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Envision - Education

MicroStation V8i (SELECTseries 1) Fundamentals Exercise Workbook

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Introduction

Welcome to MicroStation V8i Select Series 1 Fundamentals training. This course was developed with the new user in mind. The format for this course is a lecture followed by a set of exercises for the student to accomplish. This will facilitate the learning process and allow the student to further experiment with the program.

Document Conventions

Several conventions are used throughout this document to indicate actions to be taken or to highlight important information. The conventions are as follows:

<u>Item</u>	<u>Meaning</u>
Place Text	a command name or a file that you are to select
Tools > Options	a command path that you are to select – usually from the pull-down menus
Key in	entering data with the keyboard
<i>Document name</i>	style used when referring to another document
Note: Text information about a command or process that you should pay particular attention to	
Emphasis	an important word or phrase
1. Numbered Steps	actions to be performed as part of the lab activities
<D> or Data	press the data button on the mouse
<R> or Reset	press the reset button on the mouse
<T> or Tentative	press the tentative button on the mouse



AutoCAD Tip: In various locations throughout this manual, the author has provided AutoCAD tips. These tips are designed to serve as a reference between AutoCAD and MicroStation terms.



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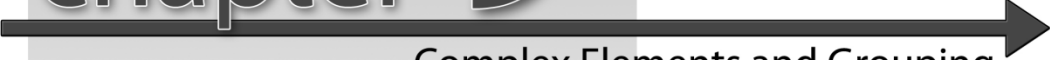
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chapter 9

Complex Elements and Grouping





9. Complex Elements and Grouping

MicroStation Groups

It is a common drafting practice to associate, or “**group**” elements together. Doing this is often beneficial to increase efficiency when modifying or manipulating multiple elements. There are three ways to group elements together in MicroStation:

- *Temporary* – created by making a selection set or by using a fence
- *Semi-permanent* – created by making a complex element or graphic group
- *Permanent* – created by making a cell

Temporary Group

Temporary groups, or selection sets and fencing, are discussed in Chapter 8.

Semi-Permanent Group

A semi-permanent group can be a **Complex Element** or a **Graphic Group**. A semi-permanent group is typically created if multiple elements are to be grouped together, yet still have the ability of modifying or manipulating that group in the future.

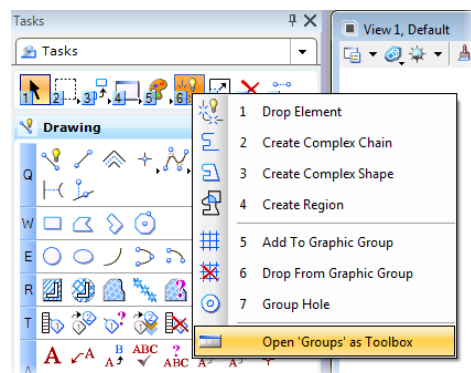
What is a Complex Element?

A **complex element** is created when individual elements are joined together to behave as a single element. An example might include a line, arc, and line string being joined to form a *complex chain* or *complex shape*. Using the **Place Smartline** tool with a rounded vertex type creates a complex element made up of lines and arcs.

Creating Complex Element Status

There are four tools located on the *Groups* toolbox that are designed to add complex status to elements.

Groups Tool box

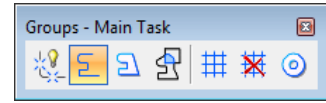




Complex Elements and Grouping

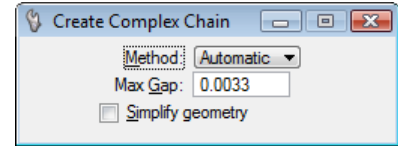
Create Complex Chain

The Create Complex Chain tool joins either lines, line strings, curves, and/or arcs into a single element.



Tool Settings:

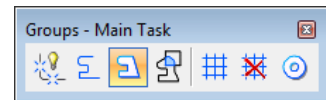
- **Method-Automatic** – will automatically find elements connected to the selected element to create the complex chain.
- **Method-Manual** – elements in the complex chain must be selected individually.
- **Max Gap** – valid only for the Automatic method. A tolerance setting for connecting elements that don't meet exactly end point to end point.
- **Simplify geometry** – will create a single non-complex element if all of the selected elements in the chain are of the same type and do not exceed the maximum allowed vertices.



