

# chapter 8

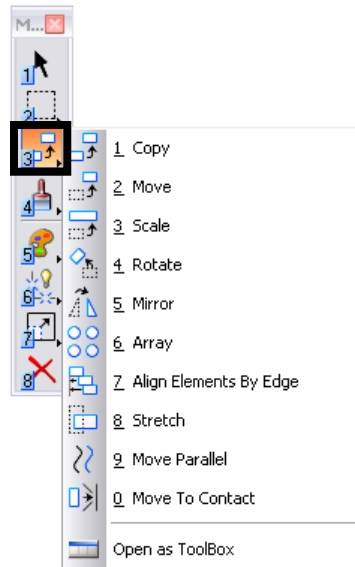
Modifying and Manipulating Elements





## 8. Modifying and Manipulating Elements

### Manipulate Tool Box



#### *Copy Element*

The **Copy** tool duplicates an existing element and places it into the design file. Multiple copies of an element can be placed by specifying the quantity into the Tool Settings window. Multiple elements can be duplicated at the same time with the use of a selection set or fence (selection and fences are discussed in Chapter 9).

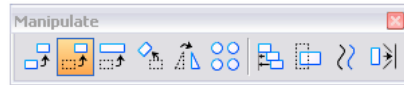


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## Modifying and Manipulating Elements

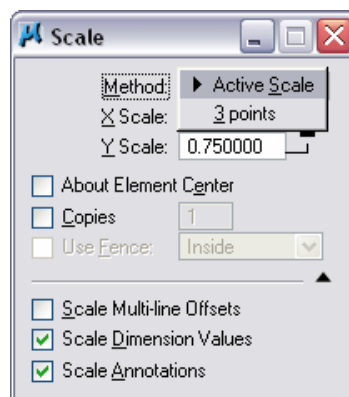
### *Move Element*

The **Move** tool takes an existing element and changes the location in the design file. Multiple elements can be moved at the same time with the use of a selection set or fence.



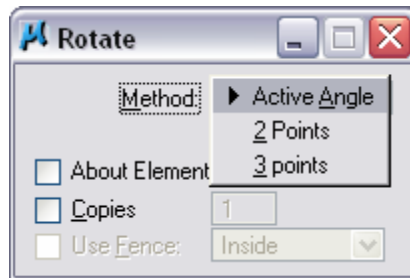
### *Scale*

The **Scale** tool resizes elements either proportionally or by a defined coordinate directional value. Elements can also be scaled interactively. Multiple elements can be scaled at the same time with the use of a selection set or fence. By activating the Copies check box, an element can be copied when it is scaled. By activating the About Element Center check box, the element will be scaled based on the center location of the element. You can also elect to annotate Multi-line Offsets, Dimension Values or Annotations by activating the appropriate check box(es).

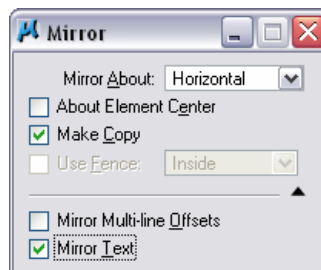


***Rotate***

The **Rotate** tool rotates elements by an active angle, by 2 points, or by 3 points. Multiple elements can be rotated at the same time with the use of a selection set or fence. By activating the Copy check box, an element can be copied when it is rotated. By activating the About Element Center check box, the element will be rotated based on the center location of the element.

***Mirror***

The **Mirror** tool mirrors an element by a vertical, horizontal, or manually defined axis. Multiple elements can be mirrored at the same time with the use of a selection set or fence. By activating the Make Copy check box, an element can be copied when it is mirrored. When the Mirror Text check box is activated, text can be mirrored as well.



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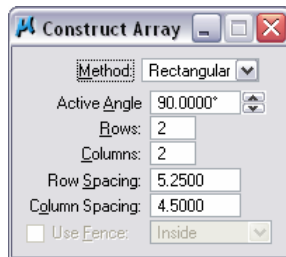
## Modifying and Manipulating Elements

### Construct Array

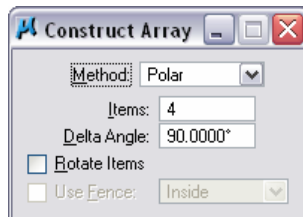
The **Construct Array** tool makes multiple copies of an element and places them in a defined pattern. There are two types of array pattern options, *rectangular* and *polar*. Multiple elements can be arrayed at the same time with the use of a selection set or fence.



