Why You Need Civil AccuDraw

Robert Nice – Bentley Systems

Bentley
Advancing Infrastructure

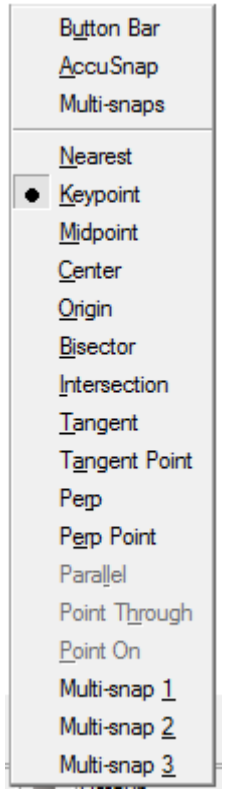
Why You Need Civil AccuDraw

The identifying and placing of points are an intrinsic part of any civil model.

Points make up a part of nearly every geometric construction, like the start and endpoints of both horizontal and vertical lines and arcs. They identify surveyed features, locate drainage structures and delineate the vertices of terrain triangles.

MicroStation offers a variety of standard graphical snapping conventions that are very helpful when it comes to locating or identifying these points.

However, many times we'll find these basic snapping tools are not sufficient for more advanced placements.



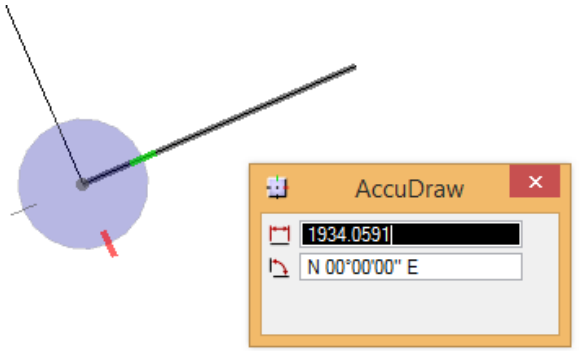
Bentley

What is AccuDraw?

In cases where the standard graphical snapping conventions are not enough, the MicroStation *AccuDraw* tool provides additional capabilities.

AccuDraw allows the user to provide precision input of point parameters (e.g. coordinates, distance, direction, etc.) as well as providing point input based on relationships with other points or geometric entities.

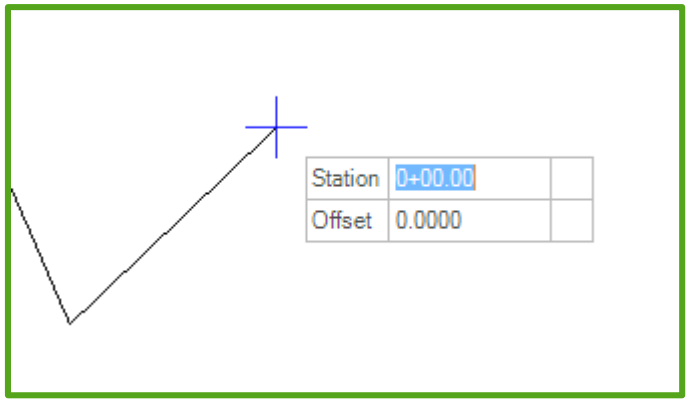
However, as useful as *AccuDraw* is, it has limitations in the civil world. For example, it is not able to recognize civil geometry, thus it's not able to interpret station and offset information from a specified baseline.



Bentley

What is AccuDraw?

Civil Accudraw is designed to replicate those portions of ***Accudraw*** which are relevant to a civil workflow as well as *expand the capabilities to identify and locate points based on civil constraints and input*.

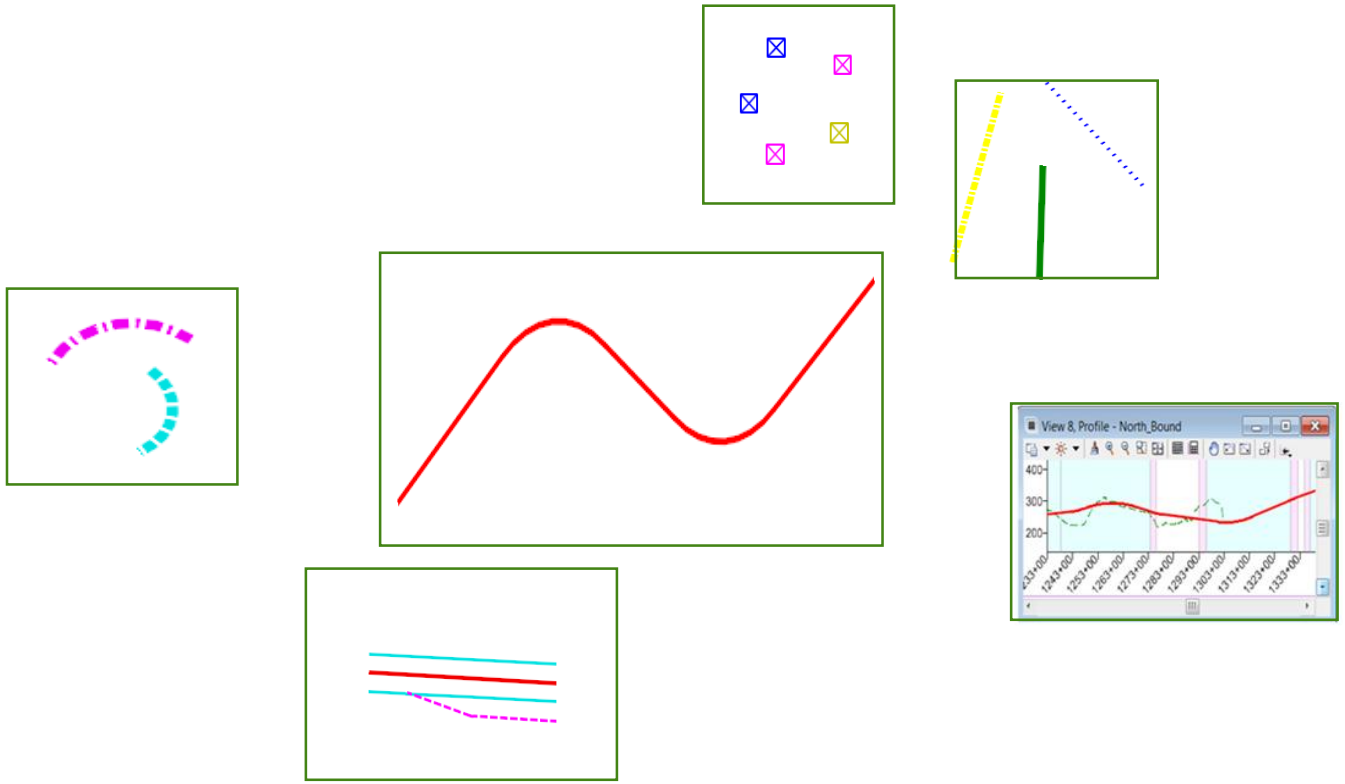


Bentley

What Civil AccuDraw does not do.

It does not create elements.

It is used in the creation of elements, but in and of itself it does not create or draw anything. It just feeds input to other commands which create elements.



Bentley

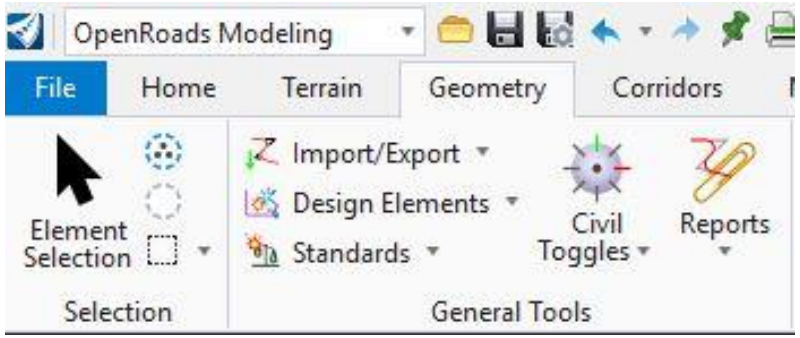
The Basics

- Activating, Controlling and Customizing Civil AccuDraw

Bentley

Activating the Civil AccuDraw toolbar

OpenRoads Modeling : Geometry : General Tools

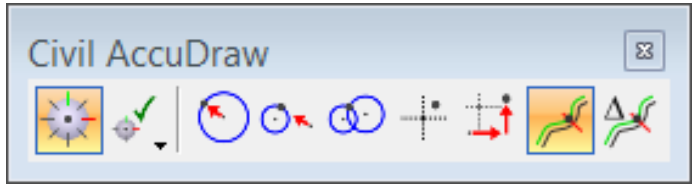


Bentley

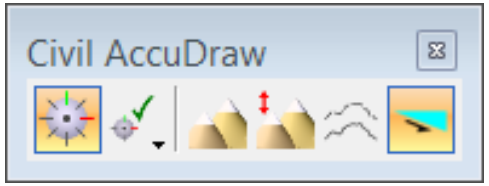
The Civil AccuDraw toolbar

- Can be docked
- Provides access to all Civil AccuDraw functions.
- Changes based on the focused view.

