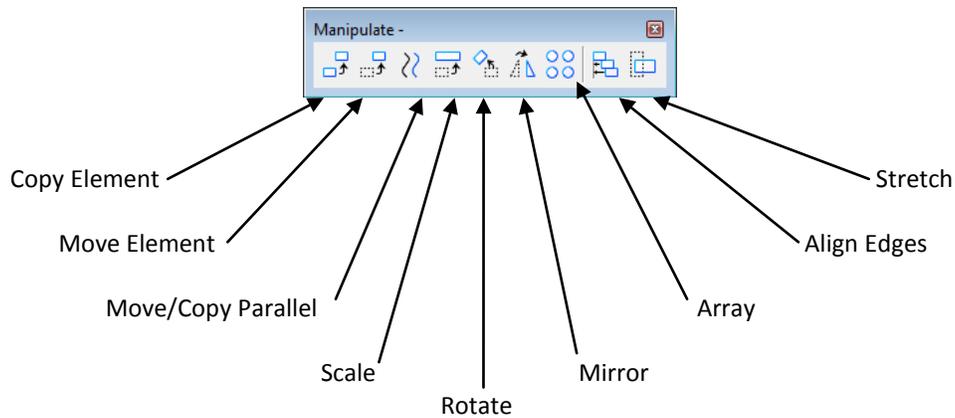


## 7.0 Manipulate Elements tool box

The tools in the Manipulate tool box are used to copy, move, resize, rotate, and/or mirror elements.



### 7.1 Copy Element



Used to copy an element(s).

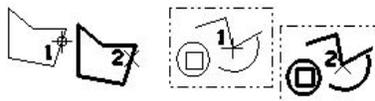
Tool Settings	Effect
Copies	Sets the number of copies to create.
Use Fence	If on, the fence contents are copied. The option menu sets the Fence (Selection) Mode.

#### To copy an element(s)

- 1) Select the *Copy* tool.
- 2) Identify the element.
- 3) Enter a data point to position the copy.

#### Alternative Method – To copy an element(s)

- 1) Select or fence the element(s).
- 2) Select the *Copy* tool.
- 3) Enter a data point to define the origin for the copy.
- 4) Enter a data point to position the copy.



## MicroStation V8i – Manipulate Elements

*Copy tool. Left, identifying an element to copy. Right, copying the fence contents with Use Fence on.*

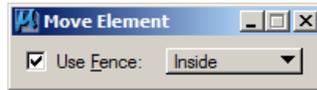
When you do not require precision, you can copy one or more selected elements by selecting them and dragging one of the elements by any point on the element except the handles while holding down the <Ctrl> key. (First start dragging and then press the key.)

Choosing Copy from the Reset pop-up menu selects the *Copy Element* tool. When the tool is selected in this manner, the copy operation affects all selected elements.

If you copy elements from an attached reference, the elements' levels will be copied if only they do not exist in the active model. To change how levels are handled, choose Preferences from the Workspace menu and select the Reference category.

### 7.2 Move Element

Used to move an element(s).



Tool Settings	Effect
Use Fence	If on, the fence contents are moved. The option menu sets the Fence (Selection) Mode

#### To move an element

- 1) Select the *Move* tool (be sure Use Fence is off).
- 2) Identify the element.
- 3) Enter a data point to reposition the element.

#### To move one or more selected elements

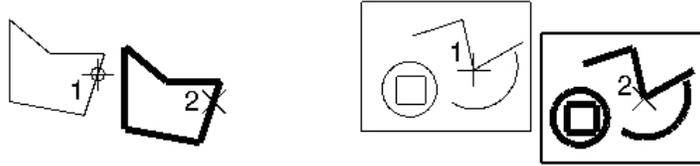
- 1) Select the element(s).
- 2) Select the *Move* tool.  
Be sure Use Fence is off.
- 3) Enter a data point to define the origin for the move.
- 4) Enter a data point to define the distance and direction of the move.  
The element(s) are repositioned.

#### To move fence contents

- 1) Place a fence around the element(s).
- 2) Select the *Move* tool.  
Be sure Use Fence is on.
- 3) Enter a data point to define the origin for the move.

## MicroStation V8i – Manipulate Elements

4) Enter a data point to reposition the fence contents.