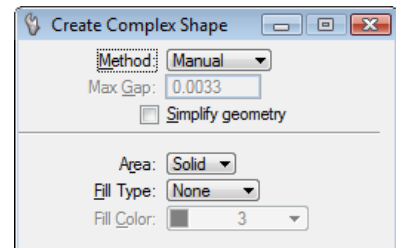
Note: Complex chains are created using the active attributes of the model. So the active attributes of the model should be verified or changed prior to creating a complex chain.

Create Complex Shape

The Create Complex Shape tool joins either lines, line strings, curves, and/or arcs into a single element.



The top tool settings are the same as **Create Complex Chain**. Since this tool creates a closed shape the fill settings (discussed in Chapter 4) are also included.







Note: Complex shapes are created using the active attributes of the model. So the active attributes of the model should be verified or changed prior to creating a complex shape.

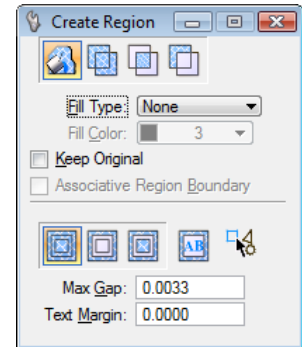
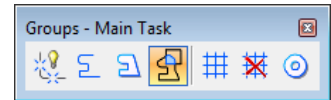


Create Region

The **Create Region** tool creates complex shapes from a variety of elements types. The way in which the **Create Region** tool identifies the area or region to create as the complex shape is based on how the elements are orientated to one another.

Tool Settings:

- **Flood**  – the user clicks a single data point and the region shape is created from nearest enclosing elements (similar to a flood-fill in any paint program).
- **Union**  – region shape is created from area of two or more overlapping shapes.
- **Intersection**  – region shape is created from the intersecting area of two or more overlapping shapes.
- **Difference**  – region shape is created from the difference area of two or more overlapping shapes. The difference region is taken from the first selected shape.
- **Keep Original** – when checked the bounding elements used to create the region are retained, otherwise they are deleted when the region is created.
- **Associative Region Boundary** – the created region shape retains an association with the bounding elements used to create it. This option only applies if Keep Original is checked. (Associative boundaries are discussed further in Chapter 14).
- **Ignore Interior Shapes** – for **Flood** only. Interior shapes are not found, the entire region will be filled.
- **Locate Interior Shapes** – for **Flood** only. Finds interior shapes and identify them as Hole elements so they do no fill.
- **Identify Alternating Interior Shapes** – for **Flood** only. Finds shapes inside of Holes and sets them as Solid so they will fill.
- **Locate Interior Text** – for **Flood** only. When selected area around any text is not filled.
- **Dynamic Interior Locate** – for **Flood** only. The region area to be filled highlights as you move the mouse pointer.
- **Max Gap** – for **Flood** only. A tolerance setting for connecting elements that don't meet exactly end point to end point
- **Text Margin** – for **Flood** only and **Locate Interior Text** only. Defines the margin around the text to be left unfilled.



Note: for **Union**, **Intersection**, and **Difference** regions press <D> to select the first two shapes in a region, then press [Ctrl] + <D> to select the third and subsequent shapes.

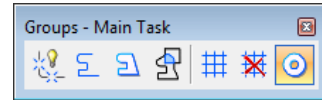


Complex Elements and Grouping

Group Hole


The **Group Hole** tool creates a relationship between a boundary element and a hole or group of holes (i.e. circles, ellipses, shapes, and/or complex shapes).

When this type of relationship is established, the hole element(s) will always appear as a hole when the boundary element is patterned, hatched, or filled.



Dropping Complex Element Status

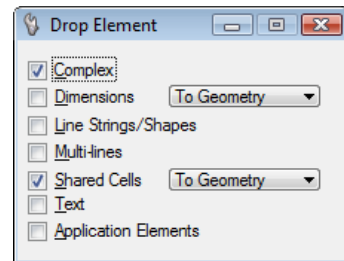
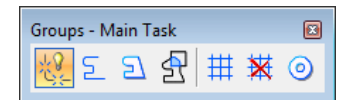
Sometimes it might prove beneficial to “drop” the association of a complex element, making the individual elements act independent of one another. This can be accomplished from the *Groups* toolbox or the *Fence* toolbox.