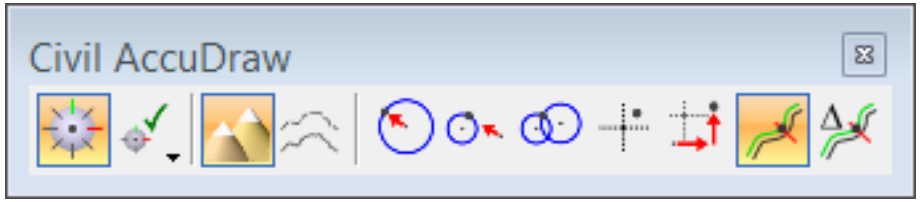
2D Plan



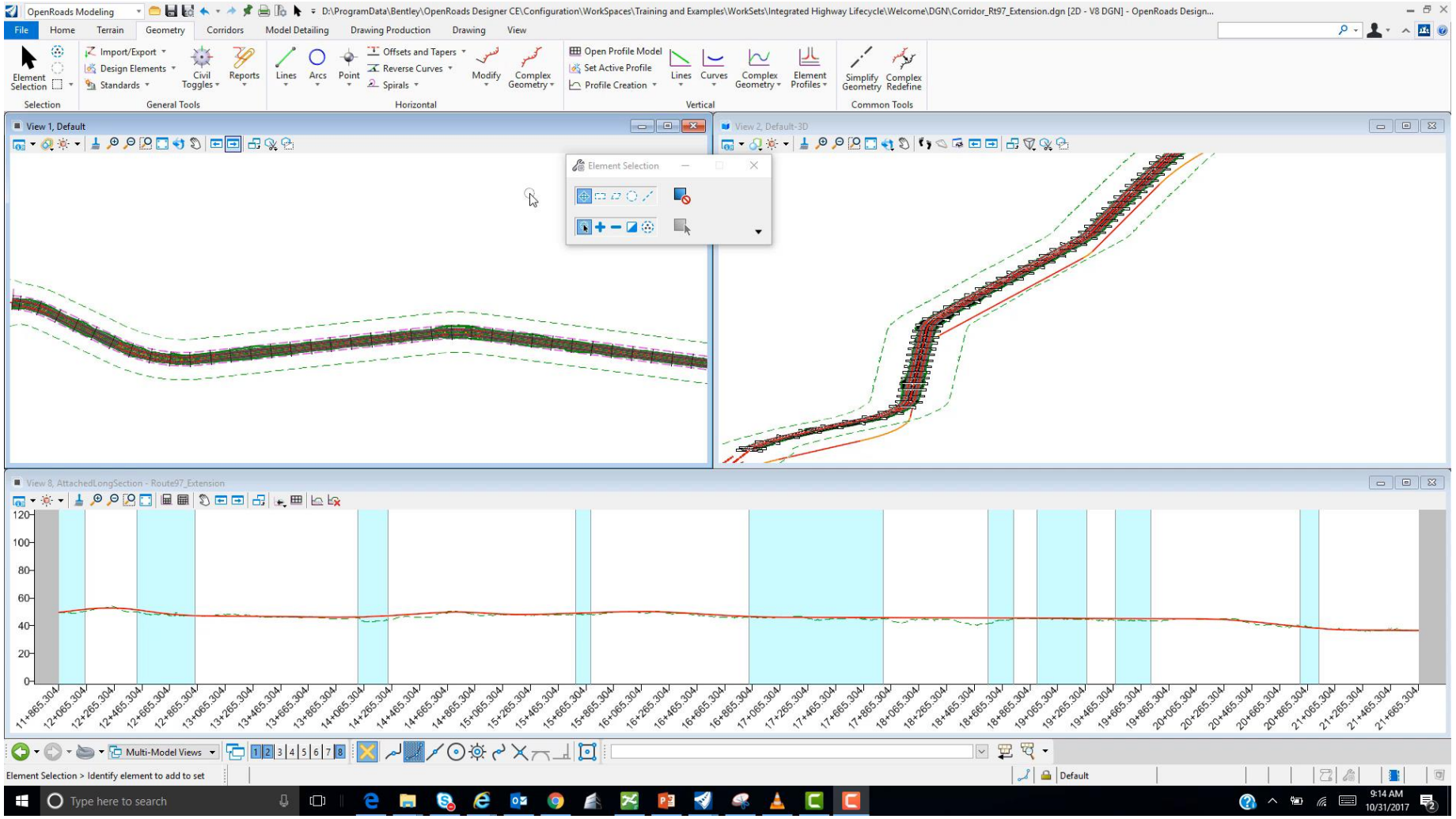
Profile Model View



3D Plan



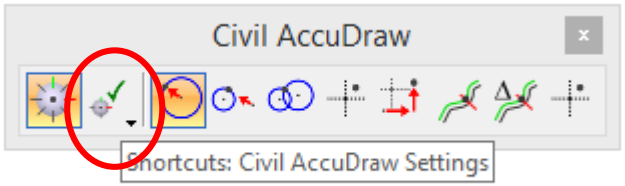
Bentley



Bentley

Settings

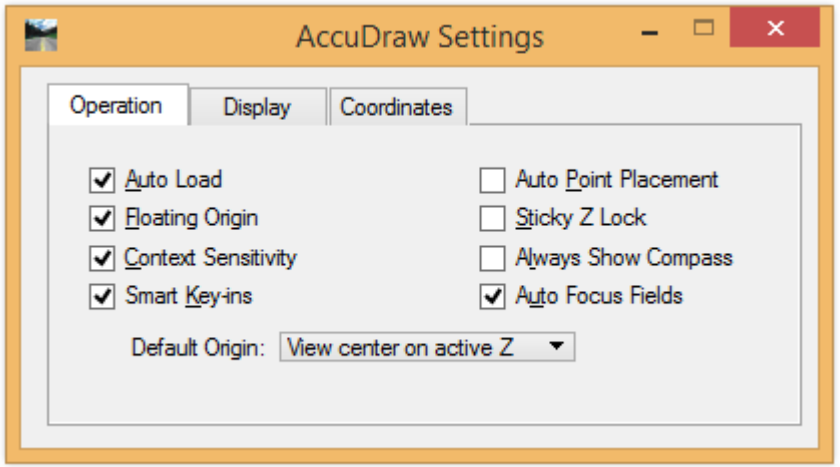
Civil AccuDraw toolbar

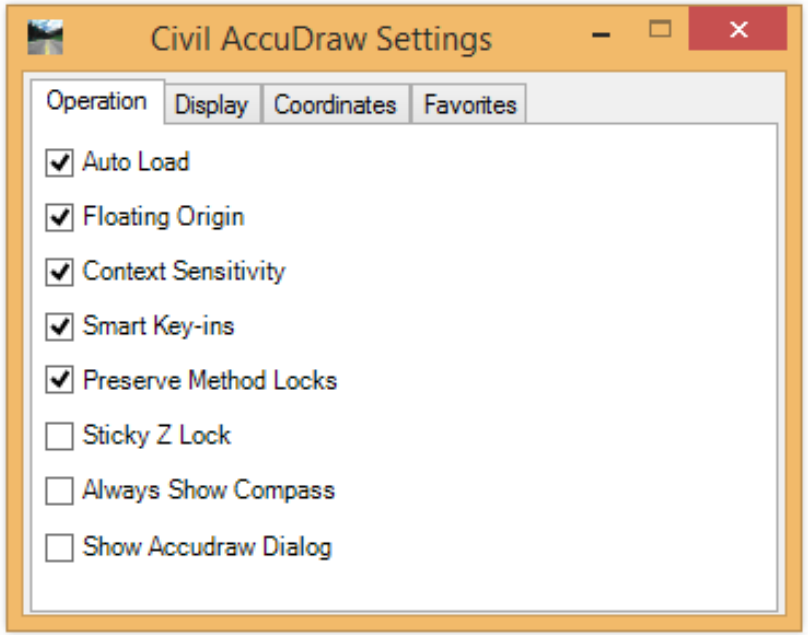


Bentley

Settings are similar to MicroStation AccuDraw

Operation Tab

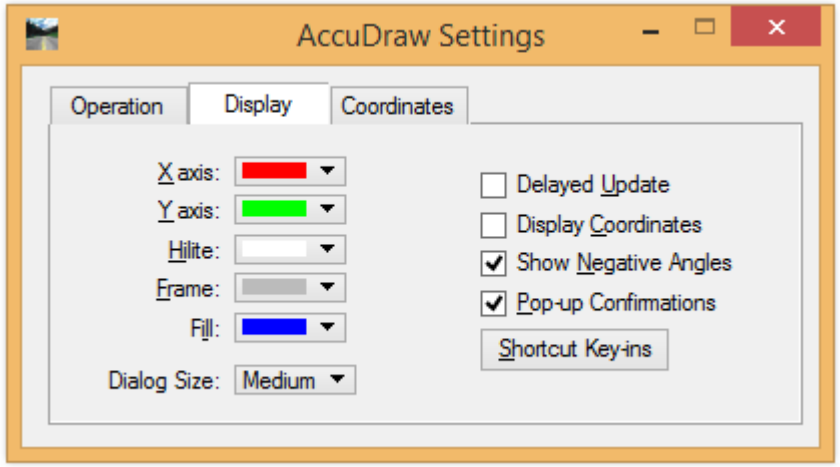


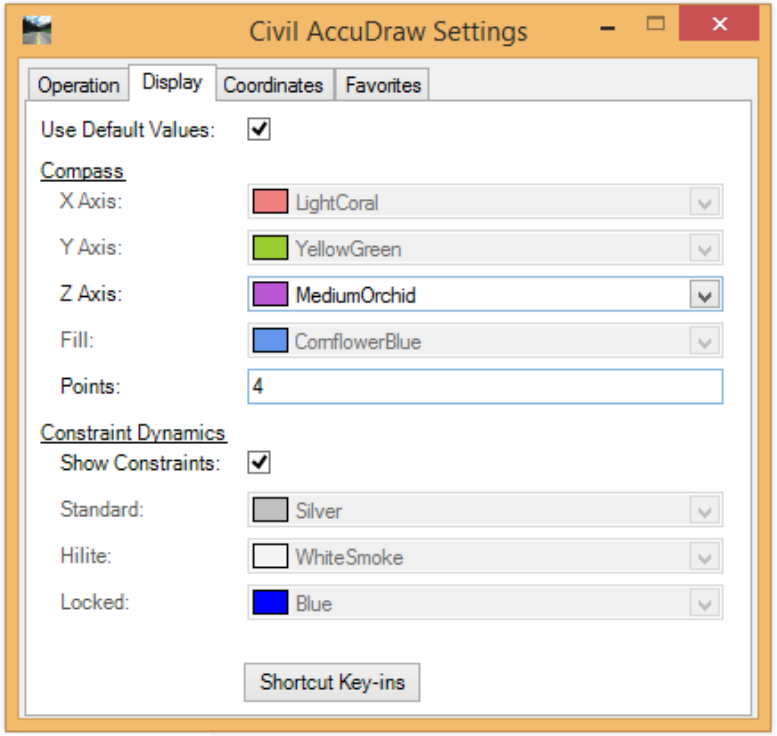


Bentley

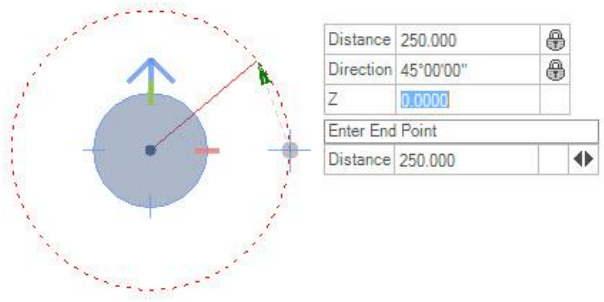
Settings are similar to MicroStation AccuDraw

Display Tab





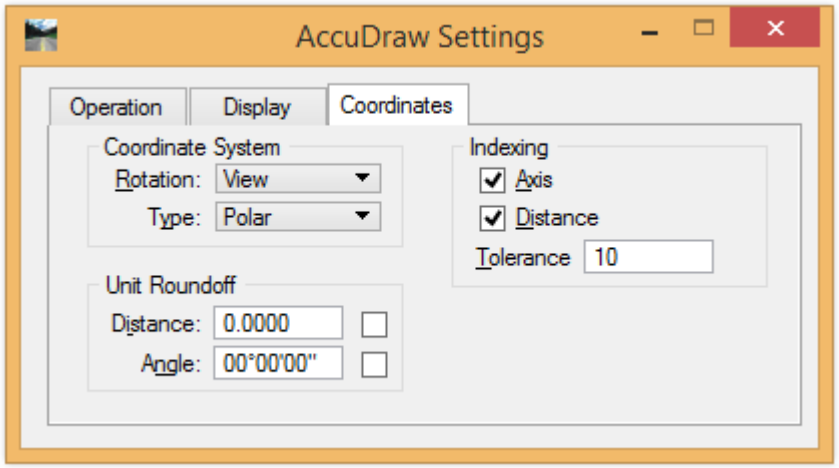
These settings control the heads-up dynamics.

