

Geopak Drainage – Networks

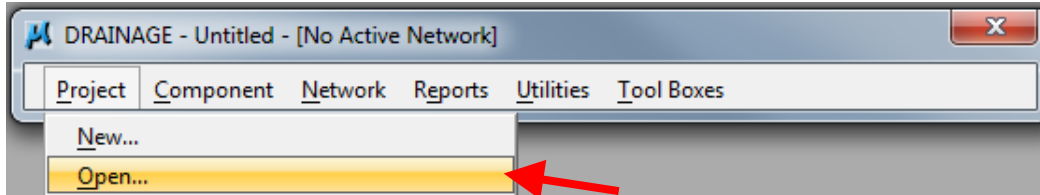
Design Manual
Chapter 4
Drainage

Originally Issued: 07-29-11
Revised 09-30-11

This section provides instructions on how to add networks in Geopak Drainage. A network is a series of interconnected nodes and links that drain to a single outlet.

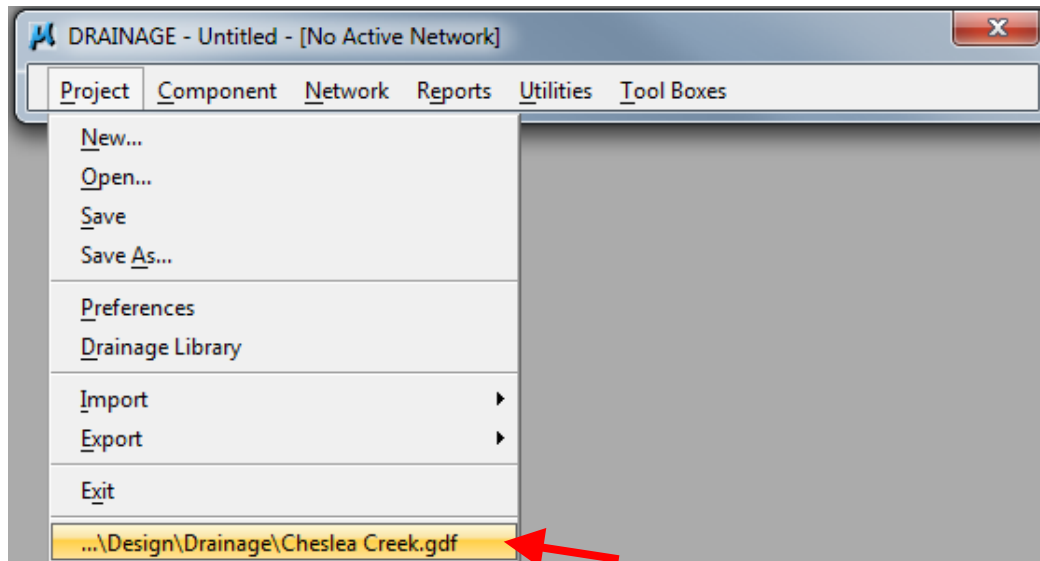
Opening a Project

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

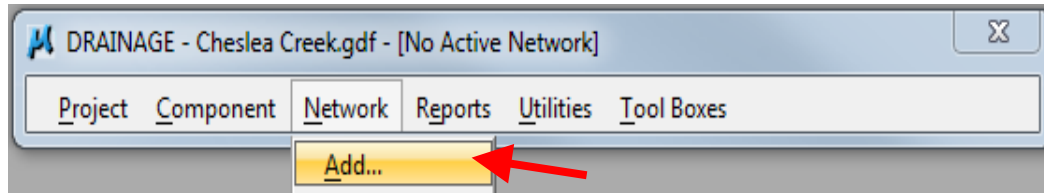
Choose a project at the bottom of the *Project* menu in the DRAINAGE dialog box:



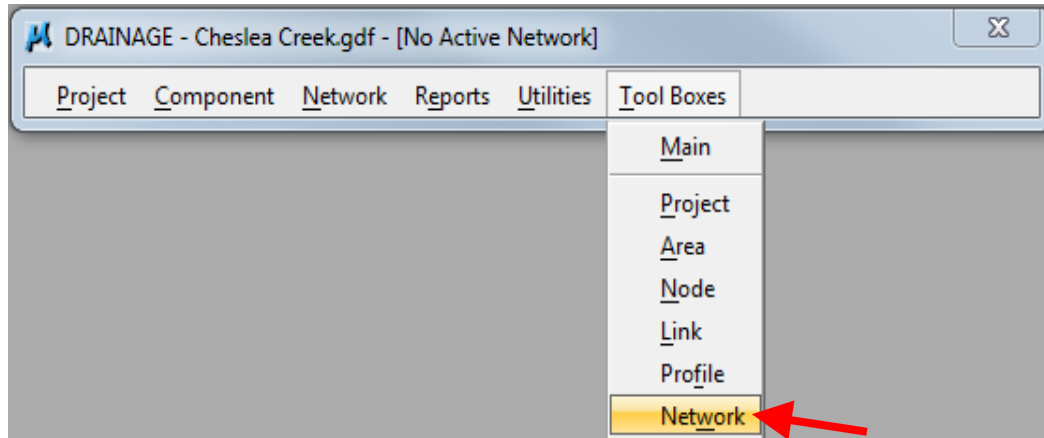
Adding Networks

Networks can be added in several ways:

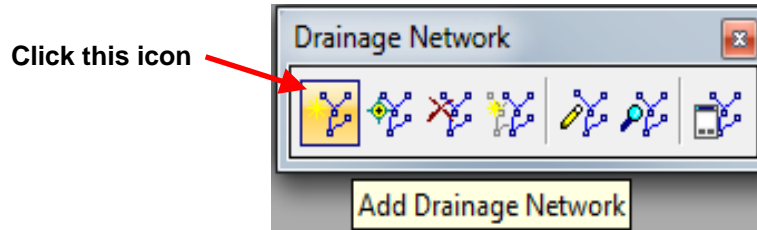
- Using the Network menu in the DRAINAGE dialog box:



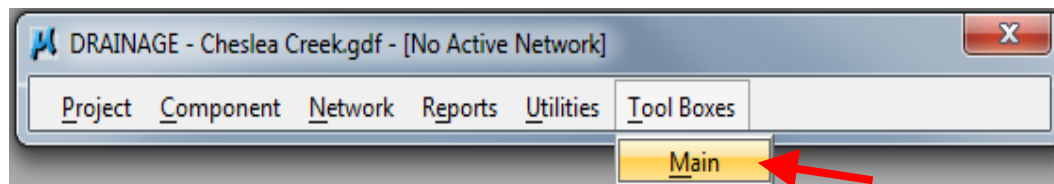
- Using the Drainage Network toolbox accessed through the DRAINAGE dialog box:



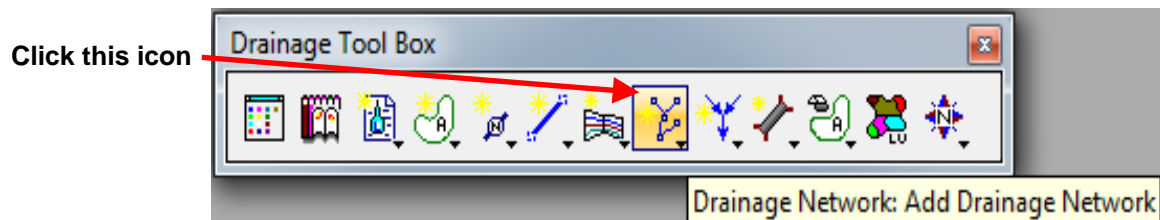
The following tool box will appear:



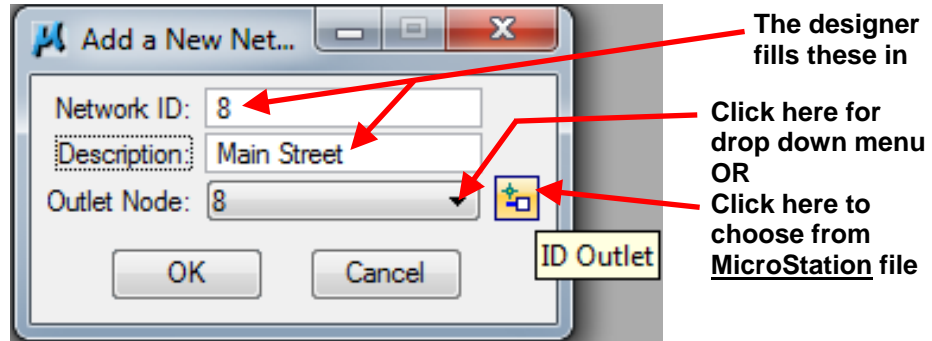
- Using the Drainage Tool box accessed through the DRAINAGE dialog box:



The following tool box will appear:



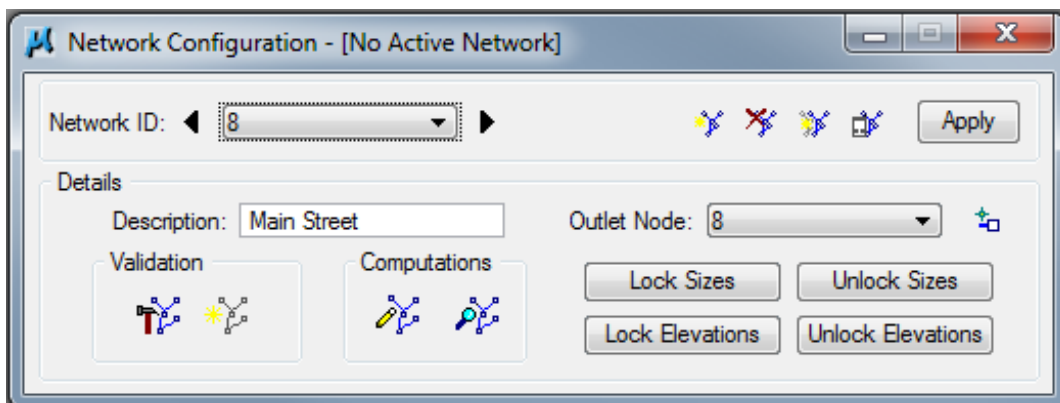
Regardless of the method designers use to add a network, the following dialog box will appear:



- *Network ID*: Give the same name and/or number as the Outlet Node.
- *Description*: The designer can add a description if desired.
- *Outlet Node*: Use the drop down menu to select the correct node or use ID Outlet icon to select an outlet from the MicroStation file.

For the outlet node to appear in the drop down menu, the Node Type must be classified as an Outlet, see Section [4A-53](#). If an outlet node does not appear in the drop down menu, then one needs to be created.

Click OK and the following dialog box will appear:



The designer can now build and design or analyze a network.

Validation

Two options exist under Validation: Build Network and Highlight Network.



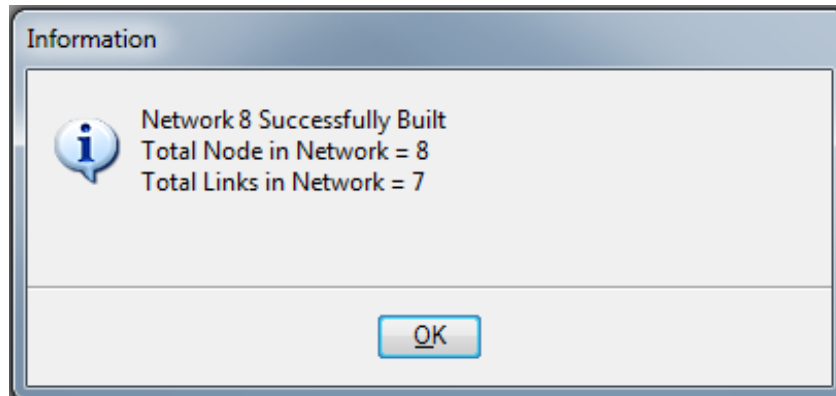
Build Network

Clicking the Build Network icon in the Network Configuration dialog box will create and save a network and all associated nodes and links. Clicking on this icon isn't necessary, as Geopak Drainage can build the network when it performs calculations. However, building a network prior to performing calculations allows the designer to locate potential problems before performing calculations.

Highlight Network

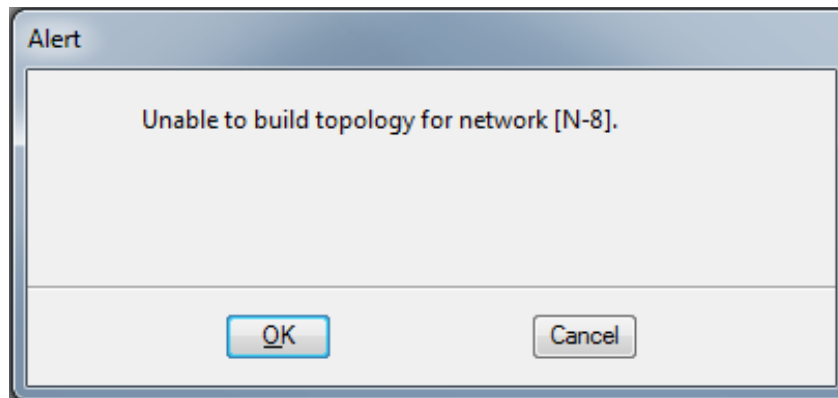
Clicking the Highlight Network icon in the Network Configuration dialog box will highlight all elements of the network in the MicroStation window. This step is optional.

