MicroStation - Measuring Horizontal Distances in 3D Files

Overview

Measuring distances in a 3D MicroStation file can produce varied results depending on which method you use and options selected for that method. This tech note describes two InRoads methods, a MicroStation method, and a WSDOT utility, for measuring horizontal distances in a 3D MicroStation file. Experience and familiarity will help the user to choose the method that best suits their needs.

Note that measuring horizontal distances in 2D files can be done by any method because the elevation information is ignored.

Summary of Approaches

METHOD 1 - Measuring Distances with InRoads

To measure the horizontal or planar distance between two elements in MicroStation, you can use the InRoads **Inverse** command (*Geometry* > *Utilities* > *Inverse Direction*).

There is no dialog box for this command; simply follow the directions in the prompt field and snap to the desired endpoints and you will get a report as follows:

> Inverse Direction
>
> 1000.00 1000.00 0.00
>
> N 45^00'00" E 14.14
>
> 1010.00 1010.00 150.00

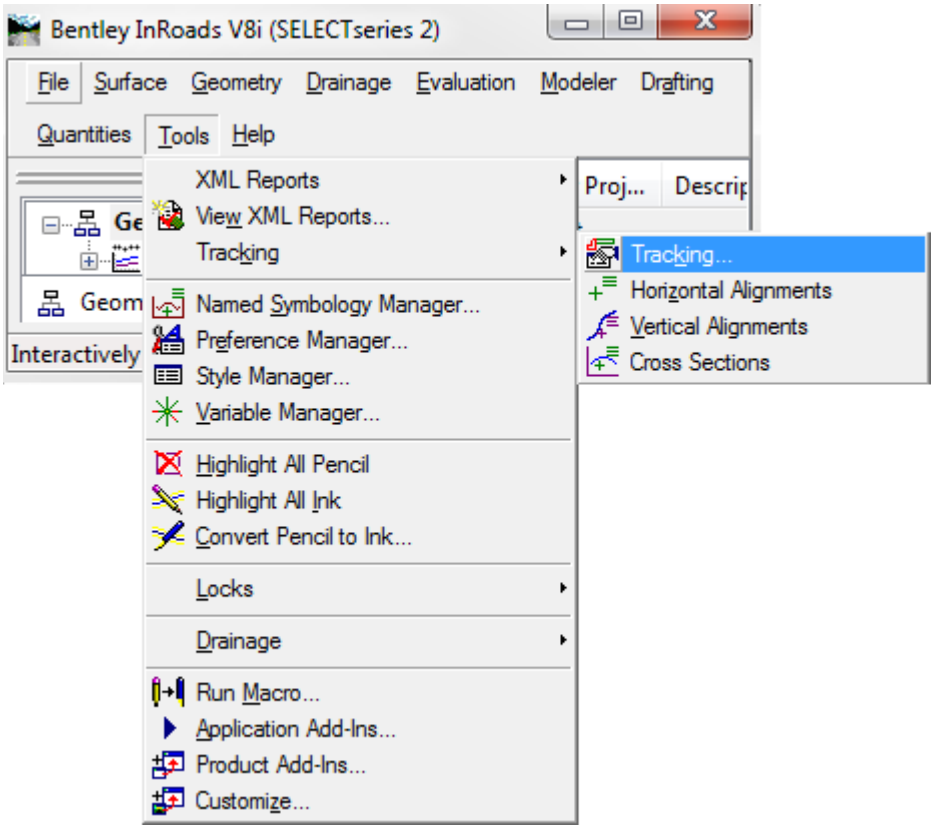
This report was generated by inversing between two points; one at 1000.0,1000.0,0.00 (x,y,z) and the other at 1010.0,1010.0,1050.0 (x,y,z). The Inverse Direction returns a value of 14.14 feet, the planar distance.