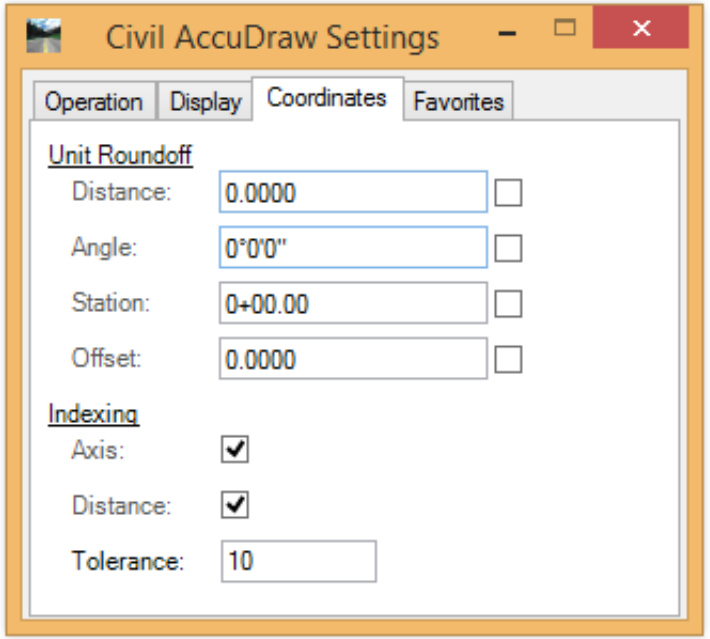


Bentley

Settings are similar to MicroStation AccuDraw

Coordinates Tab

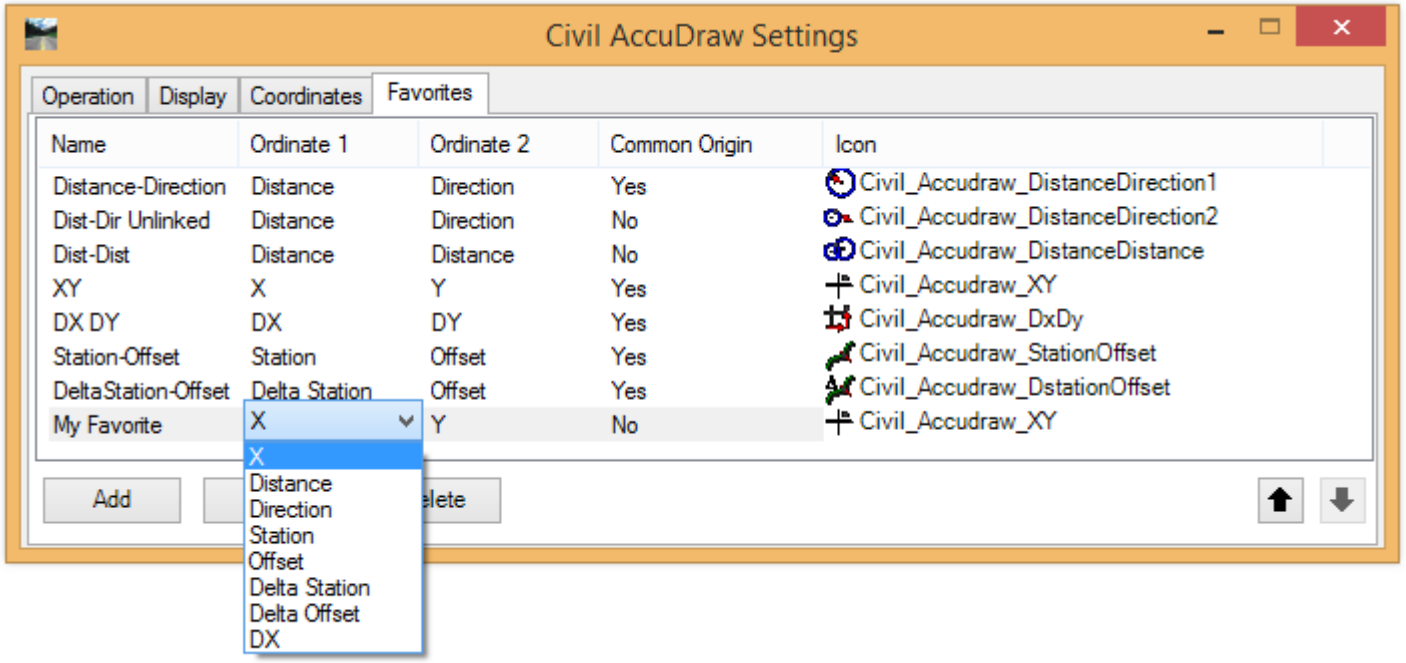




Bentley

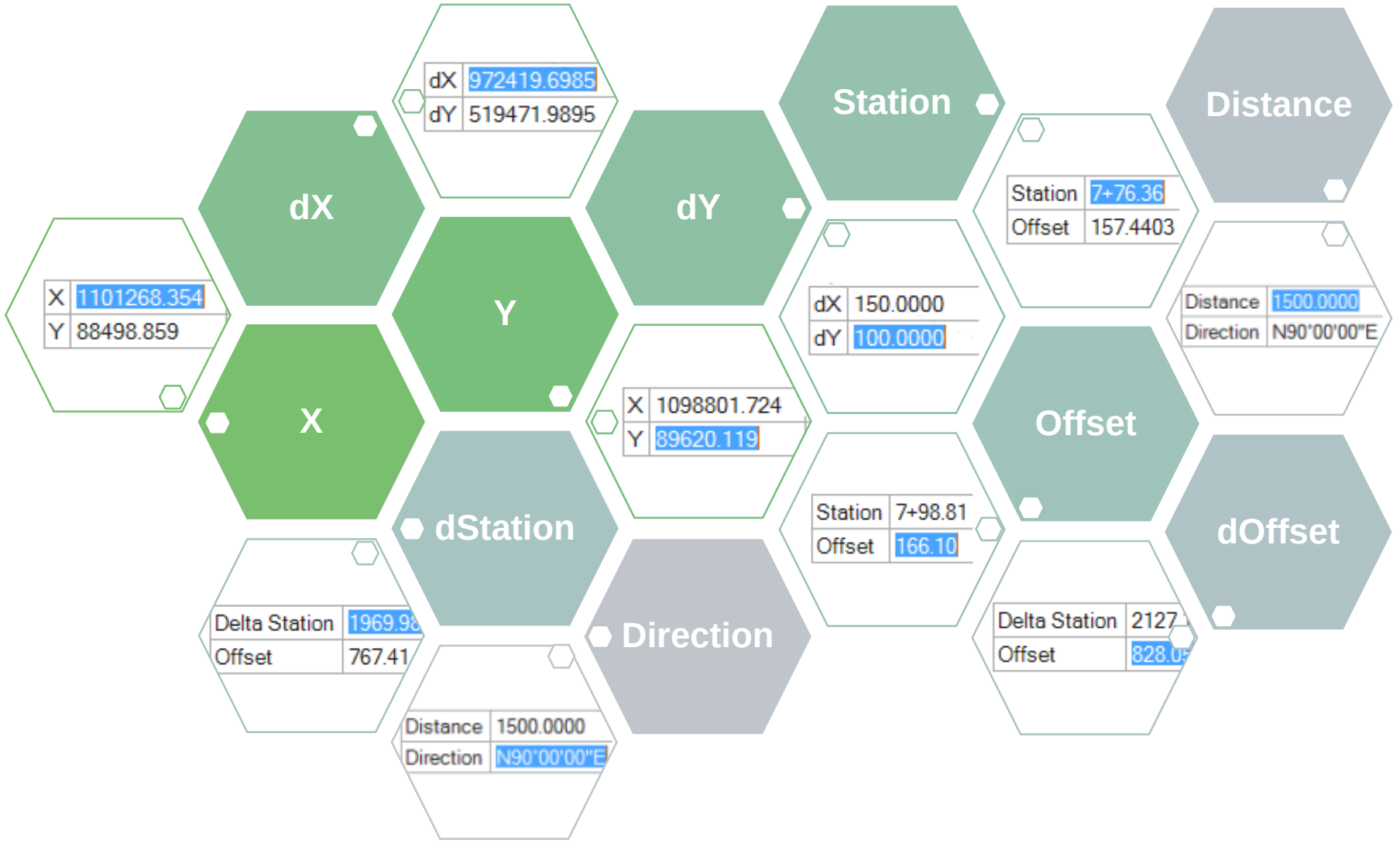
Favorites (Civil AccuDraw only)

Support user-customized methods.