If Geopak Drainage is able to build the network, the following window will appear (Total Node in Network and Total Links in Network will vary depending on project):



Note: Geopak Drainage may still build a network even if it has errors. In such cases, a dialog box will appear notifying the designer the network has been built and listing potential errors.

If Geopak Drainage is unable to build the network, a message similar to the one below will appear:



Common errors include a missing component such as a node or link, a network that has more than one outlet or has duplicated links, or a node that has multiple downstream links.

Computations

Two options exist under Computations: Design Network and Analyze Network.



These icons are also located in the Drainage Network toolbox (see Adding Areas above).

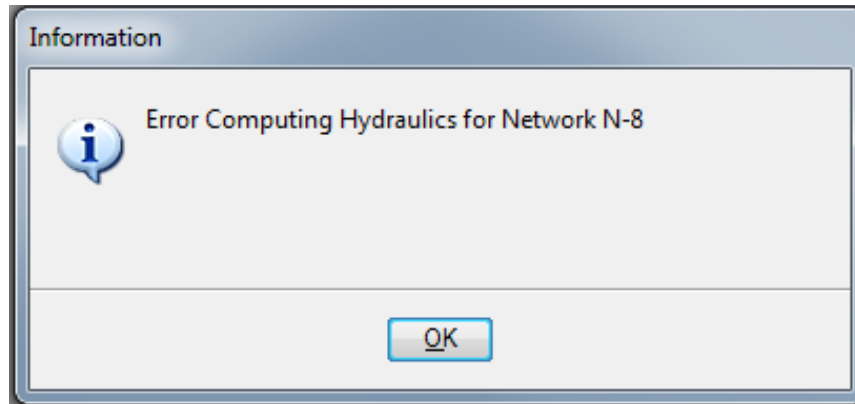
Design Network

Using the Design Network option optimizes the design and adjusts values as needed as long as the velocity and capacity are within limits. Designers should click *Unlock Sizes* and *Unlock Elevations* in the Network Configuration dialog box. Click on *Apply* after performing calculations.