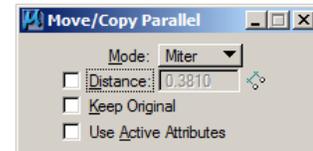


Move tool. Left, identifying an element to move. Right, moving the fence contents with Use Fence on.

When you do not require precision, you can move one or more selected elements by selecting them and dragging one of the elements by any point on the element except the handles.

Choosing Move from the Reset pop-up menu selects the *Move Element* tool. When the tool is selected in this manner, the move operation affects all selected elements.

### 7.3 Move/Copy Parallel



Used to move or copy an element (line, line string, multi-line, curve, arc, ellipse, shape, complex chain, or complex shape) parallel to the original.

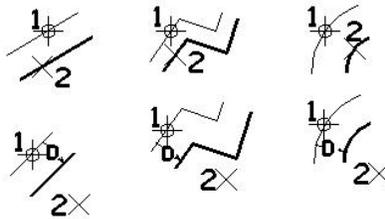
Tool Settings	Effect
Mode	<p>Determines the method by which the gap created, by moving two connected elements to a parallel location, is filled.</p> <ul style="list-style-type: none"> <li>• Miter — Extends or shortens connecting segments while maintaining the angle of their connections.</li> <li>• Round — Fills the gap with a rounded arc between the two moved elements.</li> <li>• Original — Fills the gap in the same manner as the MicroStation/J implementation of this tool; the resulting element is the same type as the original element.</li> </ul> <p>For some element types — for example, ellipses — Original does not produce a true parallel offset. With an ellipse Miter or Round results in a B-spline, a true parallel offset, rather than an ellipse.</p>
Distance	If on, sets the distance to move.
Define Dist(ance)	Clicking the Define Dist button lets you define the distance to move, graphically with two data points. When you have defined the distance, the Distance setting is turned on automatically and the defined distance value is displayed in its field.
Keep Original	If on, the original elements are not manipulated.
Use Active Attributes	If on, the moved or copied element takes on the active attributes. If off, the moved or copied element retains the attributes of the existing element.

## MicroStation V8i – Manipulate Elements

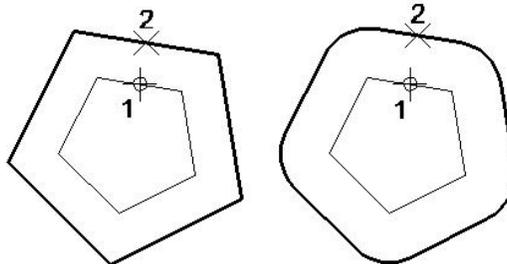
### To move or copy an element parallel to the original

- 1) Select the Move/Copy Parallel tool.
- 2) Identify the element.
- 3) Enter a data point.

Distance	Defines
Off	Distance and direction.
On	Direction only.



*Move/Copy Parallel tool. (Above) Top: Defining distance with a data point (Distance off) and Gap Mode set to Mitered. (Above) Bottom: Distance is keyed in (Distance on). In illustrations, Make Copy is on.*



Comparison of using the Move/Copy Parallel tool with Gap Mode set to Mitered (left) and Rounded (right).

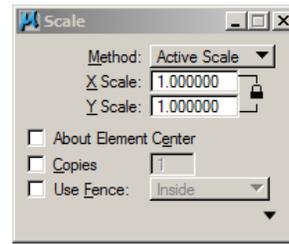
### To move or copy an element, parallel to the original, by a graphically defined distance

- 1) Select the Move/Copy Parallel tool.
- 2) Click the Define Dist button.
- 3) Define the required distance with two data points.
- 4) Identify the element.
- 5) Define the direction to move or copy the element.

You can instead use the Move Element tool in conjunction with AccuDraw to constrain element movement.

## MicroStation V8i – Manipulate Elements

### 7.4 Scale



Used to resize an element(s). Elements can be scaled individually, as a selected group, or within a fence. When About Element Center is turned on, selected elements are scaled about their (individual) center points.

