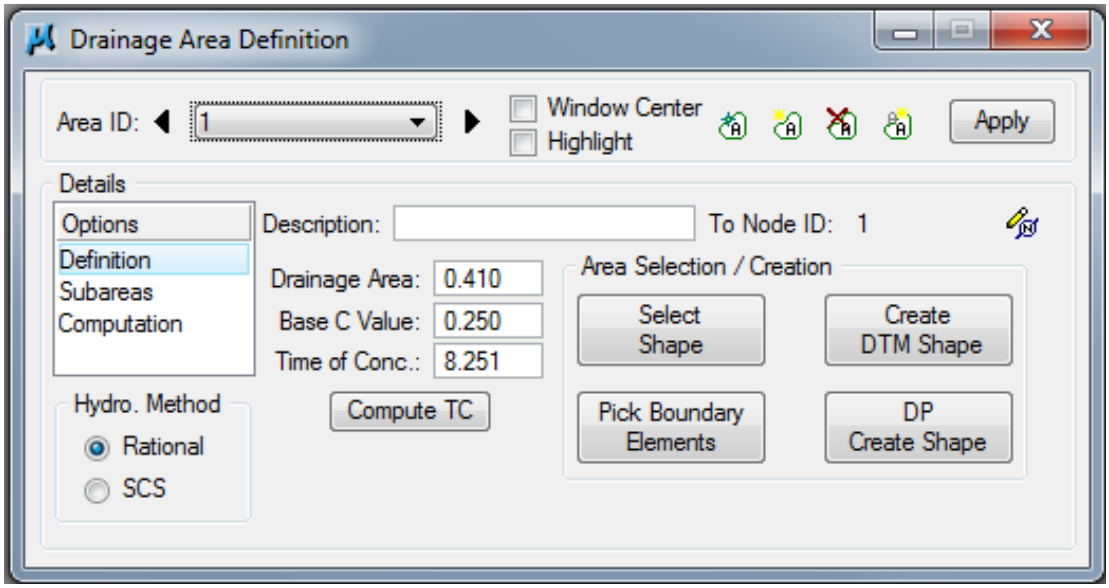
- Using the Navigator accessed through the DRAINAGE dialog box:



The following dialog box will appear:



Regardless of the method designers use edit a node, the Drainage Area Definition dialog box will appear:



Changes are made in this dialog box.

Note: In order to have changes take place, the *Apply* button must be clicked.

Chronology of Changes to Design Manual Section:

004A-054 GEOPAK Drainage Area

9/13/2012	Revised Corrected reference on page 5. Reference should be to Table 6 in Section 4A-5 instead of 4A-6.
7/29/2011	NEW New