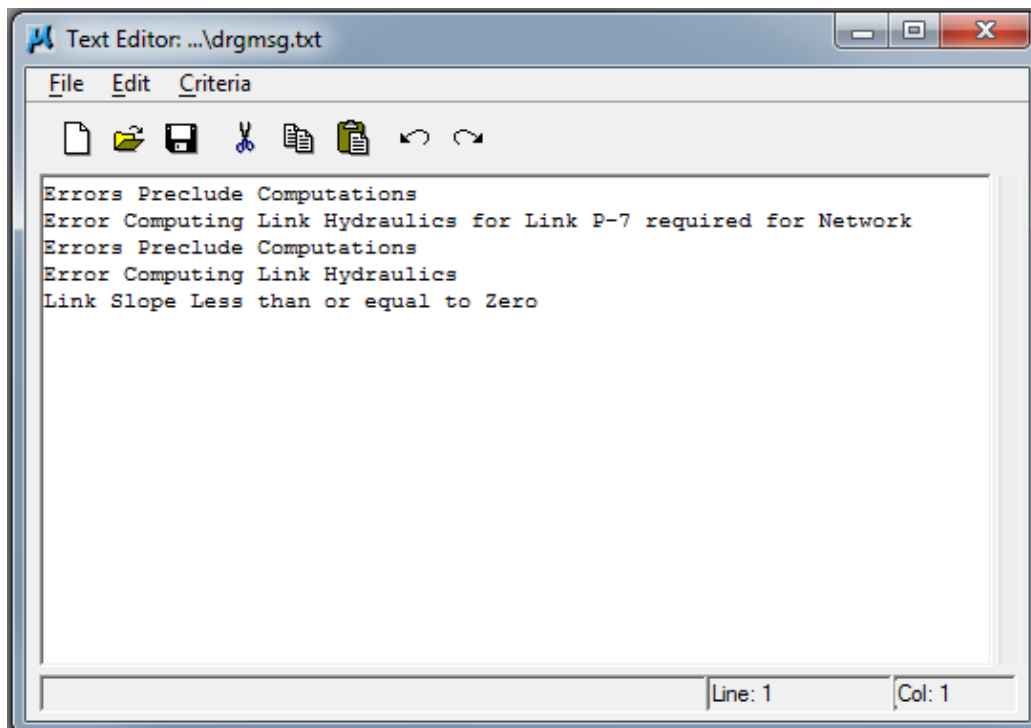
Analyze Network

Using the Analyze Network option keeps the input values the same unless there is a problem with velocity or capacity, in which case adjustments will be made. Designers wanting Geopak Drainage to analyze the network without making changes should click *Lock Sizes* and *Lock Elevations* in the Network Configuration dialog box. This is common when analyzing systems for different storm events. Click on *Apply* after performing calculations.

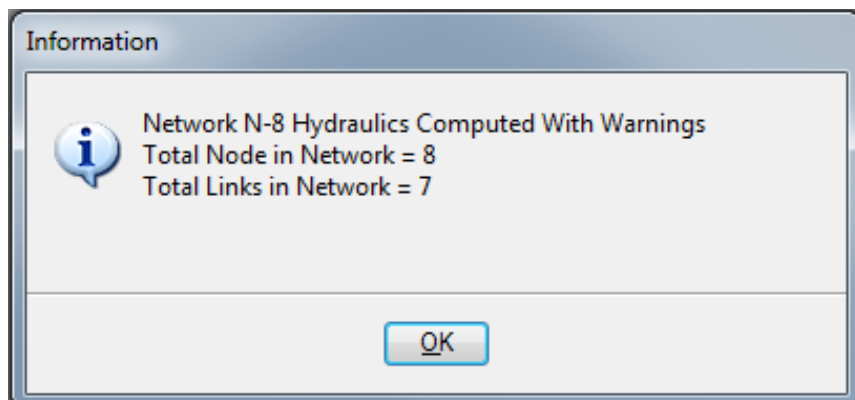
Occasionally, errors occur during the design process. When Geopak Drainage is unable to perform calculations, a message similar to the one below will appear:



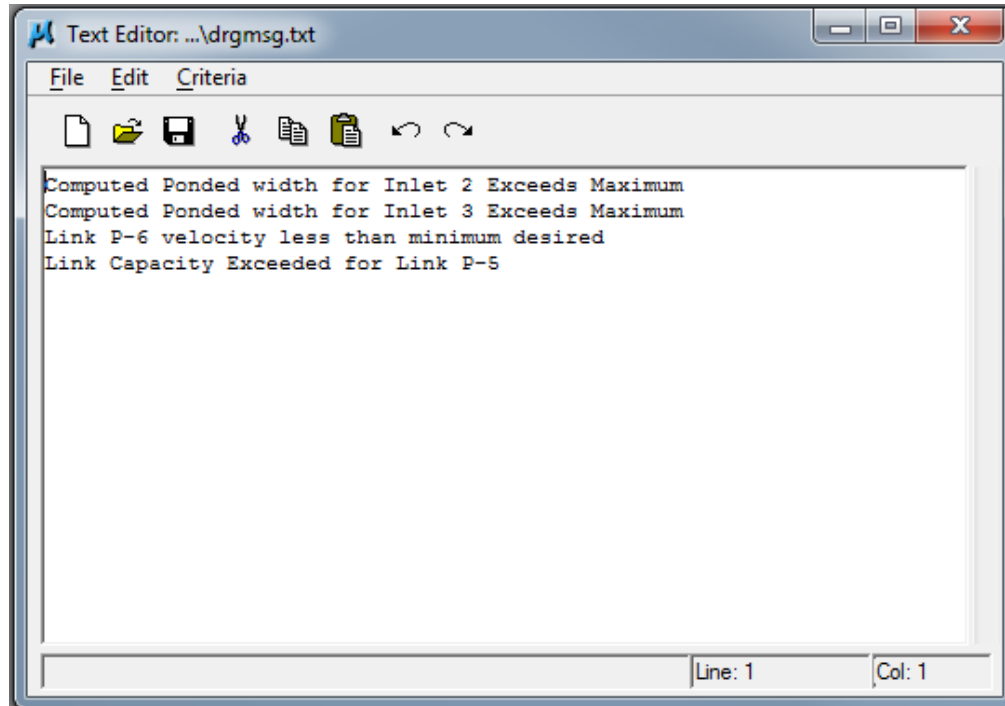
Clicking OK will bring up a window explaining the error (in this case Link P-7 has a reverse slope):