Tool Settings	Effect
Method	<p>Sets the method used to scale an element.</p> <ul style="list-style-type: none"> <li>Active Scale — Scale by the active scale factors (X Scale, Y Scale, and Z Scale). If a scale factor is 0-1 (for example, 0.25), size in that direction is decreased; if a scale factor is greater than 1, size in that direction is increased.</li> <li>3 points — Scale graphically, through the entry of three data points. The scale factors are computed by dividing the distance between the first and third points by the distance between the first and second points.</li> </ul>
X Scale	Scale factor along view x-axis (horizontal), when Method is Active Scale.
Y Scale	Scale factor along view y-axis (vertical), when Method is Active Scale.
Z Scale	(3D only) Scale factor along view z-axis (depth), when Method is Active Scale.
Proportional	(Method set to 3 points only) If on, the element(s) proportions are maintained.
About Element Center	<p>If on, in Extended Information section of tool settings, the selected element(s) is scaled about its center point instead of a selected point. Cells and text elements are scaled about their origins.</p> <p>Elements may be selected individually, or you can select multiple elements to scale in a selection set or using a fence. Where multiple elements are selected, they all will be scaled about their own center points.</p>
Copies	If on, the element(s) are copied and the copy(s) are scaled; the original(s) are not manipulated. The adjacent field sets the number of scaled copies to create.
Use Fence	If on, the fence contents are scaled. The option menu sets the Fence (Selection) Mode.
Scale Multi-line Offsets	If on, multi-line offsets are scaled (for example, to scale wall thickness when resizing a room).
Scale Dimension Values	<p>If on, dimension values are modified to reflect the size of the scaled dimension.</p> <p>If off, only the dimension elements are scaled, while the dimension value remains unchanged.</p>
Scale Annotations	<p>If on, annotations are scaled. An annotation is an annotation-able element that is placed with the annotation scale lock on. Annotation-able element types are dimensions, text elements, text nodes, notes, detailing symbols, annotation cells, tags, and linestyles.</p> <p>If off, size of annotations remains unchanged (We do not use Scale Annotations at MoDOT).</p>

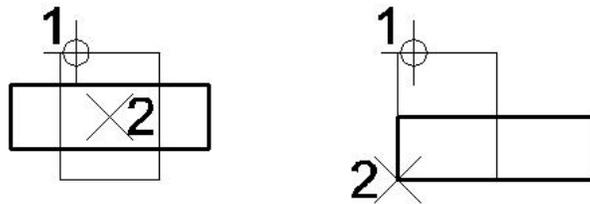
## MicroStation V8i – Manipulate Elements

### To scale an element(s) by the active scale factors

- 1) Select or fence the element(s).
- 2) Select the *Scale* tool.
- 3) In the tool settings window, set Method to Active Scale.
- 4) Enter a data point to define the point about which the element(s) are scaled.

### Alternative Method — To scale an element(s) by the active scale factors

- 1) Select the *Scale* tool.
- 2) In the tool settings window, set Method to Active Scale.
- 3) Identify the element.
- 4) Enter a data point to define the point about which the element(s) are scaled.



*Scale, with Method set to Active Scale. Illustrations show X Scale = 2.0, Y Scale = 0.5, and Make Copy on.*

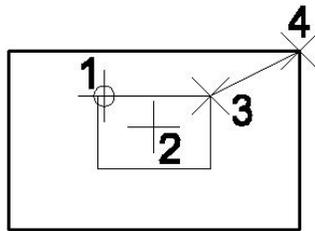
### To scale an element(s) graphically

- 1) Select or fence the element(s).
- 2) Select the *Scale* tool.
- 3) In the tool settings window, set Method to 3 points.
- 4) Enter a data point to define the point to scale about.
- 5) Enter a data point to define a known location or keypoint.
- 6) Enter a data point to define scaling factors.

## MicroStation V8i – Manipulate Elements

### Alternative Method — To scale an element(s) graphically

- 1) Select the *Scale* tool.
- 2) In the tool settings window, set Method to 3 points.
- 3) Identify the element.
- 4) Enter a data point to define the point to scale about.
- 5) Enter a data point to define a known location or keypoint.
- 6) Enter a data point to define scaling factors.



*Scale, with Method set to 3 points.*

### To scale elements, in a fence, about their centers (by a scale factor)

- 1) Use the Place Fence tool to place a fence around the elements.
- 2) Select the *Scale* tool.  
The Scale settings window opens.
- 3) Set Method to Active Scale and set the scale factor.
- 4) Turn on About Element Center (in the Extended Information section of the tool settings).
- 5) Enter a data point to accept the scaled elements.