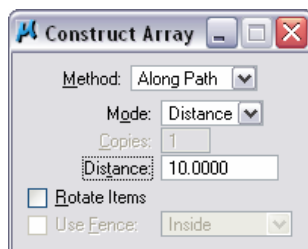
- **Rectangular Array**



- **Polar Array**



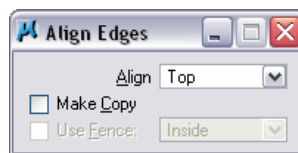
- **Along Path Array**



### *Align Edges*

The **Align Edges** tool aligns the edge of an element to the edge of another element. Multiple elements can be aligned at the same time with the use of a selection set or fence. Under the Align option, elements can be aligned based on several of the following alignment options:

- Top
- Bottom
- Left
- Right
- Horizontal Center
- Vertical Center
- Both Centers



### *Stretch Element*

The **Stretch Element** tool is used to stretch portions of elements found inside a fence. Those parts of the element found outside the fence do not move.

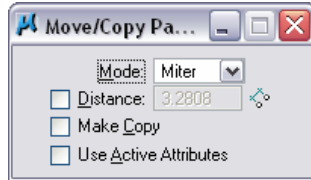


## Modifying and Manipulating Elements

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### *Move/Copy Parallel*

The **Move/Copy Parallel** tool can move or copy an element while remaining parallel to the original element. The distance of the move/copy can be predefined or placed interactively. Also, the elements can be placed using the active attributes or placed using the attributes of the original element.

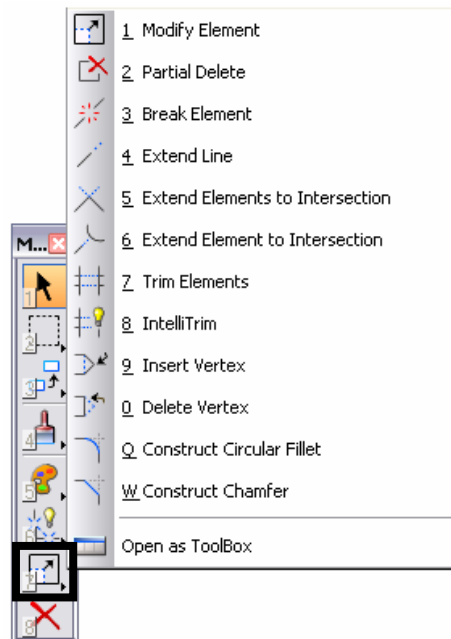


### *Move to Contact*

The **Move to Contact** tool can move one or more elements in a defined direction until they make contact with another element. If no element is in the path defined, the element does not move.

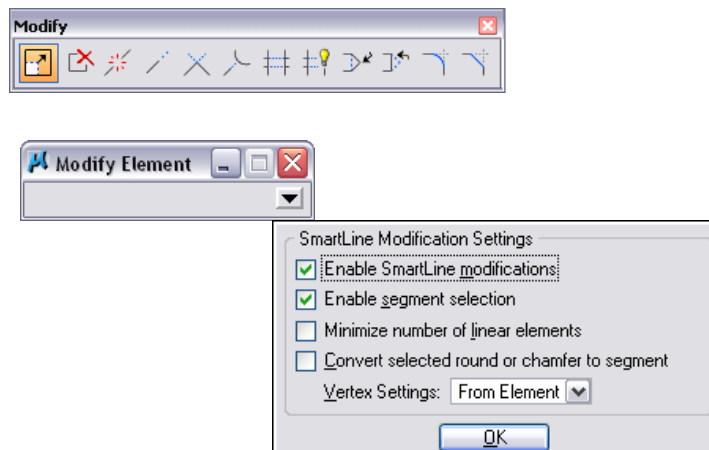


## Modify Tool Box



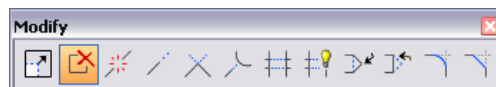
### Modify Element

The **Modify Element** tool changes the location of element by redefining the geometry. This tool can be used differently depending on the type of element that is to be modified.



### Delete Part of Element

The **Delete Part of Element** tool removes a specific part of an element.



## Modifying and Manipulating Elements

### *Break Element*

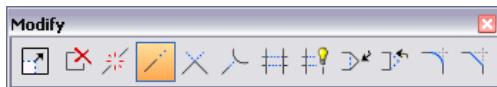
The **Break Element** tool can be used to break a linear element at a defined point. Tool cannot be used on circular elements.



