



Annotate Menu | Survey

Class Objectives

In this class, we will be discussing the principles of how annotations work in Carlson, learn how to use the annotation routines found in the program, pick some tips & tricks and learn how to create custom configurations files to set your standards.

The objectives for this class are:

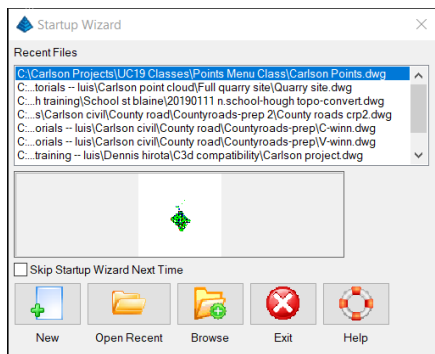
- Understand How Annotations Works in Carlson
- Annotating Lines and Curves
- Creating Line/Arc Tables
- General Annotations

Carlson Project Setup

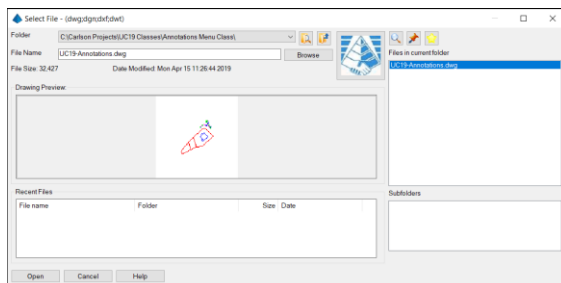
You will start by opening an existing drawing:

Comment: take a moment to copy the UC19-Annotations.dwg to your C:\Carlson Projects\UC19 Classes\Annotations Menu Class folder.

- Open *Carlson* by double-clicking the icon on your desktop.



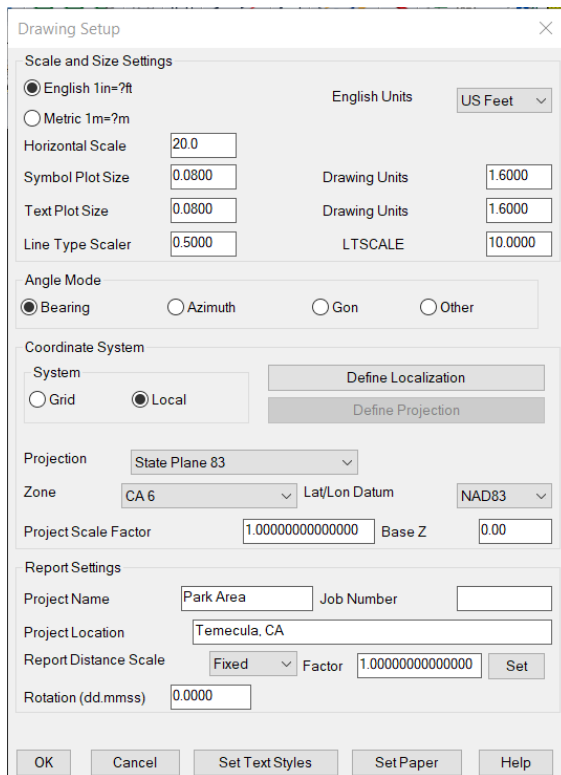
- In the *Startup Wizard* dialog, click **Browse**, then browse to **C:\Carlson Projects\UC19 Classes\Annotations Menu Class** folder and select **UC19-Annotations.dwg** file. Click **Open**.





The file we will be working on has existing lot lines, a few points collected using field to finish, a building and the project has been located.

- From the **Settings** menu > select **Drawing Setup** to open the *Drawing Setup* dialog.



- Look at the *Scale and Size Settings*, the drawing/project scale is set to 1:20. This is important to know whether you are starting a new drawing or working on an existing one as the combination of scale factor and the plotted text height will determine the text size in drawing units. That is, in CAD, the text height is calculated as the *drawing scale x plotted height*.

Note the Text Plot Height variable is set to 0.08 inches. This means that any text placed with these default value will have a size of 1.6 drawing units (20 x 0.08).