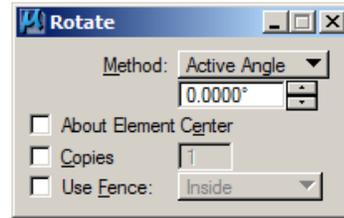


*Left: Selecting the elements to scale with a fence.*

*Right: After scaling the elements with About Element Center turned on (originals shown dashed).*

Choosing Scale from the Reset pop-up menu selects the *Scale* tool. When the tool is selected in this manner, the scale operation affects all selected elements.

## 7.5 Rotate



Used to rotate an element(s). Elements can be rotated individually, as a selected group, or within a fence. When About Element Center is turned on, selected elements are rotated about their (individual) center points.

Tool Settings	Effect
Method	<p>Sets the method used to rotate an element.</p> <ul style="list-style-type: none"> <li>Active Angle — The element(s) are rotated by the Active Angle, which can be keyed in.</li> <li>2 Points — The angle of rotation is defined by entering two data points.</li> <li>3 points — The angle of rotation is defined by three data points.</li> </ul>
About Element Center	<p>If on, in Extended Information section of tool settings, the selected element(s) is rotated about its center point instead of a selected point. Cells and text elements are rotated about their origins.</p> <p>Elements may be selected individually, or you can select multiple elements to rotate in a selection set or using a fence. Where multiple elements are selected they all will be rotated about their own center points.</p>
Copies	<p>If on, the element(s) are copied and the copy(s) are rotated; the original(s) are not manipulated. The adjacent field sets the number of rotated copies to create.</p>
Use Fence	<p>If on, the fence contents are rotated. The option menu sets the Fence (Selection) Mode.</p>

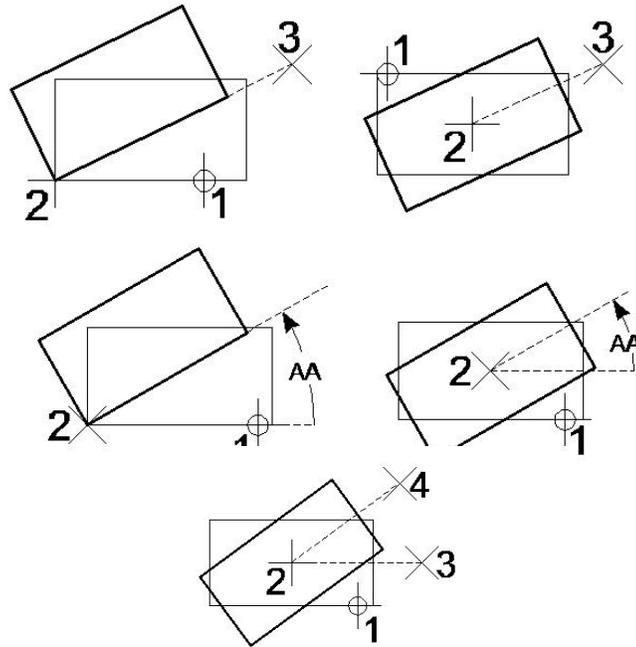
### To rotate an element(s)

- 1) Select or fence the element(s).
- 2) Select the *Rotate* tool.
- 3) Enter a data point to define the pivot point.  
If Method is set to Active Angle, the element(s) are rotated by the Active Angle; repeat to rotate the element(s) again. Otherwise, continue with step 4.
- 4) If Method is set to 2 Points, enter a data point to define the angle of rotation graphically.  
or  
If Method is set to 3 points, enter a data point to define the start of rotation.  
If Method is set to 2 Points, the element(s) are rotated; repeat to rotate the element(s) again. Otherwise, continue with step 5.
- 5) Enter a data point to define the angle of rotation graphically.

## MicroStation V8i – Manipulate Elements

### Alternative Method – To rotate an element(s)

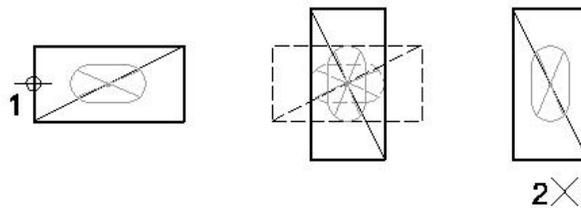
- 1) Select the *Rotate* tool.
- 2) Identify the element.
- 3) Follow steps 3–5 above.