### *Extend*

The **Extend** tool can extend the length of lines, line strings, or multi-lines. The axis of the line is maintained when using this tool. The length can be predefined in the distance field of the Tool Settings window or determined interactively. If the *From End* option is off, the overall length of the element can be defined. If the *From End* option is on, the length of the element can be defined from the end of an element. The **From End** option only works when the *Distance* option is off.

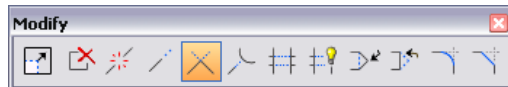
**Note:** The **Extend** tool can also be used to *shorten* elements by typing in a negative value in the distance field or by shortening the element interactively.



### *Extend Two Elements to Intersection*

The **Extend Two Elements to Intersection** tool extends two non intersecting elements to their point of intersection.

**Note:** The **Extend Two Elements to Intersection** tool can also be used to *trim* intersecting elements to their point of intersection. When trimming with this tool, the part of the element that is identified is the portion of the element that is to be kept, not trimmed.



### *Extend Element to Intersection*

The **Extend Element to Intersection** tool extends an element to a non intersecting element until they form a point of intersection.

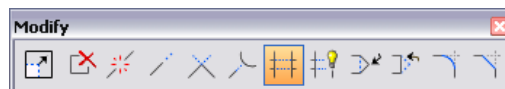
**Note:** The **Extend Element to Intersection** tool can also be used to *trim* an element that intersects with another element to the point of intersection. When trimming with this tool, the part of the element that is identified is the portion of the element that is to be kept, not trimmed.



### *Trim Element*

The **Trim Element** tool trims an element to the intersection of another element. To trim an element with this tool, a cutting element is first defined and then the part of the other element that is to be removed is defined.

**Note:** Multiple cutting elements can be used.



### *IntelliTrim*

The **IntelliTrim** tool trims, extends, or cuts multiple elements in one operation. There are two types of modes for using the IntelliTrim tool, *Quick* and *Advanced*.



- **Quick**

The *quick* mode uses only one cutting element. A temporary line is created to select the appropriate element(s) to be trimmed, extended, or cut.

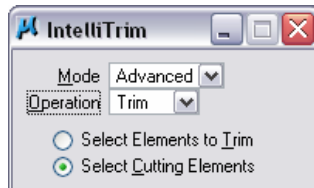


## Modifying and Manipulating Elements

### Advanced

The *advanced* mode allows multiple cutting elements. Element that are to be trimmed or extended are selected individually. The cut operation is disabled in the advanced mode.

**Note:** Trimming or cutting elements can be preselected using the **Element Selection** tool, preventing elements from having to be selected individually.



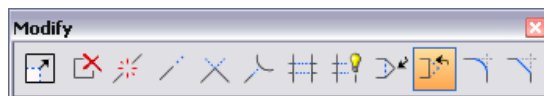
### Insert Vertex

The **Insert Vertex** tool adds a vertex to a line, line string, multi-line or shape. It can also be used to add a segment to an existing line or line string.



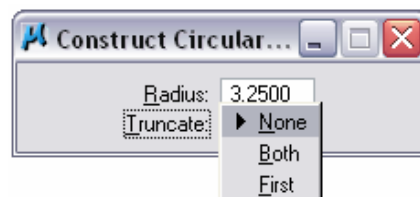
### Delete Vertex

The **Delete Vertex** tool deletes a vertex from a line, line string, multi-line or shape.



### Construct Circular Fillet

The **Construct Circular Fillet** tool creates an arc at the intersection of two elements. The size of the arc can be specified. One element, both of the elements, or neither of the elements can be truncated when creating the fillet.

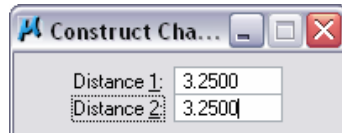


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## Modifying and Manipulating Elements

### *Construct Chamfer*

The **Construct Chamfer** tool creates a chamfer line between two elements. Each element's distance from the point of intersection is defined to make up the size of the chamfer line.



## **Lab 8 – Modification and Manipulating Elements**

### **Objectives**

*The purpose of this lab will be to:*

- Practice using manipulation tools.
- Practice using modification tools.