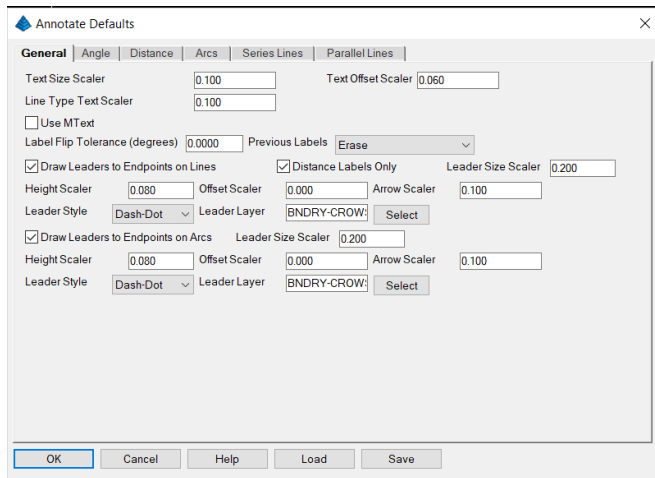
This is part of Carlson's annotation power because you can have consistent plotted text heights regardless of the drawing scale used. In other words, set the plot scale and set the default text heights and your text will be consistent.

Now, let's take a look at the annotation specific defaults to familiarize you with the available settings:

- From the **Annotate** menu > select **Annotation Defaults** to open the *Annotations Defaults* dialog. Note that there are six tabs: General, Angle, Distance, Arcs, Series Lines and Parallel Lines.

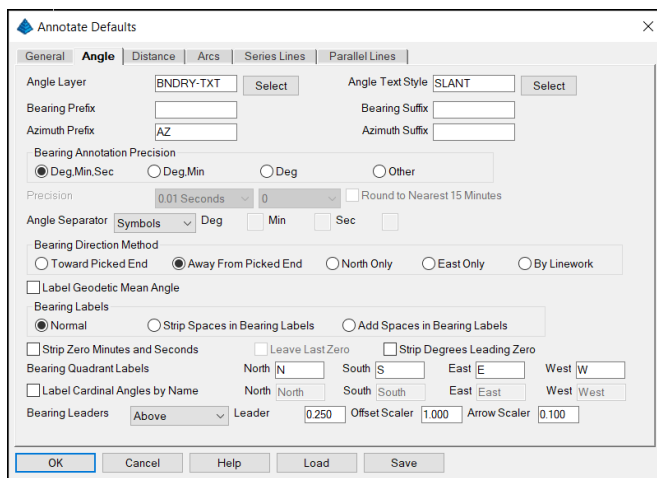


- Click on the **General** tab.



The 'Annotate Defaults' dialog box is shown with the 'General' tab selected. It contains various settings for text and leader annotations, including scalers for text size, line type, and leader size, as well as checkboxes for drawing leaders to endpoints and distance labels only. The 'Previous Labels' dropdown is set to 'Erase'.

- Note that in this dialog you will set the desired plotted height, named *Text Size Scaler* in this dialog, for the annotations that you will be placing.
 - You can also determine the text being placed is single line text (default) or MText/multiline text. To decide on this variable, refer to your CAD drafting standards. Using MText has the added benefit of allowing you to use the MText Editor which can be useful in the drafting process.
 - You want to make sure that *Previous Labels* is set to **Erase**.
 - Lastly, note that, if working with leaders, you can set the layer on which they will be drafted.
- Click on the **Angle** tab.

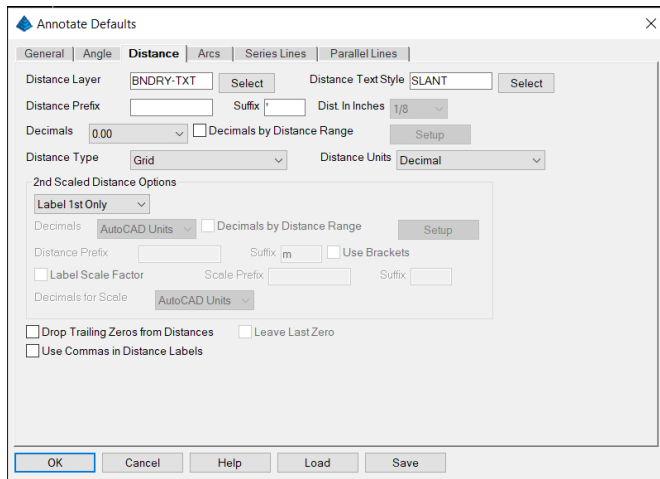


The 'Annotate Defaults' dialog box is shown with the 'Angle' tab selected. It contains settings for angle annotations, including the angle layer, bearing and azimuth prefixes/suffixes, bearing annotation precision, angle separator, bearing direction method, and bearing labels. The 'Bearing Annotation Precision' is set to 'Deg.Min.Sec'.