*Rotate tool. Top: with Method set to 2 Points. Middle: with Method set to Active Angle and Active Angle set to 30°. Bottom: with Method set to 3 points.*

### To rotate an element by the Active Angle about its center

- 1) Select the *Rotate* tool.
- 2) Set Method to Active Angle and set the required angle.
- 3) Turn on About Element Center (in the Extended Information section of the tool settings).
- 4) Identify the element to be rotated.  
The rotation is displayed dynamically.
- 5) Accept to complete the rotation.



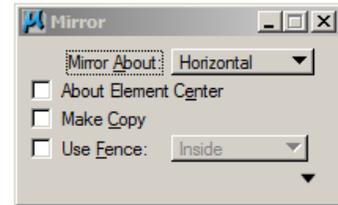
*With Method set to Active Angle and About Element Center turned on:  
Left: Identify the element (1) — a cell in the illustration  
Center: The rotation displays dynamically  
Right: Accept (2) to complete the rotation about the center of the element*

## MicroStation V8i – Manipulate Elements

Choosing Rotate from the Reset pop-up menu selects the *Rotate* tool. When the tool is selected in this manner, the rotate operation affects all selected elements.

If Use Fence is on and the rotation is repeated, any element(s) inside the moved fence are copied along with the original fence contents.

### 7.6 Mirror



Used to mirror an element(s).

Tool Settings	Effect
Mirror About	Sets direction in which element(s) are mirrored: <ul style="list-style-type: none"> <li>• Horizontal — about horizontal axis.</li> <li>• Vertical — about vertical axis.</li> <li>• Line — about line defined by two data points.</li> </ul>
Make Copy	If on, the element(s) are copied and the copy(s) are mirrored; the original(s) are not manipulated.
Mirror Text	If on, text is mirrored.
Mirror Multi-line Offsets	If on, multi-line profile offsets are mirrored.
Use Fence	If on, the fence contents are mirrored. The option menu sets the Fence (Selection) Mode

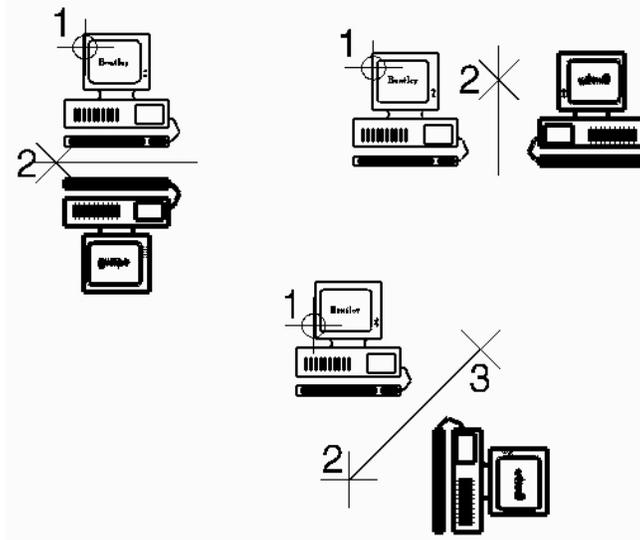
#### To mirror an element(s)

- 1) Select or fence the element(s).
- 2) Select the *Mirror* tool.
- 3) Enter a data point.  
If Mirror About is set to Horizontal or Vertical, the element(s) are mirrored.  
If Mirror About is set to Line, this data point defines one point on the mirroring line.
- 4) If Mirror About is set to Line, enter another data point to define another point on the mirroring line.  
The element(s) are mirrored. You can go back to step 3 to mirror the element(s) again.

## MicroStation V8i – Manipulate Elements

### Alternative Method – To mirror an element(s)

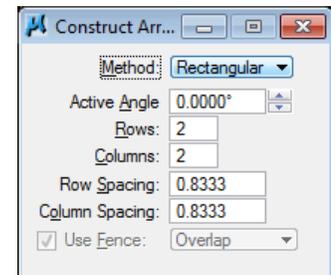
- 1) Select the *Mirror* tool.
- 2) Identify the element.
- 3) Follow steps 3 and 4 above.



*Mirror tool. Clockwise from top left: Mirror About Horizontal, Vertical, and Line. Mirror Text is on.*

Choosing Mirror from the Reset pop-up menu selects the *Mirror* tool. When the tool is selected in this manner, the mirror operation affects all selected elements.