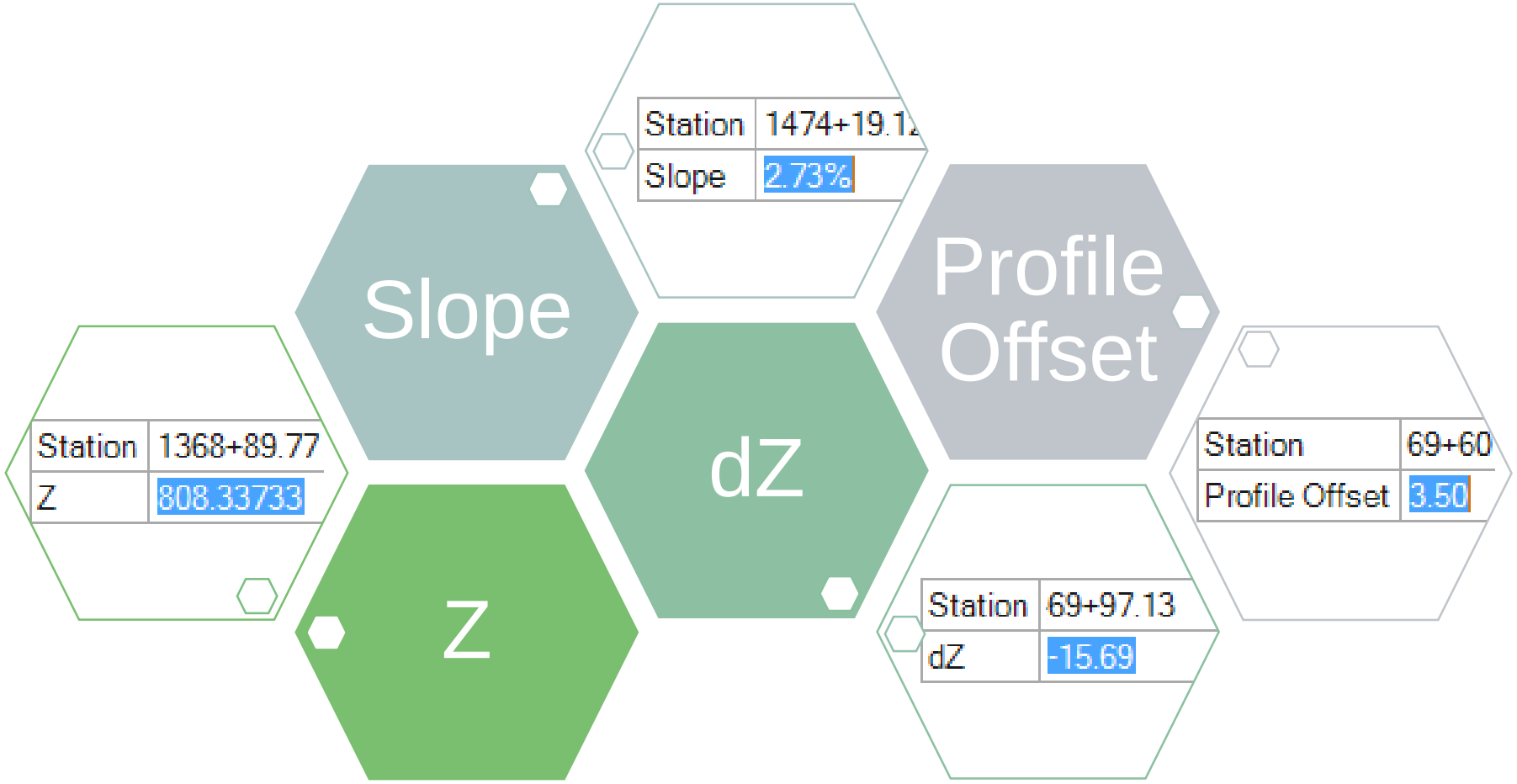
Bentley

Horizontal Methods



Bentley

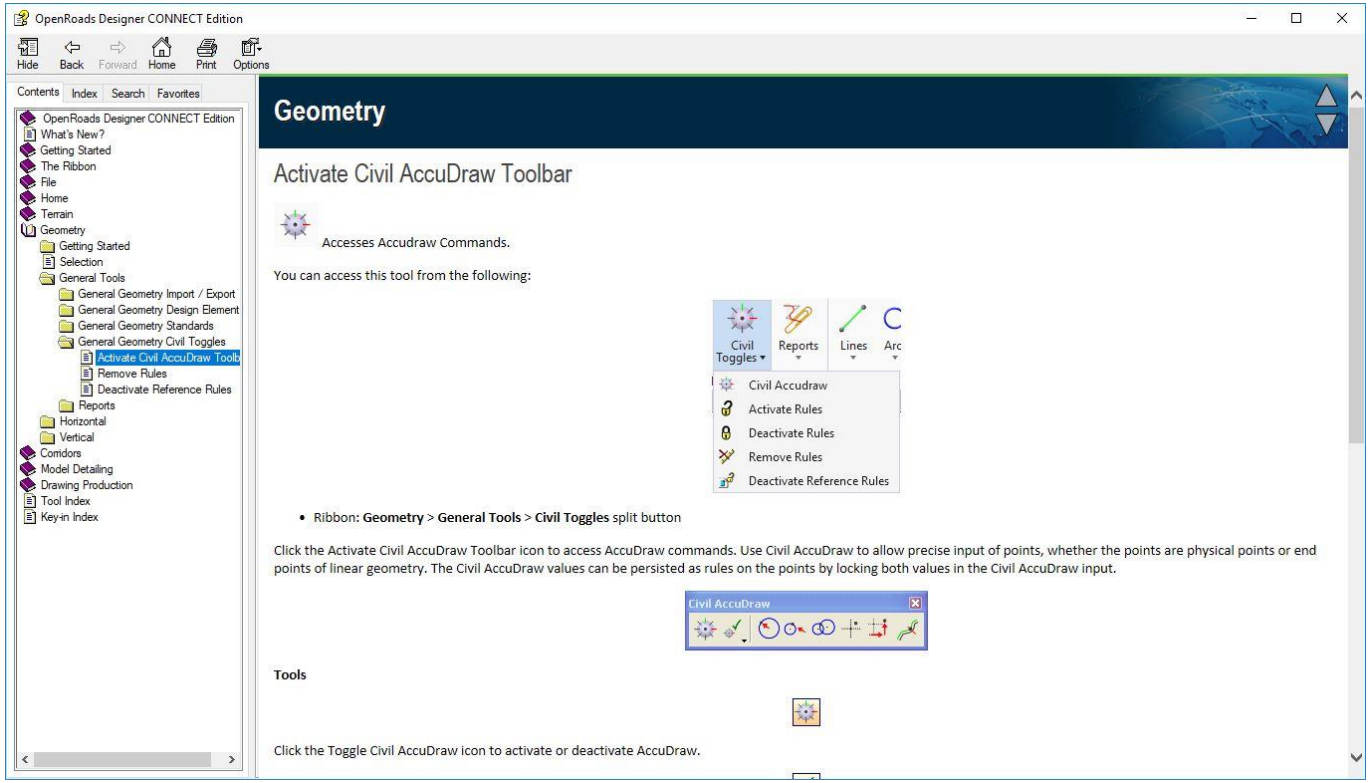
Vertical Methods



Bentley

Help!

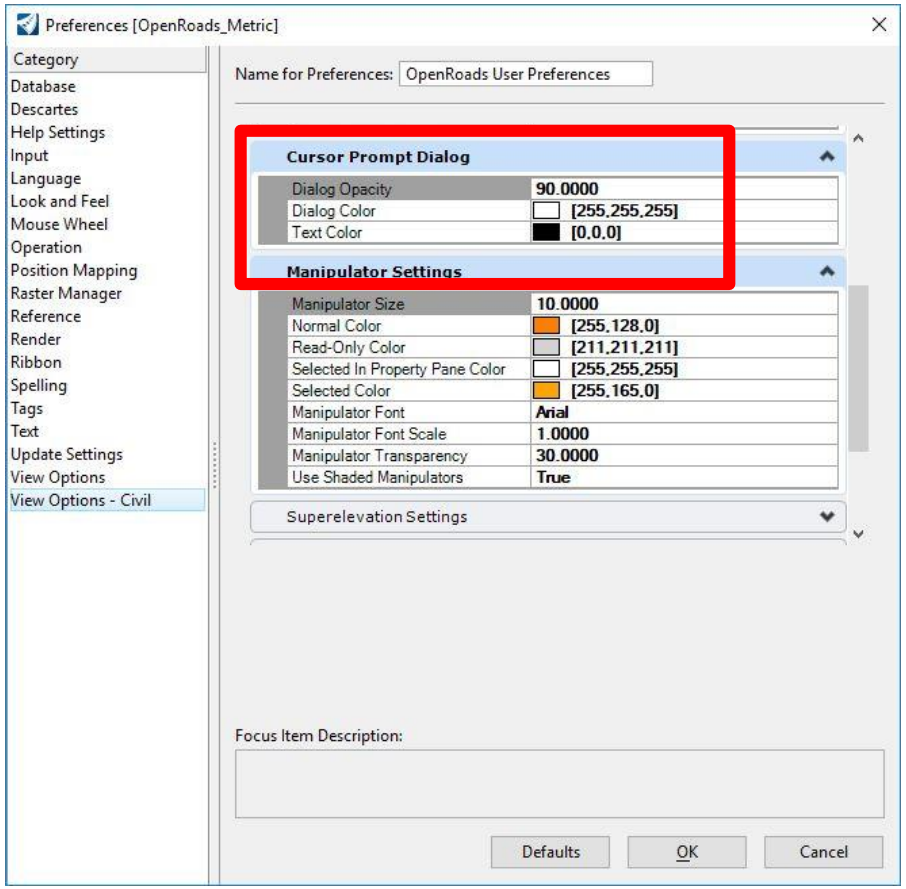
All settings are detailed in the OpenRoads Help.

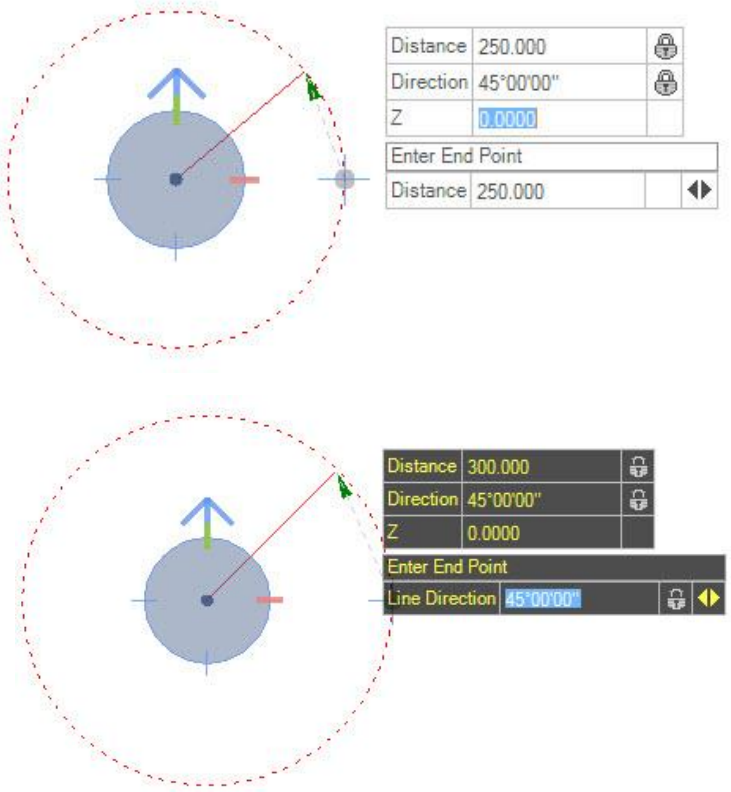


Bentley

File > Settings > User > Preferences > View Options - Civil

Settings to control the look and feel of the Cursor Prompt Dialog.