AutoCAD Tip:
Drop Element
is the same as
Explode
in AutoCAD.

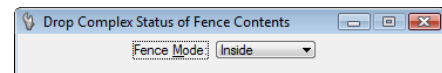
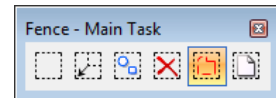
Drop Element

The complex status of a variety of different elements can be “dropped” by using the **Drop Element** tool. To drop a specific type of element, the appropriate check box needs to be activated in the Tool Settings window and then the element(s) to be dropped is selected.



Drop Complex Status of Fence Contents

The **Drop Complex Status of Fence Contents** tool drops complex elements to their individual element status. The elements that are dropped are defined by the fence *mode* options that are available in the Tool Settings window.



Note: A fence must be placed in the drawing to be able to use this tool.

Graphic Groups

What is a Graphic Group?

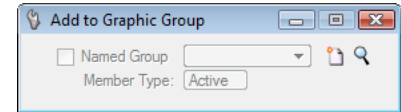
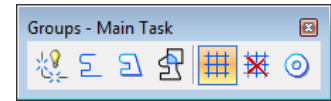
A **graphic group** is a collection of elements that are grouped together by an ID number. When the **Graphic Group Lock** is turned on all elements in the same graphic group are treated as a single element. When the Graphic Group Lock is turned off the elements are treated individually. **Quicksets** and **Named Groups** are extensions of graphic groups.



Add to Graphic Group

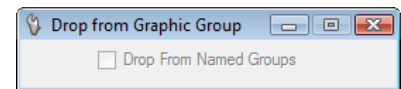
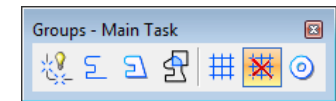
The **Add to Graphic Group** tool can be used to:

- Create a new graphic group
- Add elements to an existing graphic group
- Combine two or more graphic groups to make a single graphic group



Drop from Graphic Group

The **Drop from Graphic Group** tool is used to remove one or more elements from an existing graphic group. It can also be used to drop the entire graphic group completely.



Note: When the graphic group lock is off, individual elements can be removed from the graphic group. When the graphic group lock is on, the entire graphic group is dropped.

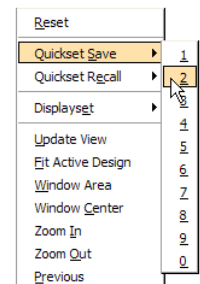
Quicksets

Selection sets can be saved in MicroStation. A saved selection set is known as a **quickset**. Up to 10 different quicksets can be saved per model. A quickset is also considered a *named group*, which makes managing or recalling a quickset easier. Named groups are discussed in the next section of this chapter.

Creating Quicksets

To create a *quickset*:

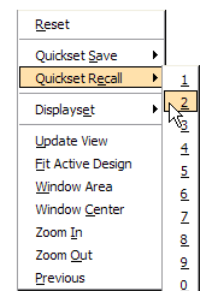
1. Make a selection set of existing elements.
2. Access the *View Control* floating menu by pressing [Shift] + <R>.
3. Choose, **Quickset Save** and then a number.



Recalling Quicksets

Recalling a quickset will activate, or recall, the selection set that was saved when the quickset was created. A quickset can be recalled 3 different ways:

- From the *View Control* floating menu; which is accessed by pressing [Shift] + <R>.
- Press the [Ctrl] key and the appropriate quickset **number** on the keyboard.
- Double-click on the appropriate quickset in the *Named Groups* dialog box.

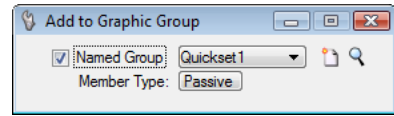





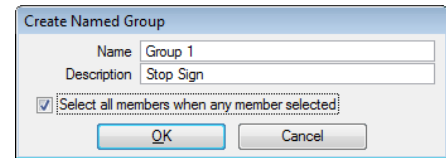
Complex Elements and Grouping

Named Groups

A **named group** is simply a *graphic group* or *quickset* that has been assigned a name. They can also be thought of as named *selection sets*. A named group can be created from the **Add to Graphic Group Tool Settings** window.