### **Open the Design File**

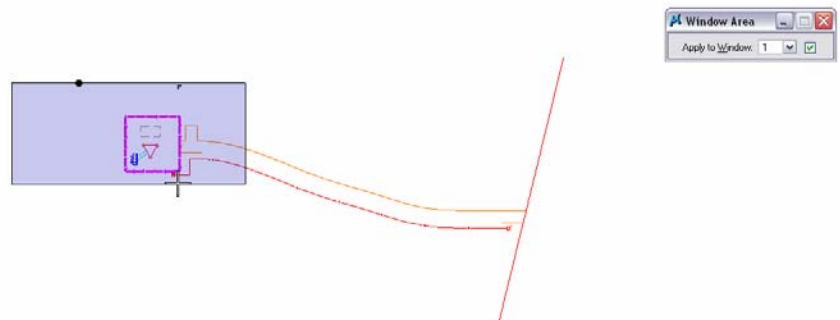
1. Open **MicroStation Manager** or the **Open** dialog box.
2. Set the directory to:  
**C:\Envision Group\_Training\MS XM Fundamentals\CIVIL**
3. Select the file named:  
**Project\_Site Layout.dgn**
4. Select **Open**.

### **Manipulate Elements in the Site Layout**

1. Activate **AccuDraw** (from the Primary Tools tool box) if it is not already enabled.



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



Make copies of the existing tree.

3. Select the **Copy** tool [3,1].

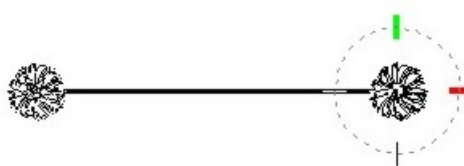
## Modifying and Manipulating Elements



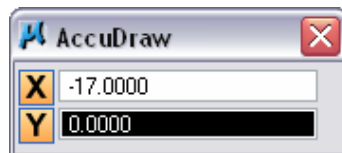
- Enter **5** for the amount of copies to be made.



- <D>** on the tree.
- With using AccuDraw, **nudge** left to index the on-the-fly horizontal axis.



- Enter **17** into the AccuDraw window to specify the distance the copy is to be made from the original tree (MicroStation automatically changes the value to -17 to indicate a movement to the left).



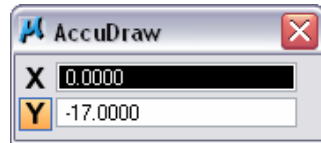
- <D>** to create the copies.



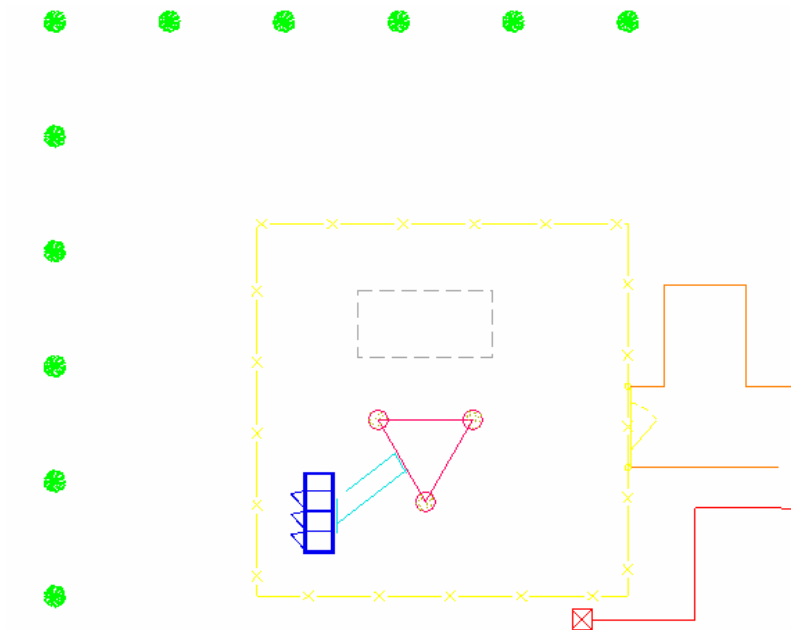
- <R>** to complete the command.
- <D>** on the last tree that was created (tree farthest to the left).
- Nudge** the pointer down.



12. With the on-the-fly vertical axis indexed, type **17** (MicroStation automatically changes the value to -17 to indicate a downward movement).



13. **<D>** to create 5 more copies.



14. **<R>** to complete the command.