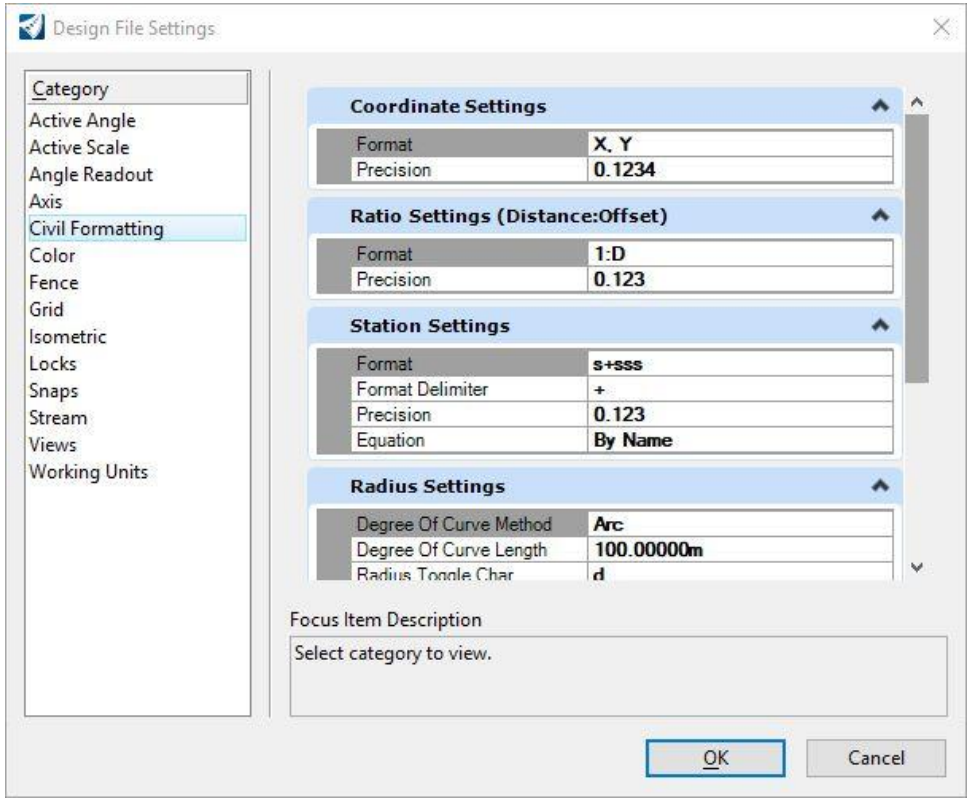




Bentley

File > Settings > File > Design File > Civil Formatting

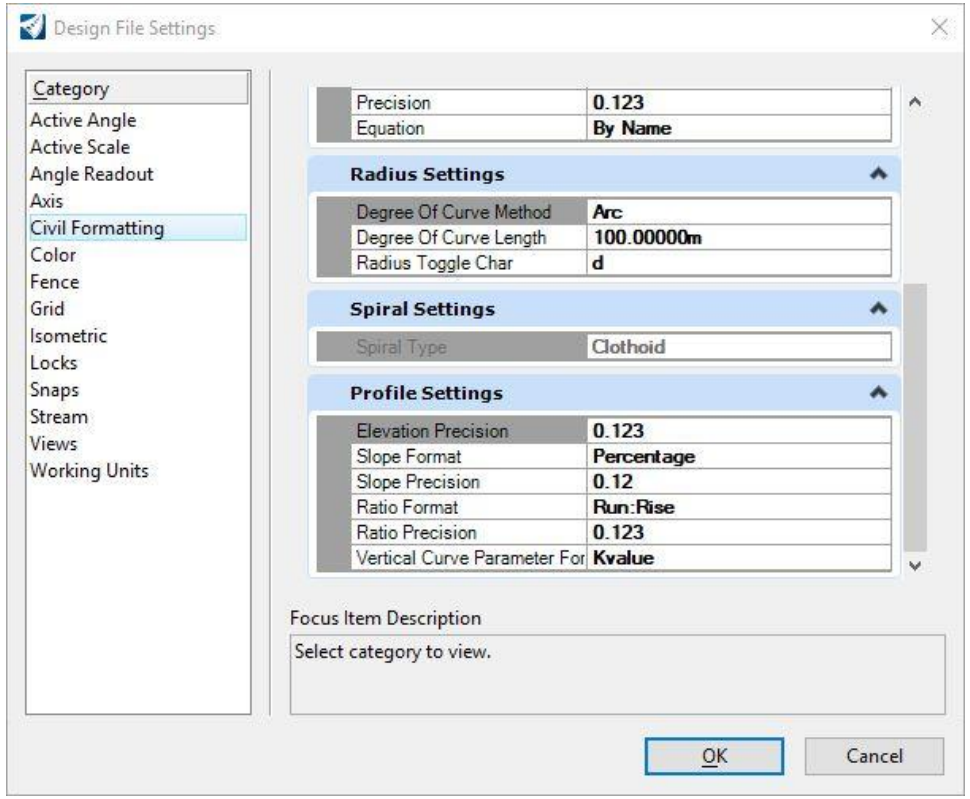
Coordinate Settings



Bentley

Settings > Design File > Civil Settings

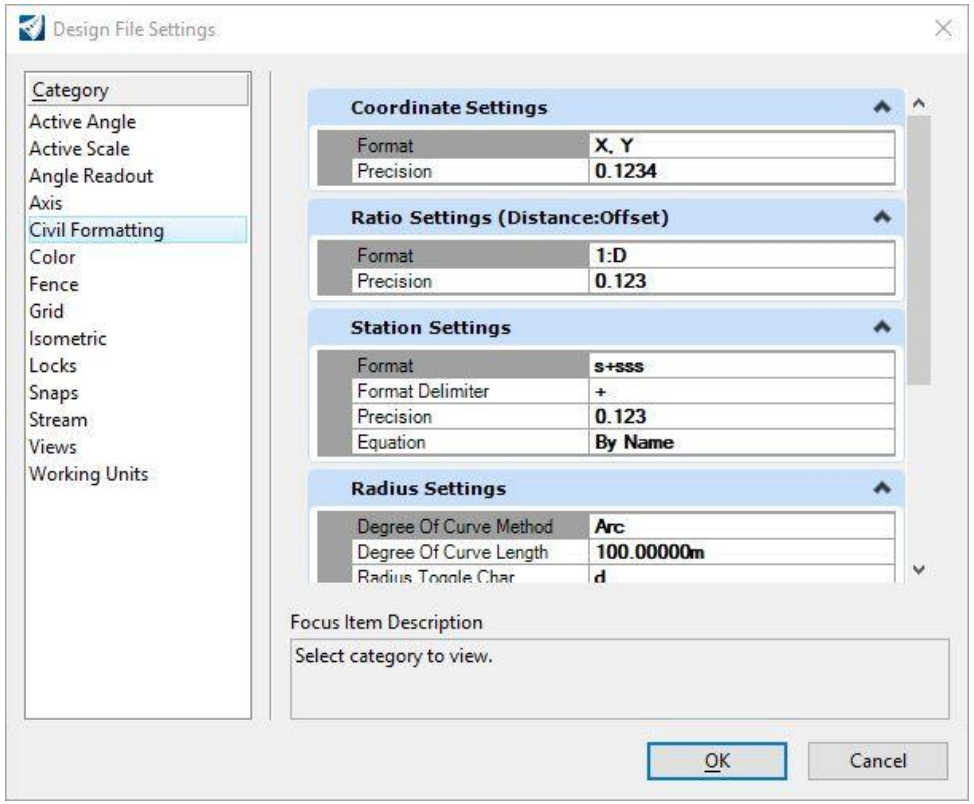
Profile (slope) Settings



Bentley

Settings > Design File > Civil Settings

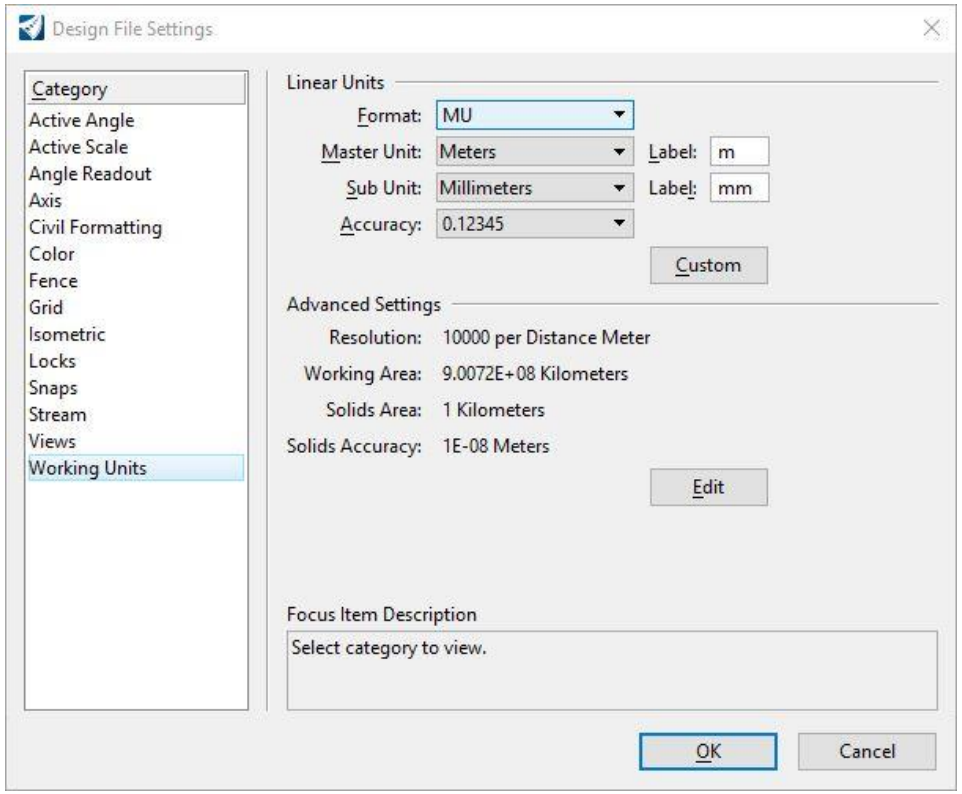
Station Settings



Bentley

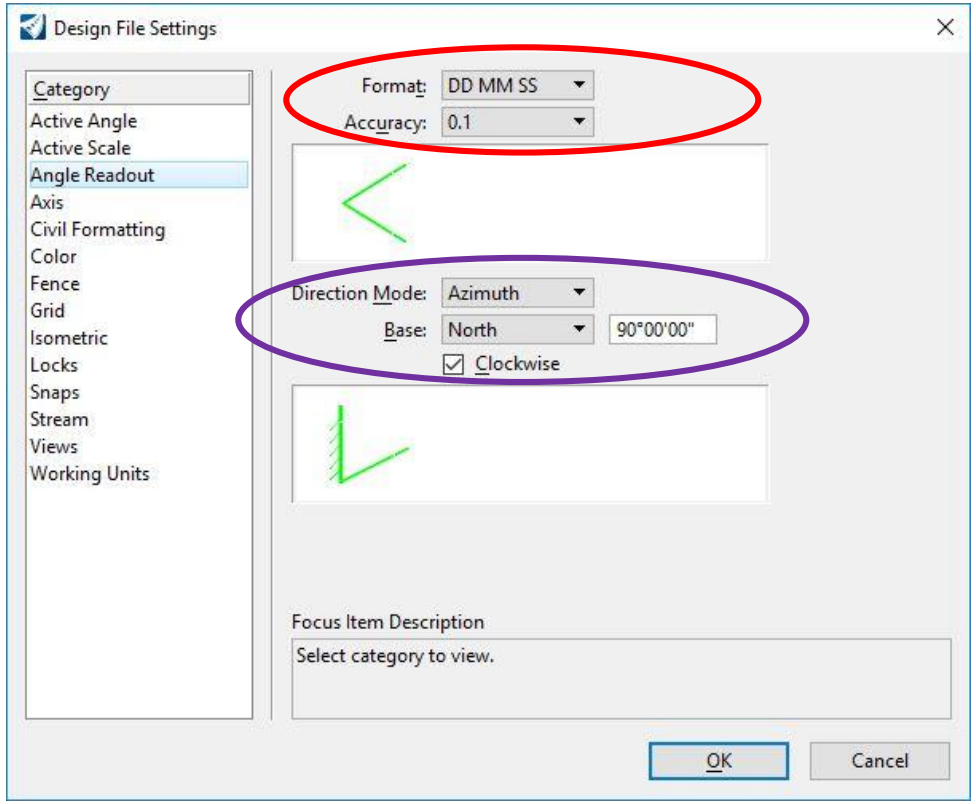
Settings > Design File > Working Units

- **dX, dY, dStation, Length, Profile Offset, etc.**



Bentley

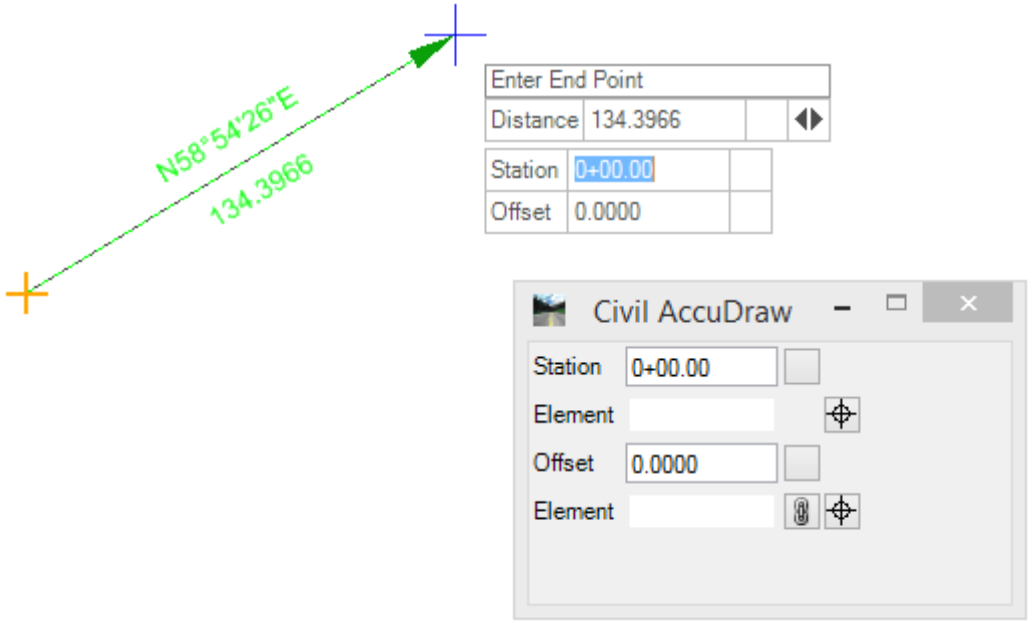
Settings > Design File > Angle Readout



Bentley

Tips and Tricks

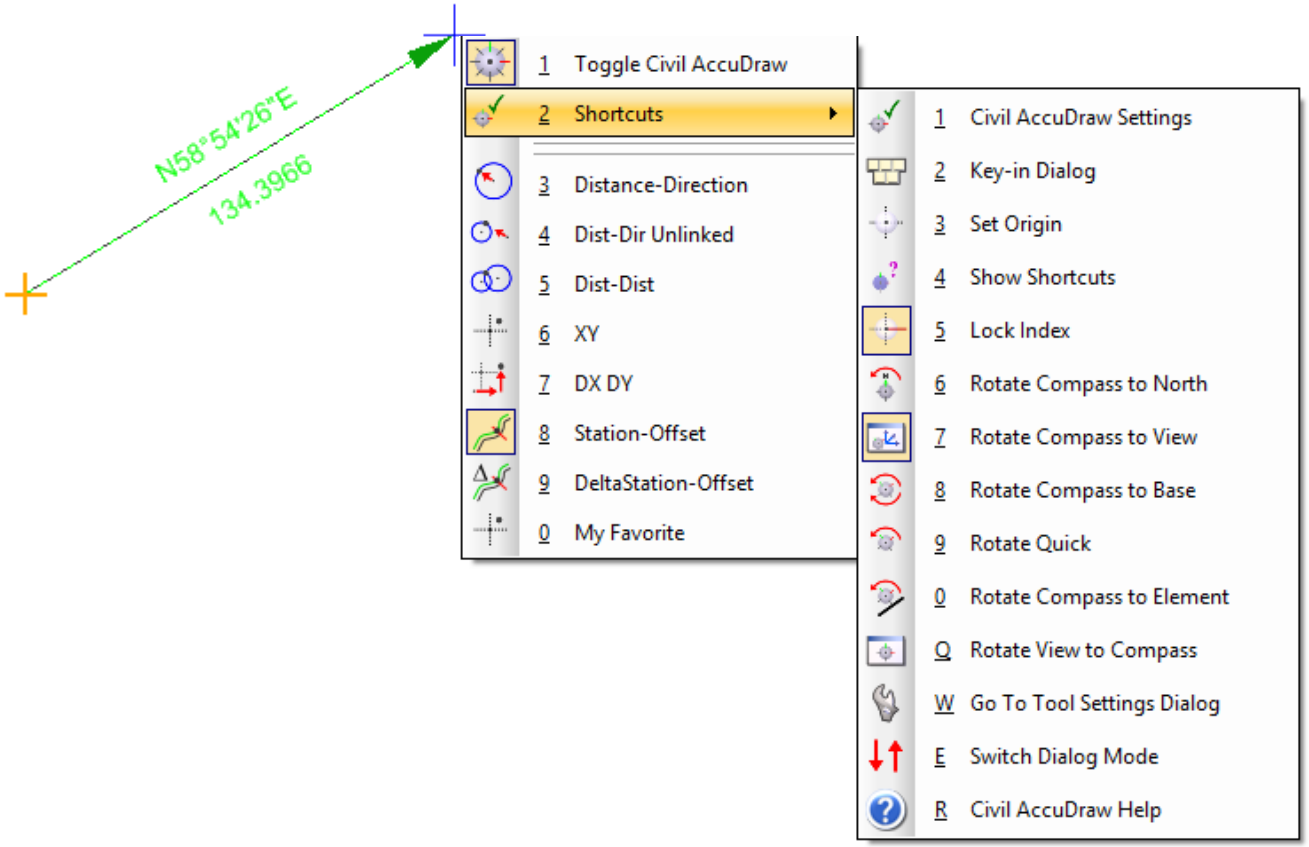
The cursor prompt dialog can be changed to a fixed box dialog by pressing the down arrow on keyboard.



Bentley

Tips and Tricks

Pressing the space bar on your keyboard opens a direct pick menu.



Bentley

Why You Need Civil AccuDraw …