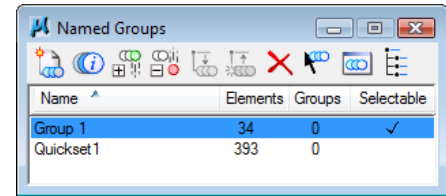
By selecting the **Create New Name Group** button , the *Create Named Group* dialog box will appear. Enter the Name and Description then click **OK**. It is usually a good idea to select the *Select all members when any member selected* checkbox.













Named Groups dialog

Named groups are managed from the *Named Groups* dialog box by choosing, **Utilities > Named Groups**.

Toolbar icons:



- **New Named Group**  – create a new named group entry.
- **Show Named Group**  - shows element information for all elements in the group (Element Information is discussed in Chapter 10).
- **Add Elements**  – adds elements in current selection set to the named group.
- **Remove Elements**  – removes elements in current selection set from the named group.
- **Add to Parent**  – adds the named group as a child named group to parent named group.
- **Remove from Parent**  – removes the named group as a child of the parent group.
- **Remove Named Group**  – removes the named group.
- **Select Elements**  – selects all elements in the named group.
- **Put in Displayset**  – adds the elements in the named group into a Displayset. Displaysets are discussed in the next section.
- **Show Hierarchy**  – displays hierarchical tree structure showing nesting of named groups. This command button will appear again in other dialogs in the following chapters.

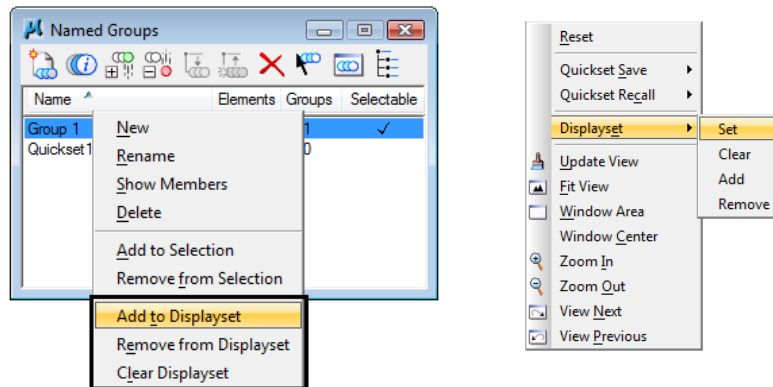
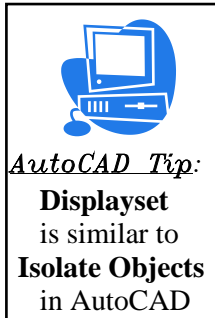


Displaysets

Displaysets are a way to isolate the display of *Selection Sets* or *Named Groups* in a view window. Using displaysets you can turn off the display of all elements except for those in the displayset. Each file can only have a single displayset, it is not possible to save and recall multiple displaysets. *Named Groups* can be used as a means to store, name, and manage elements to be used in displaysets.

Managing Displaysets

Displaysets can be managed from the *Named Groups* dialog by right clicking on a named group or from the *View Control* pop-up menu ([Shift] + <R> menu).



There are a few simple tools for working with displaysets:

- **Set** – clears the current displayset and adds the selected elements.
- **Add** – adds the selected elements to the displayset.
- **Remove** – removes the selected elements from the displayset.
- **Clear** – clears all elements from the displayset.

Using the *Named Groups* dialog the elements added to and removed from the displayset are those in the selected named group. Using the *View Control* pop-up menu the elements added to and removed from the displayset are those in the current selection set.

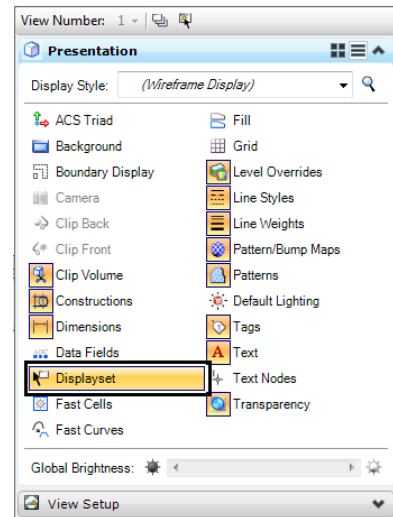


Complex Elements and Grouping

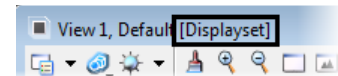
Viewing Displaysets

Viewing displaysets is controlled through the *View Attributes* dialog. Turning on the *Displayset* toggle will turn off the display of all elements in the view except for those in the displayset. Turning off the *Displayset* toggle will restore the display of all elements in the view.