Warnings are common during the design process. They typically do not affect calculations; instead, they warn the designer that certain criteria have been exceeded or not achieved. When warnings do occur, a message similar to the one below will appear:




Clicking **OK** will bring up a window explaining the warnings:

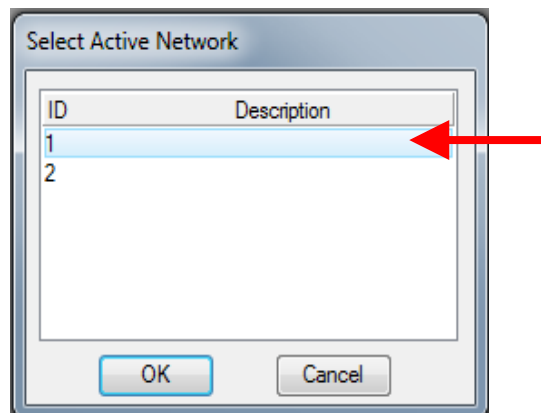


These warnings are saved as a .txt file in the same folder with the .gdf file.

Select Active Network

Selecting a network to be active allows the designer to limit the information viewed to that of the active network. Many of the reporting, query, and navigation tools support the use of Active Network.

Only one network at a time can be active. To set a network as active, click the Set Active Network icon  in the Network Configuration dialog box. The Select Active Network dialog box will appear:



Click on the desired network and click **OK**. The chosen network will become active.

Editing a Network

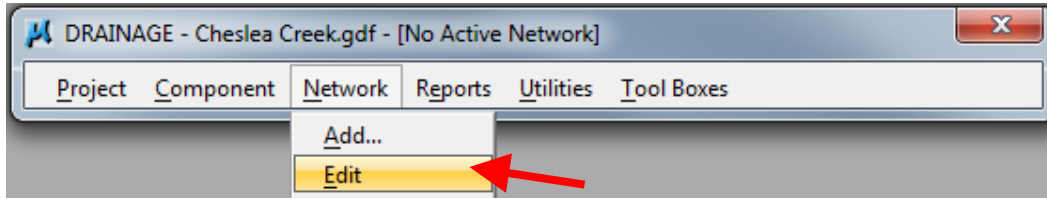
Changes to a network can involve changes to the network itself or changes to components of the network.

Changes to the Network

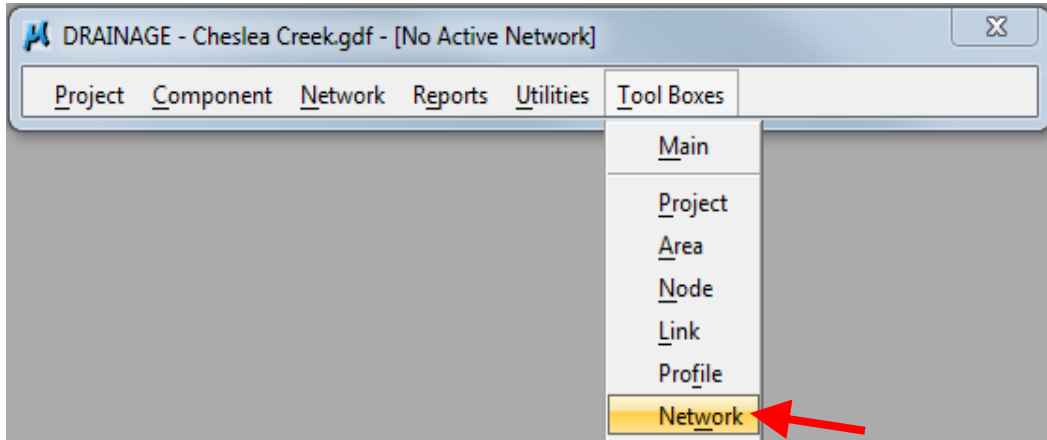
Changes to the network itself typically involve: deleting or renaming a network; building a network after changing components; or designing or analyzing a network after changing components.