Communicates Precision Input

- Provides point input (e.g. coordinates, distance, direction, station, offset, etc.) to any MicroStation or Civil command or construction which requires a point.
  - Note: Civil AccuDraw is not limited to only civil commands. It can also be used with MicroStation commands.

Communicates Design Intent

- Civil commands can persist the Civil AccuDraw input as rules on the points.

Bentley

Precision Input

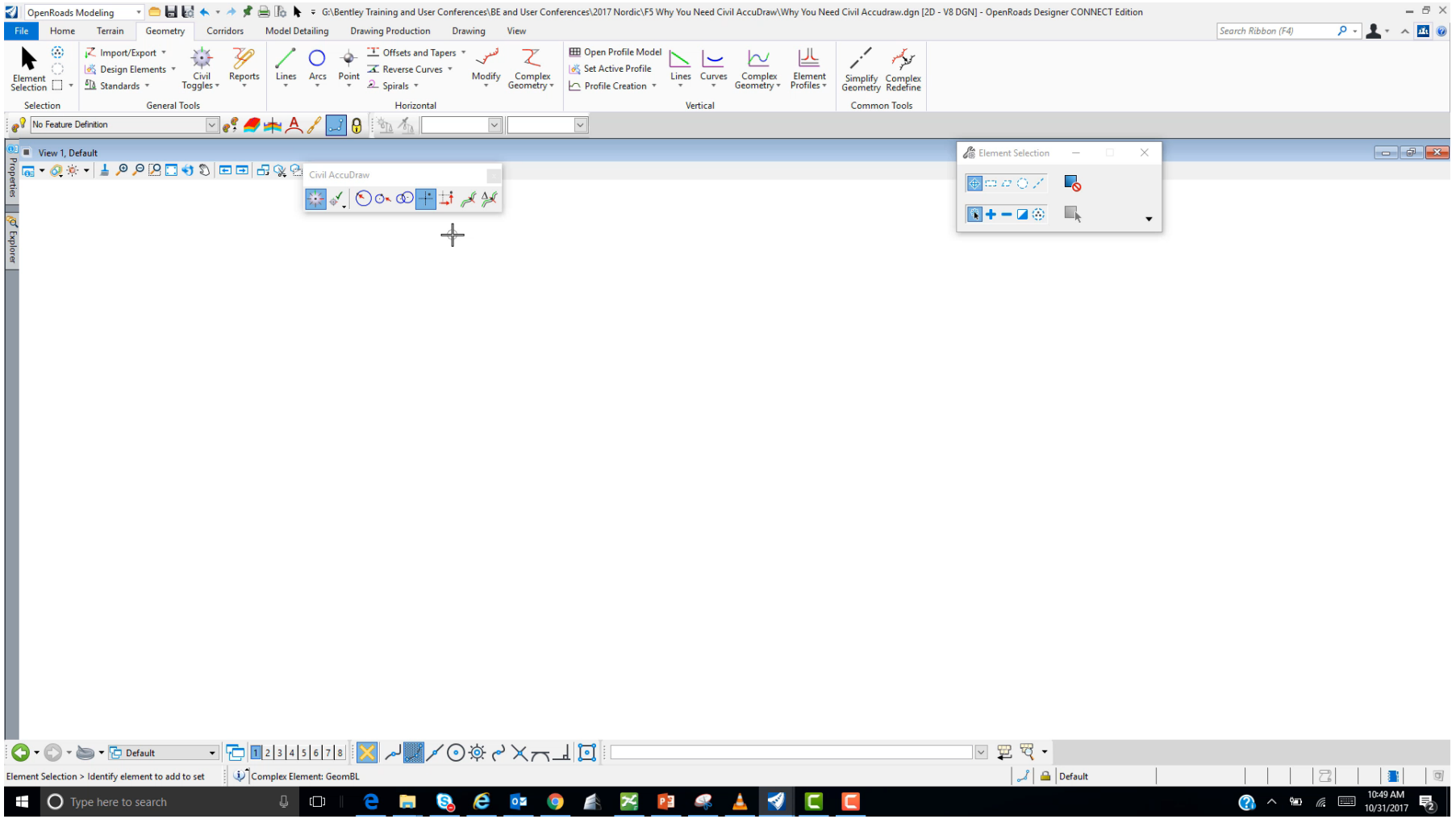
- Providing point input (*e.g. coordinates, distance, direction, station, offset, etc*.) to any MicroStation or Civil command or construction which requires a point.

Bentley

Horizontal Geometry (e.g. Right of Way)

- Existing Right of Way
  - Using coordinate (X,Y) input into *Elements by PI* command
- Easements
  - Based off existing Right of Way
  - Station/offset input (updates!)
- Parcels
  - Using X,Y for points
  - Using distance, direction