If the *Displayset* toggle is turned on and there are no elements in the displayset all elements are viewed as they would be normally.



When the displayset view attribute is on the text **[Displayset]** is added to the end of the view window title bar.



Permanent Group

A permanent group, cells, can be created by the **Group** command or by the use of a **Cell Library**. Cell Libraries are discussed in Chapter 13.

Group Command

The **Group** command is used to “group” multiple individual elements together if no future modifications are necessary. The **Group** command can be accessed by choosing, **Edit > Group** from the MicroStation pull-down menu. This command creates an unnamed cell which has no parent cell library, as a result these are also referred to as *orphan cells*.

Note: the **Group** command is enabled only when there is an active selection set.

Ungroup Command

The **Ungroup** command is used to “ungroup” existing cells that were created using the **Group** command. The **Ungroup** command can be accessed by choosing, **Edit > Ungroup** from the MicroStation pull-down menu.



Lab 9 – Complex Elements and Grouping

Objectives

The purpose of this lab will be to:

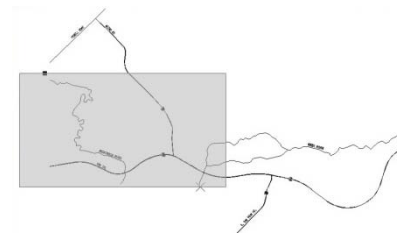
- Create a complex chain.
- Create a complex shape
- Drop complex status of an element.
- Group and ungroup elements.
- Add and remove elements from a graphic group.

Open the Design File

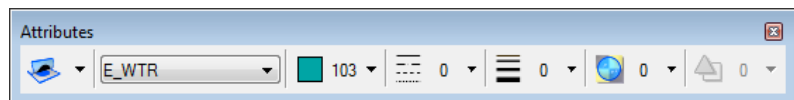
1. Open **MicroStation Manager** or the **Open** dialog box.
2. Set the directory to:
C:\Envision\MicroStation V8i (SELECTseries 1)\Fundamentals\CIVIL
3. Select the file named:
Project_Mapping.dgn
4. Select **Open**.

Create a Complex Chain

1. **Window** into the area as shown.

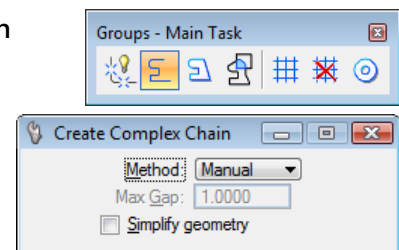


2. Set the *active* attributes as shown.



Note: When a complex chain and/or shape is created, it is created with the active attribute settings. This is why you set the attributes as desired in the first step.

3. Select the **Create Complex Chain** tool [6,2].
4. Set the *Method* to **Manual**.

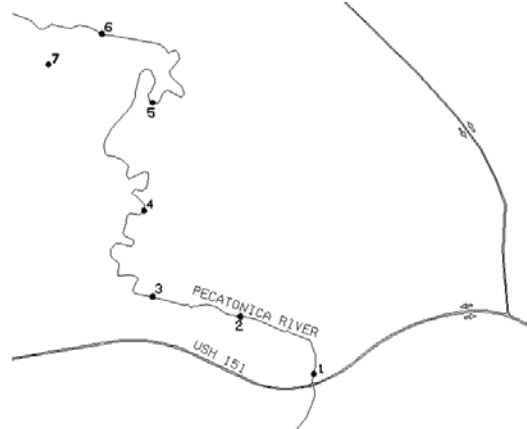




Complex Elements and Grouping

Create a complex chain out of the individual elements making up the river.

5. <D> on the elements to be included as part of the complex chain (points 1-6).
6. <D> to accept the command (point 7).



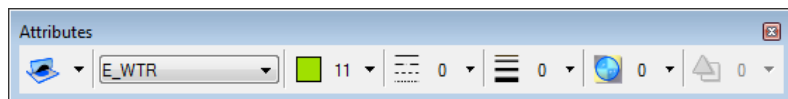
7. Hover over the newly created complex chain to see the popup info for verification that the complex chain was created.