## 7.7 Constructing Arrays



Used to copy an element(s) many times to create an array.

Tool Settings	Effect
Method	Set the type of array that is constructed; different tool settings are available depending on how this is set. Rectangular — Construct a Rectangular array Polar — Construct a Polar (circular) array Along Path — Construct an array along a path element.
Active Angle	(Rectangular array type) Aligns the imaginary orthogonal grid on which the copies are placed.
Rows	(Rectangular array type) The number of rows.

## MicroStation V8i – Manipulate Elements

Columns	(Rectangular array type) The number of columns.
Row Spacing	(Rectangular array type) The space between rows.
Column Spacing	(Rectangular array type) The space between columns.
Items	(Polar array type) Sets the number of items or copies of the fence contents in the array, including the original.
Delta Angle	(Polar array type) Sets the angle between items. If positive, copies are placed counterclockwise. If negative, copies are placed clockwise.
Rotate Items	(Polar array type) If on, the element(s) are rotated about the center of the array. (Along Path array type) If on, the element(s) are rotated to maintain their relative orientation to the path element.
Mode	(Along Path array type) Sets the way that the array is created. Number — Defines the number of items in the array, via the Copies setting. Distance — Defines the distance between items in the array, via the Distance setting. Both — Defines the number of items in the array and the distance between each item, via the Copies and Distance settings respectively.
Use Fence	If on, the fence contents are copied into an array. The option menu sets the Fence (Selection) Mode.

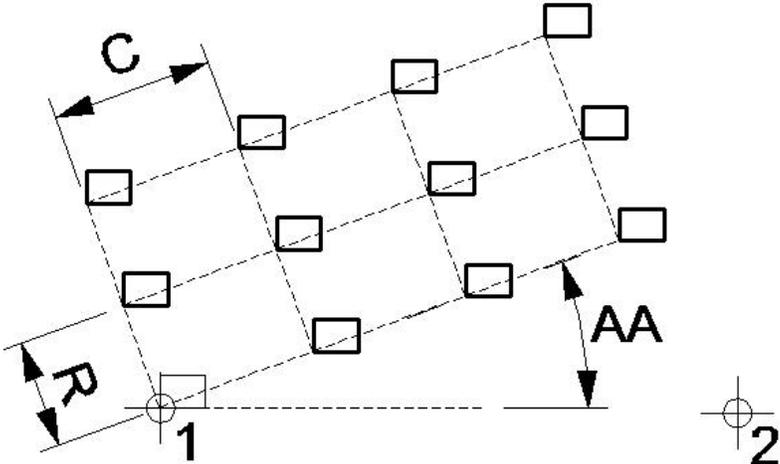
### To create a rectangular array

1. Select or fence the element(s).  
The element(s) become the lower left items of the array.
2. Select the *Construct Array* tool.
3. In the tool settings window, set Array Type to Rectangular.
4. (Optional) As needed, adjust other settings.
5. Accept the array.

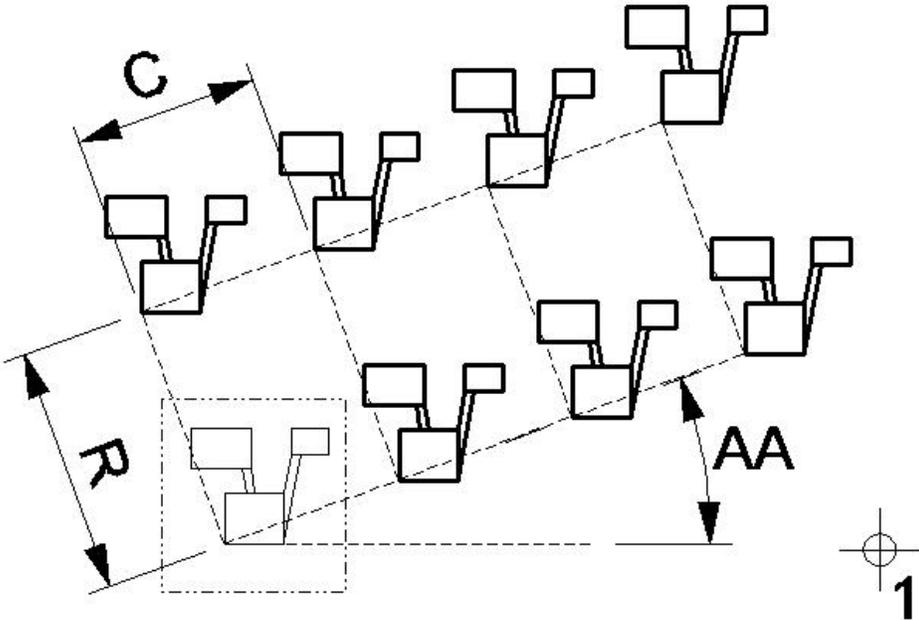
# MicroStation V8i – Manipulate Elements