Method 1 Considerations:

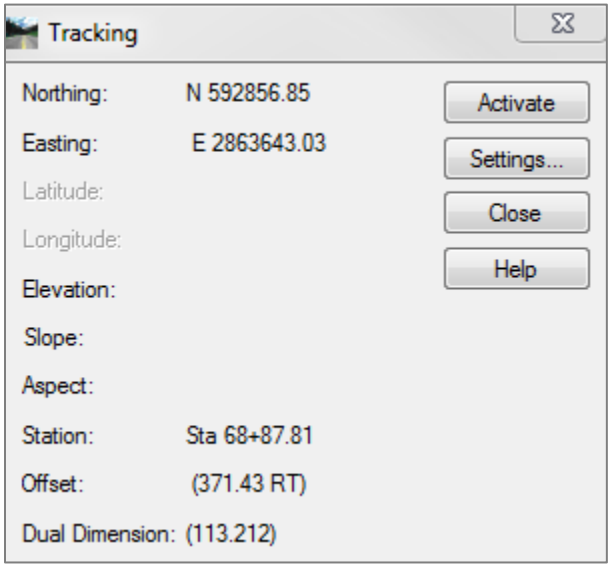
- The report lock must be on to generate the data in report format.
- The write lock must be off or else InRoads will place graphics between the two inverse points depending on the settings of the active preference.
- If you are inversing between two InRoads stored points, be sure to have the point lock turned on.

Method 2 - InRoads Tracking

To retrieve an offset measurement from an InRoads active alignment, use the **Tracking** tool (*Tools* > *Tracking* > *Tracking*).



This opens the Tracking Dialog box which gives you check box options for a Station and Offset measurement along with other information about your end point. Tentative snap on the point you wish to measure and read the results returned by the tool.



METHOD 3 - Measuring Distances in MicroStation (3D file)

To measure the horizontal or planar distance in MicroStation while in a top view, make sure the **Depth Lock** (*Settings* > *Locks* > *Depth*) is turned on. This does not change the actual elevation values, but each

selected point is projected to the active depth and then measured on that plane. If the depth lock is not toggled on you are actually measuring the slope distance of the points.

1. Select the **Measure Distance** tool and choose the appropriate distance option (such as *Between Points*).
2. **Data point** or snap to the two points to display the distance measured.

Method 3 Considerations:

The view in which you use the measure tool must be rotated to the *Top* view.

The MicroStation Help documentation defines the **Depth Lock** as:

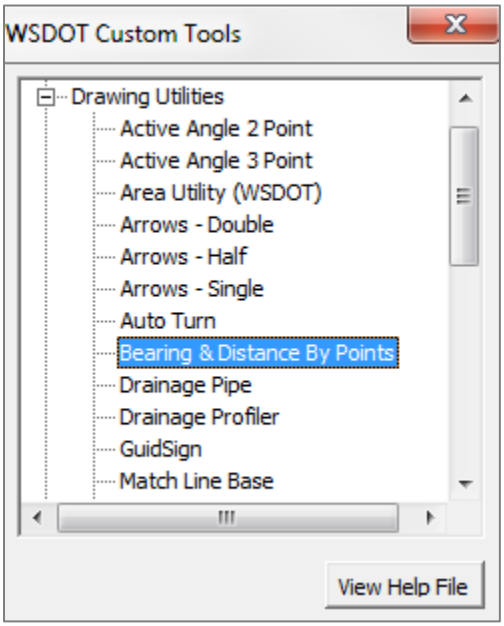
> "(3D only) If on, each tentative point is projected along the view z-axis at the Active Depth.
>
> In rotated views the Active Depth (AZ=) changes as the view is rotated (so results are erratic) but in top view the tentative snap works as expected, it snaps to endpoints."

METHOD 4 - Measuring Distances using WSDOT Tools

Another way to measure the distance between two points is to use the WSDOT **Bearing and Distance by Points** tool.

In MicroStation, click on the WSDOT pull down and select the *WSDOT Tools >Drawing Utilities > Bearing & Distance By Points* command.

This command behaves the same way as MicroStation's **Measure Between Two Points** command with respect to the distance but this command also reports the bearing which is accurate in the top view but becomes unreliable when used in a rotated view with the depth lock on.



For questions or comments on this tech note, contact your regional CAE Support Coordinator or the WSDOT CAE Help Desk at (360) 709-**8013**.