8. **Window** into the area as shown.



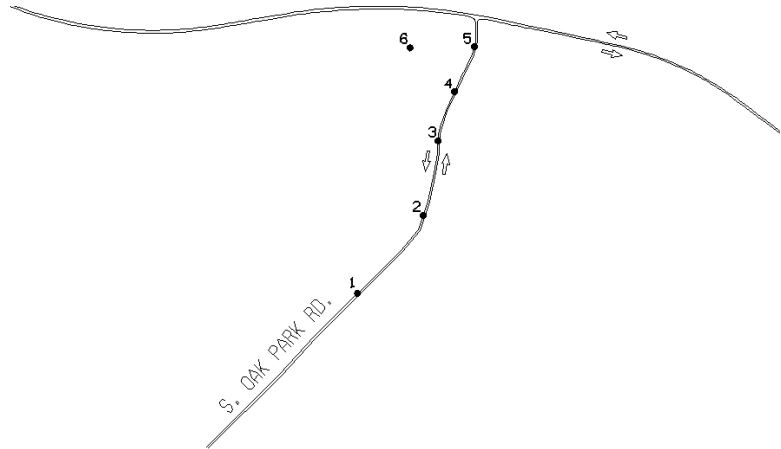
9. Set the *active* attributes as shown.





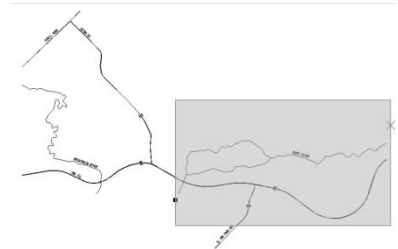
Complex Elements and Grouping

10. Create another complex chain using the segments making the *left* edge of road. Follow the same procedure you just used, steps #3-#6, to create the complex chain. You may want to use several viewing tools to ensure that you select the correct elements.

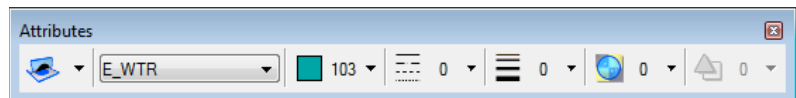


11. Using the same procedure you just used, create another complex chain using the segments making the *right* edge of road.

12. **Window** into the area as shown.



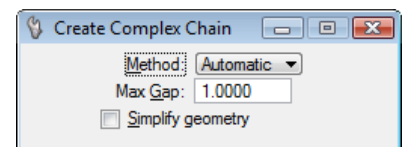
13. Set the *active* attributes as shown.



14. Select the **Create Complex Chain** tool [6,2] (if not already selected).

15. Set the *Method* to **Automatic**.

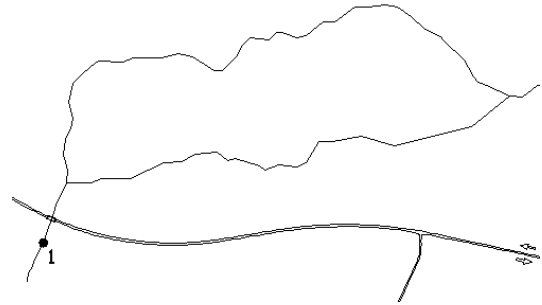
16. Set the *Max Gap* value to **1**.





Complex Elements and Grouping

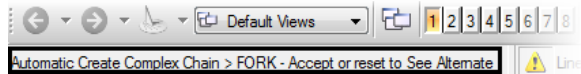
17. <D> the element to be included as part of the complex chain (point 1).



18. <D> anywhere on the screen to allow MicroStation to identify the next element(s) to be included in the chain (points 2, 3).



Notice that when point 3 is administered, a fork in the elements is identified in the command prompt.



You now have the option to accept the element that is highlighted or change the highlight to include the other element of the fork instead.

19. You do not want to include the last highlighted element, so <R> to deselect the last highlighted element and the other element in the fork will be highlighted (point 4).



