# Why You Need Civil AccuDraw

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### 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.

Button Bar AccuSnap Multi-snaps Nearest Keypoint Midpoint Center Origin Bisector Intersection Tangent Tangent Point Perp Perp Point Parallel Point Through Point On Multi-snap 1 Multi-snap 2 Multi-snap 3

### 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.



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### 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.* 



### 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.



### The Basics

Activating, Controlling and Customizing Civil AccuDraw



## Activating the Civil AccuDraw toolbar

### **OpenRoads Modeling : Geometry : General Tools**





### 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**°



#### Civil AccuDraw toolbar





## Settings are similar to MicroStation AccuDraw

#### **Operation Tab**

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## Settings are similar to MicroStation AccuDraw

#### **Display Tab**

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These settings control the heads-up dynamics.

Ħ	Civil AccuDraw Settings 🛛 – 🗖 🗙
Operation Display (	Coordinates Favorites
Use Default Values:	
<u>Compass</u> X Axis:	LightCoral
Y Axis:	YellowGreen
Z Axis:	MediumOrchid
Fill:	ComflowerBlue
Points:	4
Constraint Dynamics Show Constraints:	$\checkmark$
Standard:	Silver
Hilite:	WhiteSmoke
Locked:	Blue
	Shortcut Key-ins



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## Settings are similar to MicroStation AccuDraw

#### **Coordinates Tab**

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Offset:	0.0000
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Tolerance:	10



## Favorites (Civil AccuDraw only)

#### Support user-customized methods.

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Add	X Distance Direction Station Offset Delta Station Delta Offset DX	lete			1	ł

### **Horizontal Methods**



### **Vertical Methods**



#### All settings are detailed in the OpenRoads Help.



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

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



## File > Settings > File > Design File > Civil Formatting

#### **Coordinate Settings**



## Settings > Design File > Civil Settings

### Profile (slope) Settings

	Precision	0 123
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	Ratio Format	Run:Rise
	Ratio Precision	0.123
	Vertical Curve Parameter For	Kvalue

## Settings > Design File > Civil Settings

### **Station Settings**

<u>Category</u>	Coordinate Settings		
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Active Scale	Format	X, Y	
Angle Readout	Precision	0.1234	1
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Civil Formatting	Ratio Settings (Distan	ce:offset)	
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Grid			
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Snaps	Format Delimiter	+	
Stream	Precision	0.123	
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Working Units	Radius Settings	~	
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	Degree Of Curve Length	100.0000m	1
	Radius Tongle Char	d	1.
	Focus Item Description		
	Select estenen i te vieu		
	Select category to view.		

## Settings > Design File > Working Units

• dX, dY, dStation, Length, Profile Offset, etc.





## Settings > Design File > Angle Readout





### **Tips and Tricks**

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

	Enter End Point	
128°E	Distance 134.3966	
N58° 54 134.3966	Station         0+00.00           Offset         0.0000	
+	Civil AccuDraw   Station   0+00.00   Element   Offset   0.0000   Element	×



### **Tips and Tricks**

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



Why You Need Civil AccuDraw ...

### **Communicates Precision Input**

- Provides <u>point</u> 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.



### **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.



## 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



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### **Profiles**

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





Why You Need Civil AccuDraw ...

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## **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.



### 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 <u>must</u> 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.







## **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.



### **MicroStation Snaps**

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

Key Stations





### **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.



### **Civil AccuDraw**

An example from Horizontal geometry.

• Tying the Turn Lane to the Crosswalk







### **Civil AccuDraw**

### An example from Vertical Geometry.

• Minimum Vertical Clearance