Bentley

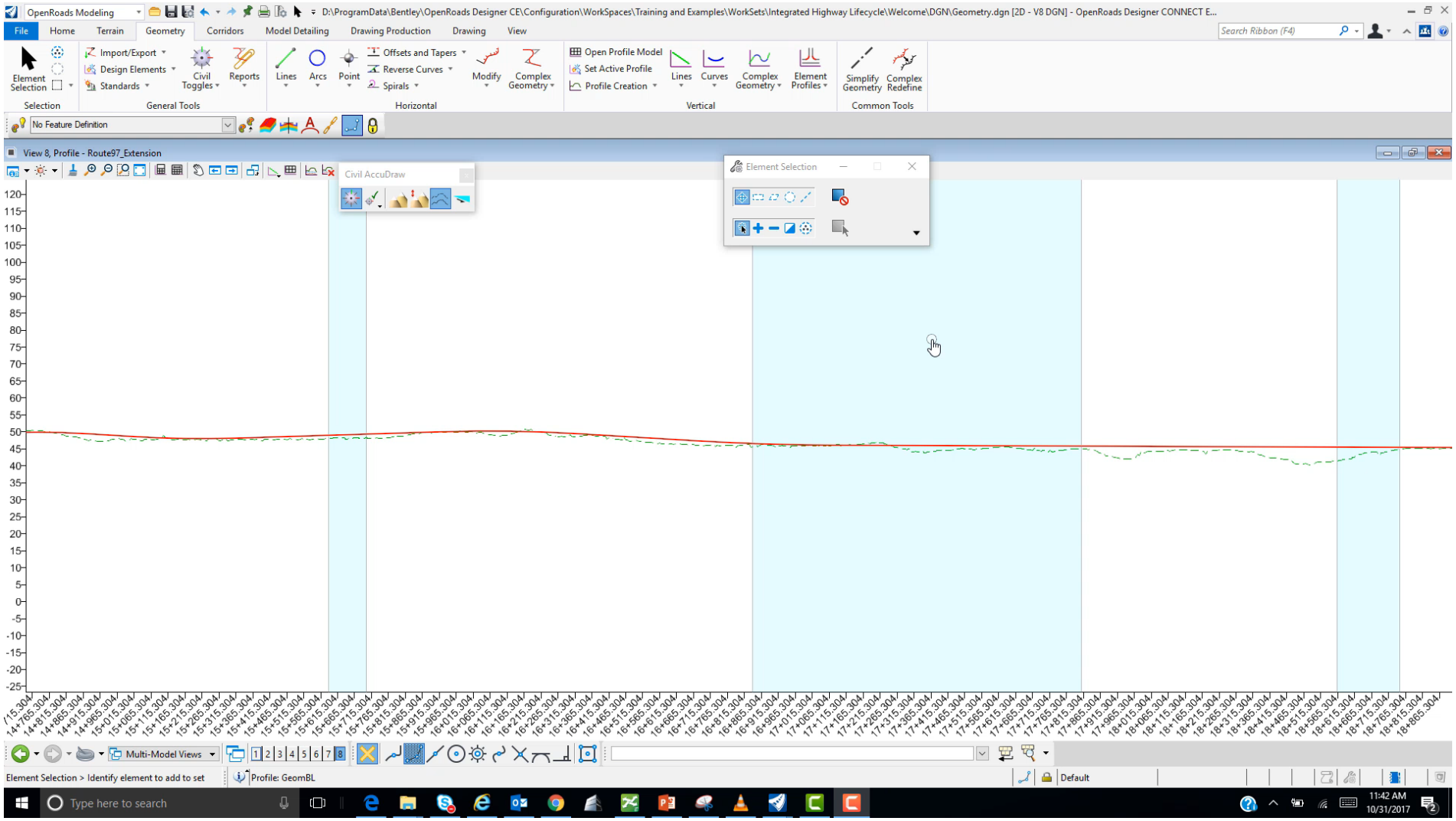


Bentley

Profiles

- Special Ditch Grades
  - Station / Elevation
  - Station / Slope
- Subsurface Design Profiles
  - Profile offsets
- Bridge Deck Clearances
  - Profile offsets
  - Station / dZ, Z

Bentley



Bentley

Why You Need Civil AccuDraw …

Communicates Precision Input

- Provides point input (e.g. coordinates, distance, direction, station, offset, etc.) to any MicroStation or Civil command or construction which requires a point.
  - Note: Civil AccuDraw is not limited to only civil commands. It can also be used with MicroStation commands.

Communicates Design Intent

- Civil commands can persist the Civil AccuDraw input as rules on the points.

Bentley

Design Intent

- *Design Intent* is the act of preserving the rules and relationships creating during the design process in order to maximize the downstream benefits of automated updates.

Bentley

Automatic Updates

Everyone wants software that will automatically update the design whenever a change is made in order to eliminate errors.

However, if not done correctly, what most people don't realize is that automatic updates can generate just as many errors and omissions as it eliminates.

The reason for this is simple – if you are going to update a design correctly, then the software *must* remember the engineering decisions (i.e. the *design intent*) that originally went into the creation of those elements and components.

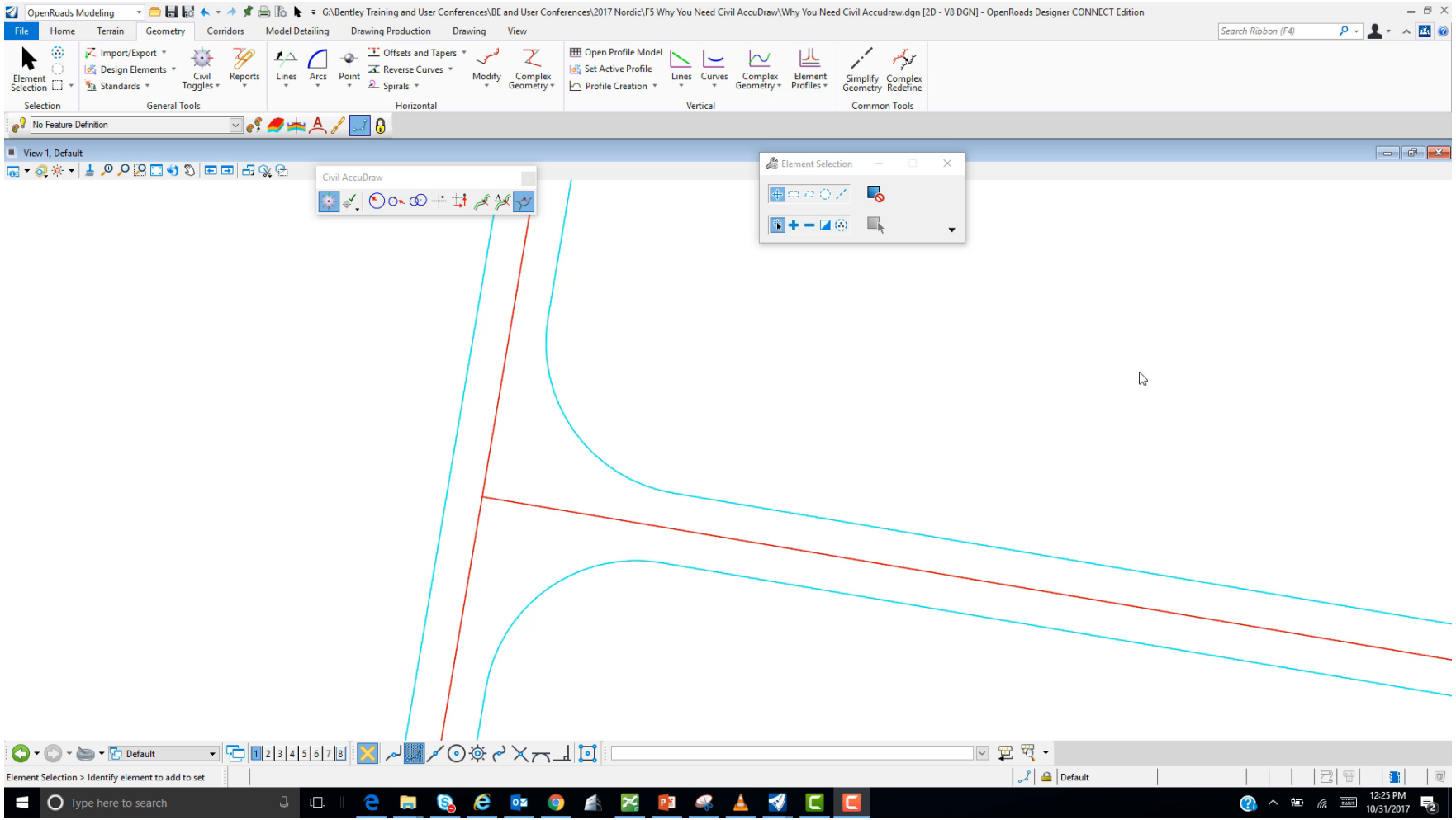
If you don't, then any updates you do will involve assumptions and guessing which will obviously lead to additional errors and omissions.

How Do I Communicate Design Intent?

How do I communicate to the software what I'm intending to do?

This is the key to using ***Design Intent*** properly – making sure that, as a user, I'm able to store rules and relationships that effectively communicate how I expect that design to update.

Bentley



Bentley

Design Intent for Free

In many cases, there is nothing for you as a user to necessarily think about or consider. You just get the proper rules and relationships as part of the *commands* you are using.

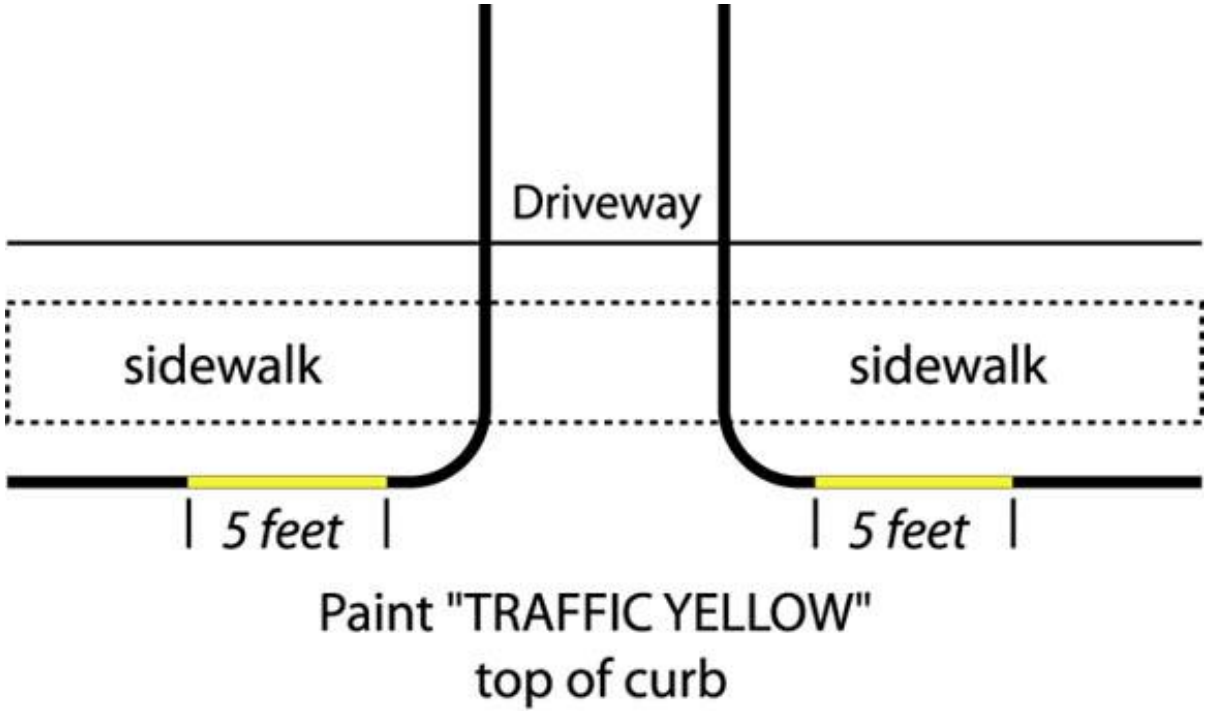
- Terrain Models
  - Update from Source
  - Existing ground line from terrain
- Vertical Geometry
  - Complex from Simple
- Horizontal Geometry
  - Gaps, Offsets, Trimming, etc.