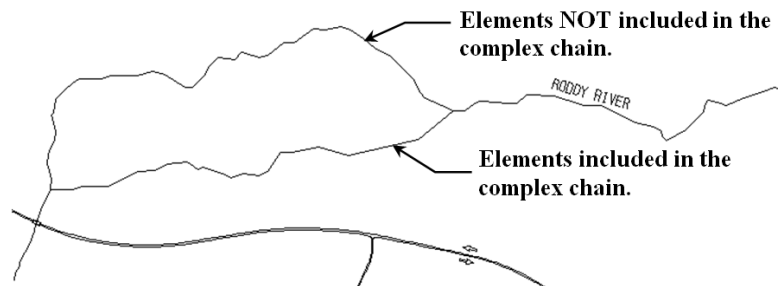


Complex Elements and Grouping

- 20. <D> to continue with automatically highlighting the next element (point 5).
- 21. <D> to accept the complex chain (point 6).



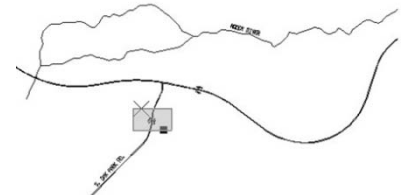
A complex chain is now created.



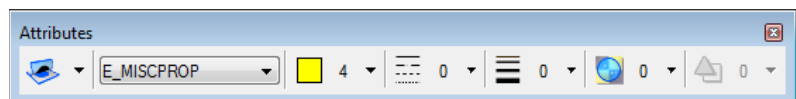
Create a Complex Shape

The procedure for creating a complex shape is very similar to that of creating a complex chain.

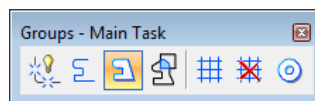
- 1. **Window** into the area as shown.



- 2. Set the *active* attributes as shown.



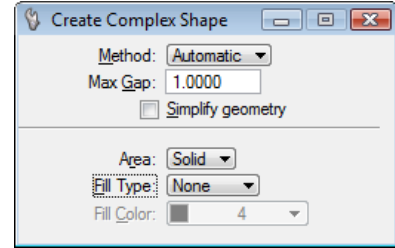
- 3. Select the **Create Complex Shape** tool [6,3].



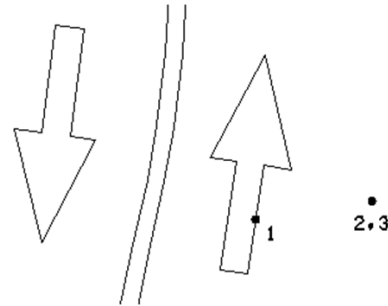


Complex Elements and Grouping

- Set the *Method* to **Automatic**, enter a *Max Gap* value to of **1**. Set the *Fill Type* option to **None**.

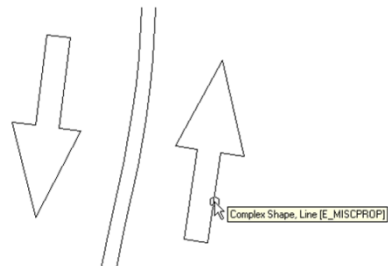


- <D> the element shown (point 1). This identifies the start of the complex shape.
- <D> anywhere on the screen to allow MicroStation to automatically highlight the rest of the shape (point 2).



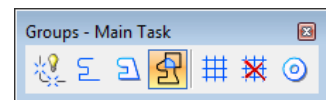
- To accept the highlighted elements as the elements of the shape, <D> somewhere on the screen (point 3).

- Hover over the newly created complex shape to see the popup info for verification that the complex shape was created.

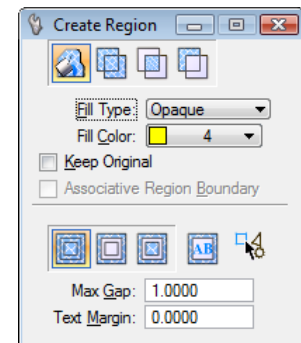


One of the main reasons to create a complex chain versus a complex shape is that fill can be added to a complex shape. In the previous example, you could have set the options in the Tool Settings window so that a filled complex shape was created. However, in the next example you will create a filled shape using the **Create Region** tool.

- Select the **Create Region** tool [6,4].



- Select the **Flood** icon.
- Set the *Fill Type* option **Opaque**.
- Set the *Fill Color* option to **4**.
- Enter a *Max Gap* value to of **1**.



Lab Continues



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