## Alternative Method – To create a rectangular array

- 1. Select the *Construct Array* tool.
- 2. In the tool settings window, set Array Type to Rectangular.
- 3. Identify the element.  
The element becomes the lower left element of the array.
- 4. Follow steps 4–5 above.



Constructing a rectangular array from an element: Identify the element (1) and accept (2). “C” denotes the column spacing, “R” the row spacing, and “AA” the active angle.



Constructing a rectangular array of fence contents (with Use Fence turned on): Accept the fence contents (1). “C” denotes the column spacing, “R” the row spacing, and “AA” the active angle.

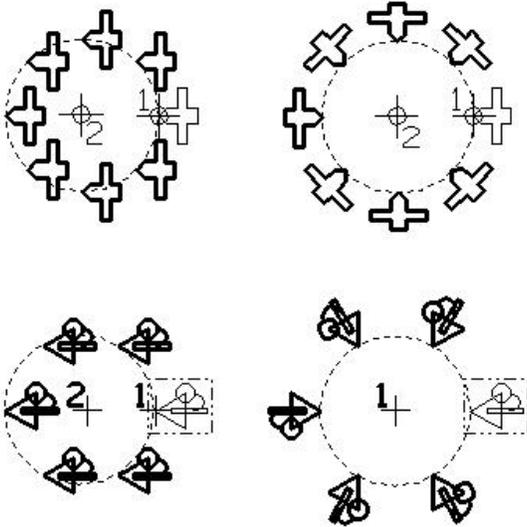
# MicroStation V8i – Manipulate Elements

## To create a polar array

1. Select or fence the element(s).
2. Select the *Construct Array* tool.
3. In the Tool Settings window, set Array Type to Polar.
4. Enter a data point to define the array's center.

## Alternative Method — To create a polar array

1. Select the *Construct Array* tool.
2. In the Tool Settings window, set Array Type to Polar.
3. Identify the element to copy.
4. Enter a data point to define the array's center.  
The point at which the element is identified (step 3) is positioned in each copy on an imaginary circle.

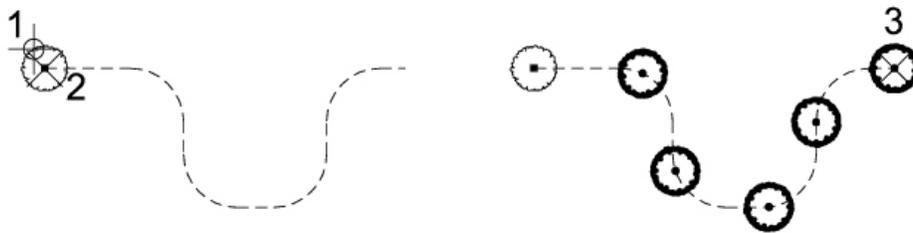


Constructing a polar array. Top: Identifying an element. Number of Items is 8 and Delta Angle is 45°. Bottom: Copying fence contents (Use Fence on). Number of Items is 6 and Delta Angle is 60°.

## MicroStation V8i – Manipulate Elements

### To create an array along a path

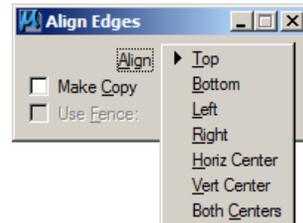
1. Select the *Construct Array* tool.
2. In the Tool Settings window, set Array Type to Along Path.
3. Adjust other settings as required.
4. Identify the element to copy, at the point to use as the array reference.
5. Identify the path element at the start point for the array.
6. Accept at the required end point along the path element.  
The array is constructed along the path, between the defined points.