Changes are made using the Network Configuration dialog box, which can be accessed in a couple of different ways:

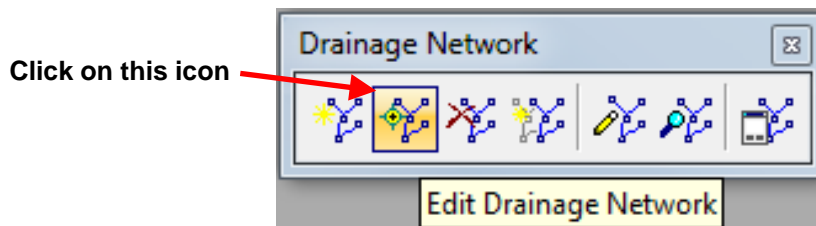
- Using the Network menu on the DRAINAGE dialog box:



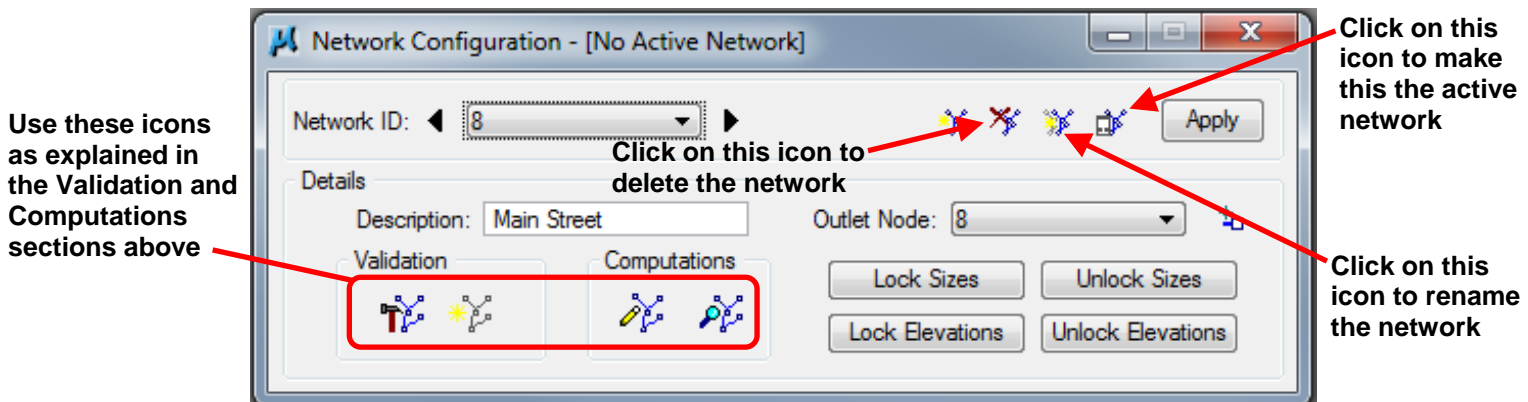
- Using the Drainage Network toolbox accessed through the DRAINAGE dialog box:



The following tool box will appear:

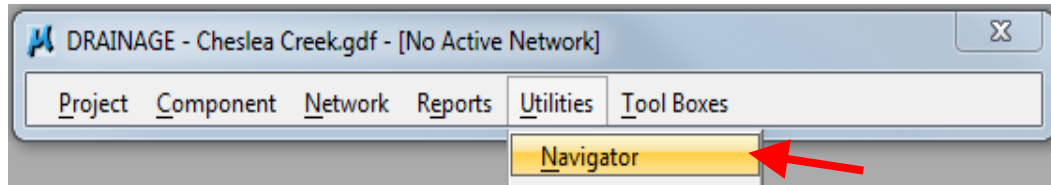


Regardless of the method designers use, the Network Configuration dialog box will appear:



Changes to Components

An effective method for making changes to components is to use the Navigator accessed through the DRAINAGE dialog box (see also Sections [4A-53](#), [4A-54](#), and [4A-55](#) for instructions on editing nodes, areas, and links using the Navigator):



Click *Apply* after making changes.

Chronology of Changes to Design Manual Section:

004a-056 Geopak Drainage – Networks

9/30/2011 Revised
Add in text explaining how to set a network as active.

7/29/2011 NEW
New