Bentley

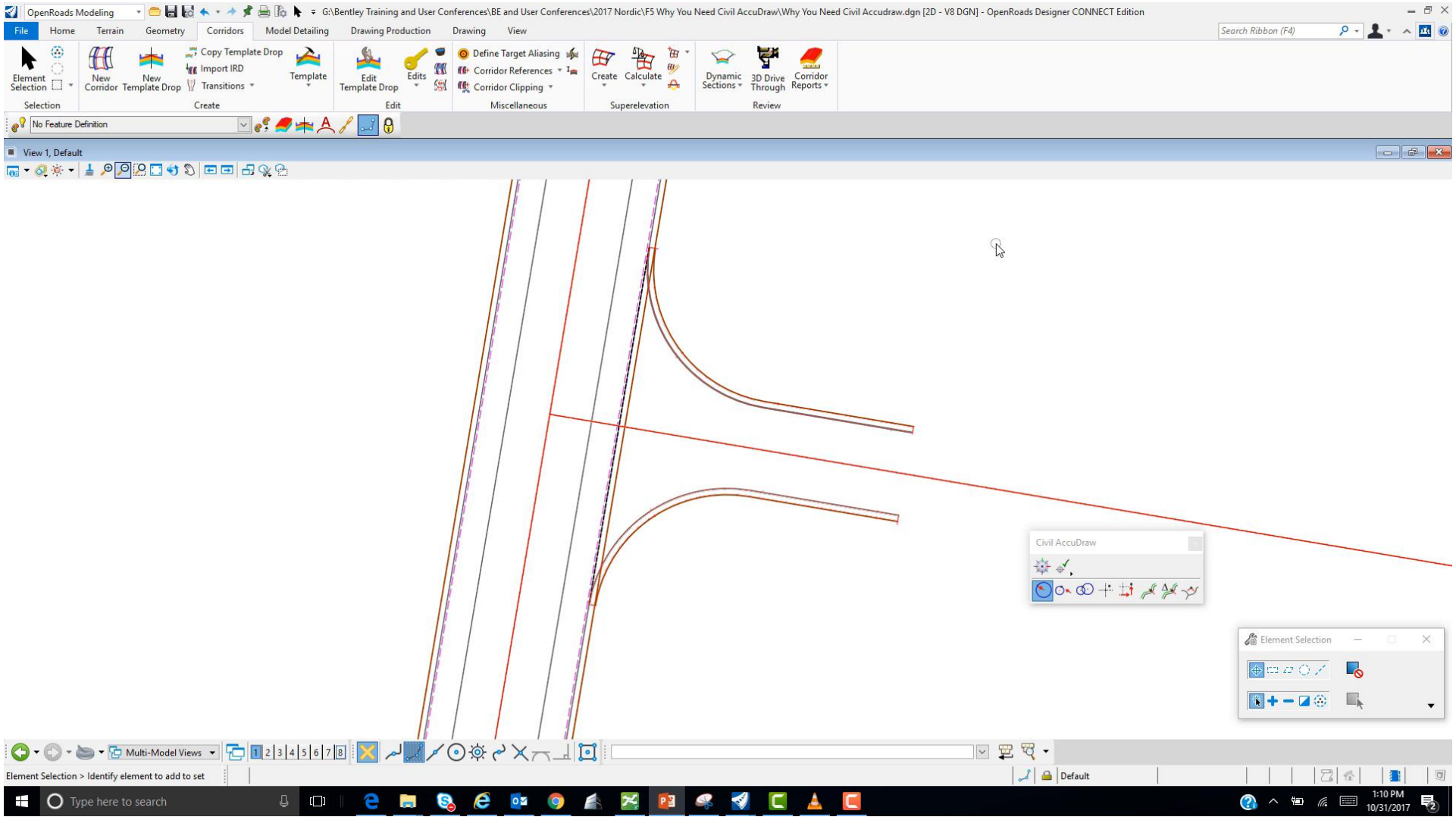
MicroStation Snaps

MicroStation snaps are a simple yet incredibly powerful way of communicating your design intent to the software.

- ***Key Stations***



Bentley



Bentley

Civil AccuDraw

However, there are times that, in order to communicate your design intent, you need more than just a simple MicroStation snap. In these scenarios, Civil AccuDraw becomes an indispensable tool, because the parameters you use with Civil AccuDraw are persisted as part of the rules.

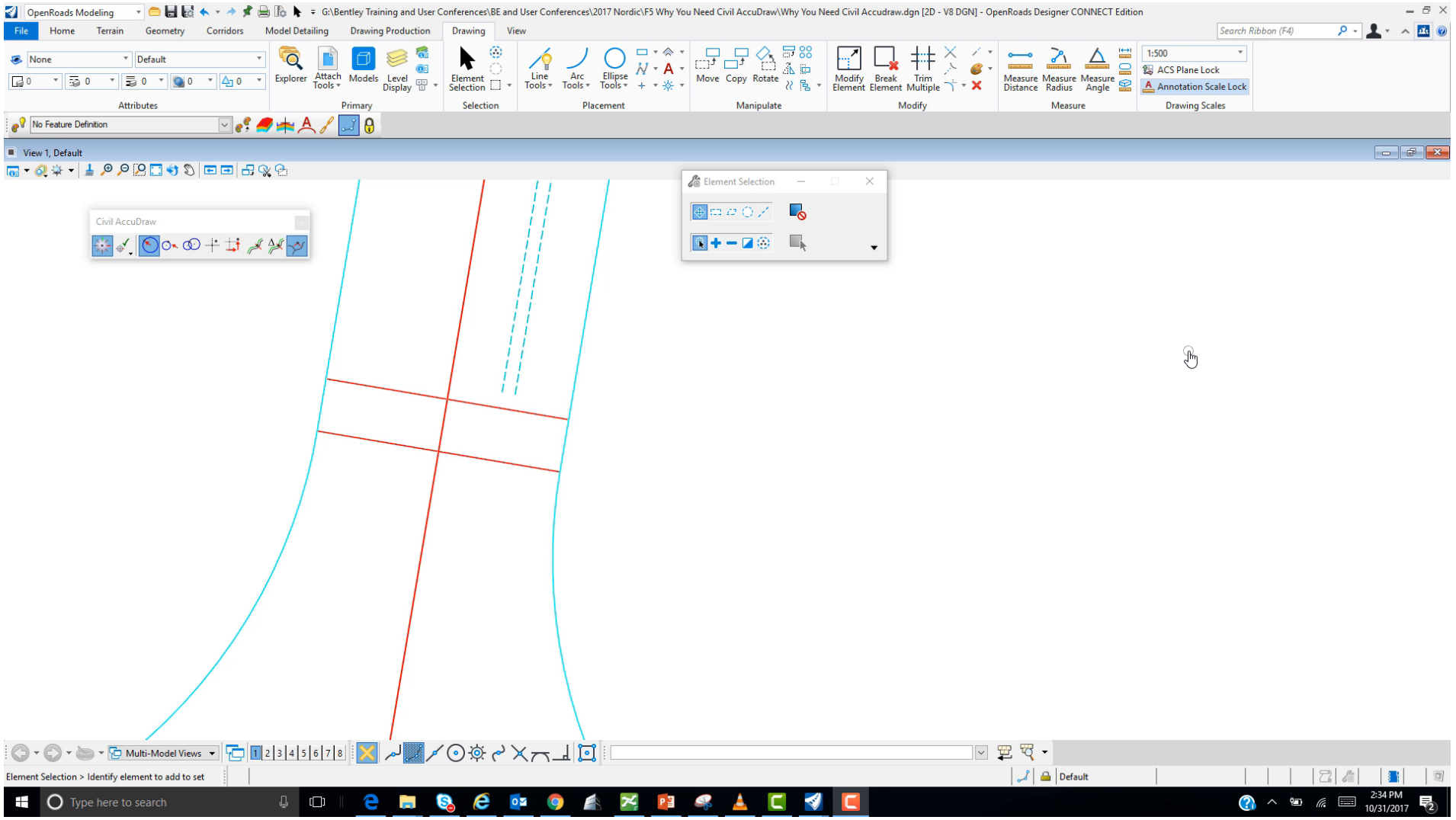
Bentley

Civil AccuDraw

An example from Horizontal geometry.

- ***Tying the Turn Lane to the Crosswalk***

Bentley



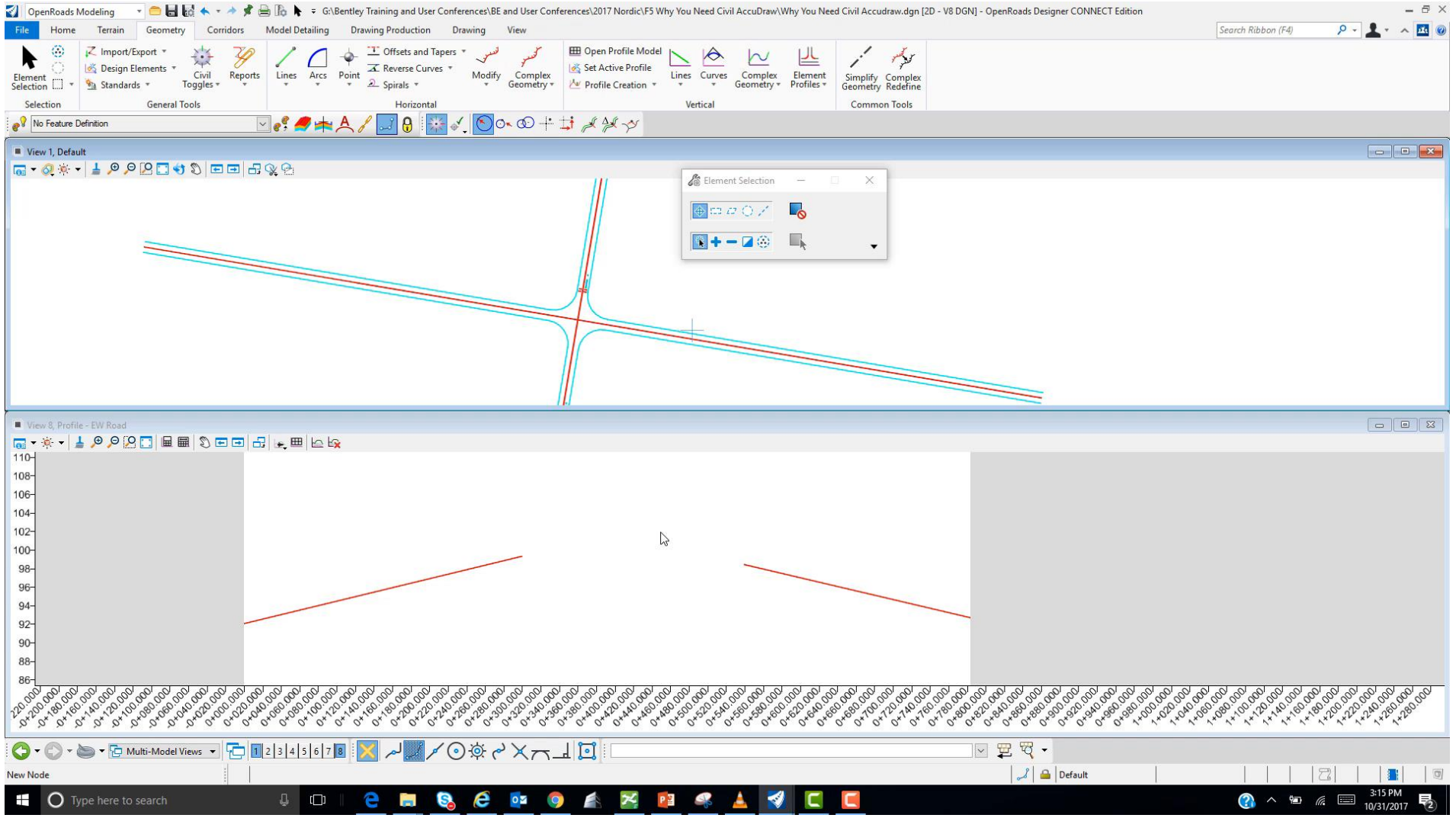
Bentley

Civil AccuDraw

An example from Vertical Geometry.

- ***Minimum Vertical Clearance***

Bentley



Bentley