*Left: Identify the element to array (1), and the start point for the path element (2).*

*Right: Accept at the required end point along the path element (3).*

## 7.8 Align Edges



Used to align an element(s) to an edge of another element.

Tool Settings	Effect
Align	Sets the manner by which to align: <ul style="list-style-type: none"> <li>• Top</li> <li>• Bottom</li> <li>• Left</li> <li>• Right</li> <li>• Horiz(ontal) Center</li> <li>• Vert(ical) Center</li> <li>• Both Centers</li> </ul>
Make Copy	If on, the element(s) are copied and the copy(s) are aligned to the identified base element; the original(s) are not manipulated.
Use Fence	If on, the fence contents are aligned. The option menu sets the Fence (Selection) Mode

## MicroStation V8i – Manipulate Elements

### To align elements to another element

- 1) Select or fence the elements to align.
- 2) Select the *Align Edges* tool.
- 3) Identify the base element to which to align the selected elements.  
The selected elements are aligned to the edge of the base element.
- 4) Accept the alignment to the base element.

### Alternative Method – To align elements to another element

- 1) Select the *Align Edges* tool.
- 2) Identify the base element to which to align other elements.  
The base element highlights, and a range block is displayed normal to the view.
- 3) Identify an element to align.  
The identified element is aligned to the edge of the base element, which remains highlighted with the range block.
- 4) Continue identifying elements until all of the desired elements are aligned to the base element.
- 5) Accept the last element's alignment to the base element.  
The base element remains highlighted with the range block.
- 6) Reset.

## 7.9 Stretch Element



Used to stretch fence contents, which are defined by a fence. The fence can be an existing fence, or you can define a new rectangular (only) fence with this tool.

The *Stretch Element* tool operates on elements as follows:

- A vertex of a line, line string, multi-line, or shape is moved if it is inside the fence. A vertex outside the fence is not moved.
- An endpoint of an arc is moved if it is inside the fence. An arc endpoint outside the fence is not moved.
- An ellipse, circle, or cell is moved if it is completely inside the fence.
- One or more poles (control points) of a B-spline surface, that are located inside the fence, are moved

You can use the *Stretch Element* tool to manipulate breaks (such as breaks in multi-lines, which are often used to represent windows or doorways when the multi-line itself is the wall). For instance, you can place your fence to include a window, and move the window along the wall. You may also change the size of the window by including only the start or end of the break in the fence. This means that in most cases, you do not have to drop the multi-line into its component elements to perform such manipulations.

## MicroStation V8i – Manipulate Elements

You cannot move the break off the multi-line segment that contains it. If you move the fence so the start or endpoint of a break would move off the segment, the break position will simply be projected to the nearest point on the segment. If you move a break off the end of the segment, it will simply be deleted.

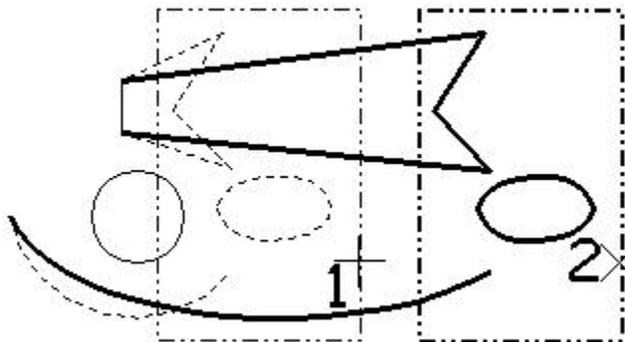
Tool Settings	Effect
Use Fence	(Fence present only) If on, the current active fence is used.
Stretch Cells	If on, cells that overlap the fence are stretched.

### To stretch segments of elements that overlap a fence

1. Select the *Stretch Element* tool.
2. Enter a data point to define one corner of the fence.
3. Enter a data point to define the diagonally opposite corner of the fence.
4. Enter a data point to define the origin point.
5. Enter a data point to reposition the fence and the affected elements and/or vertices.

### To stretch segments of elements that overlap an existing fence

1. Use the *Place Fence* tool to place a fence around the segments that you wish to stretch.
2. Select the *Stretch Element* tool.
3. Turn on Use Fence.
4. Enter a data point to define the origin point.
5. Enter a data point to reposition the fence and the affected elements and/or vertices.



*Stretching elements that overlap an existing fence.*