- Once again, note how you can control the layers on which the labels will be placed.
 - Whether prefixes and suffixes are to be added to the annotation, again to match the preferences in your organization.
 - Whether symbols are to be used to separate the angle degrees, minutes and seconds when labeled.

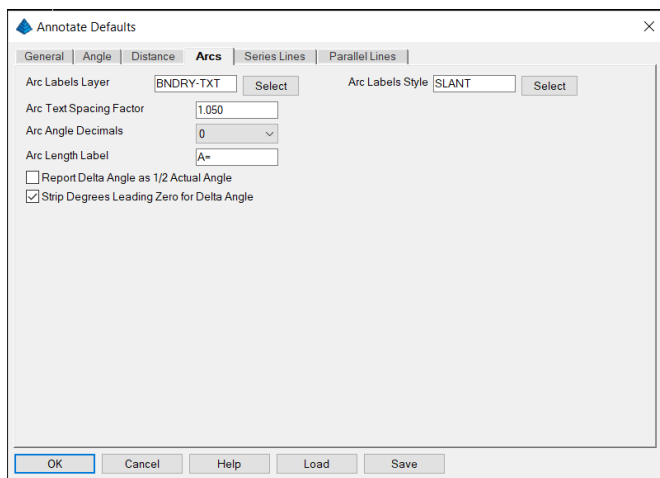


- Of interest, note the method being used to determine the *Bearing Direction* when entities are selected in the drawing. You may have a personal preference that will determine a preferred method that makes you more efficient. For now, keep **Away From Picked End**.
- Click on the **Distance** tab.



The screenshot shows the 'Annotate Defaults' dialog box with the 'Distance' tab selected. The 'Distance Layer' is set to 'BNDRY-TXT' and 'Distance Text Style' is 'SLANT'. 'Distance Prefix' and 'Suffix' are empty. 'Dist In Inches' is set to '1/8'. 'Decimals' is '0.00' and 'Decimals by Distance Range' is unchecked. 'Distance Type' is 'Grid' and 'Distance Units' is 'Decimal'. Under '2nd Scaled Distance Options', 'Label 1st Only' is selected, 'Decimals' is 'AutoCAD Units', and 'Decimals by Distance Range' is unchecked. 'Distance Prefix' and 'Suffix' are empty, and 'Use Brackets' is unchecked. 'Label Scale Factor' is unchecked, 'Scale Prefix' and 'Suffix' are empty. 'Decimals for Scale' is 'AutoCAD Units'. 'Drop Trailing Zeros from Distances' and 'Use Commas in Distance Labels' are unchecked. 'Leave Last Zero' is unchecked. Buttons at the bottom include 'OK', 'Cancel', 'Help', 'Load', and 'Save'.

- Note how in this tab you can determine the layers to be used when labeling distances and the use of prefixes and suffixes.
- You can also set the number of *Decimal Places* in the label and whether to *Drop Trailing Zeros from Distances*
- Click on the **Arcs** tab.



The screenshot shows the 'Annotate Defaults' dialog box with the 'Arcs' tab selected. 'Arc Labels Layer' is 'BNDRY-TXT' and 'Arc Labels Style' is 'SLANT'. 'Arc Text Spacing Factor' is '1.050'. 'Arc Angle Decimals' is '0'. 'Arc Length Label' is 'A+'. 'Report Delta Angle as 1/2 Actual Angle' is unchecked. 'Strip Degrees Leading Zero for Delta Angle' is checked. Buttons at the bottom include 'OK', 'Cancel', 'Help', 'Load', and 'Save'.

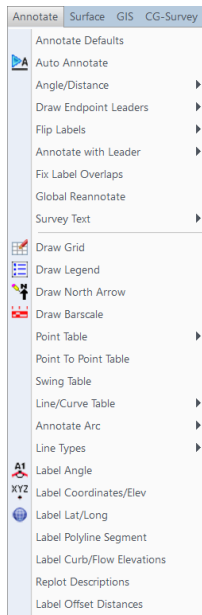
- By now, you are probably noticing a trend. In this tab you will be able to set the arc annotation layers and relevant annotation settings.



You are ready to start annotating. Note that Carlson provides default annotations settings, therefore you can annotate your drawing without needed to review all the defaults.

The Annotate Menu

The *Annotate Menu* is found in the Survey, Civil and Construction modules and, in general, through it you can access routines to:



- Label lines with bearing/azimuth and distances
- Special lines
- Coordinates
- Curves
- Curve and line tables
- Place grids, bar scale and north arrow

Annotate Lines and Curves

Let's start by annotating the lot lines in the drawing:

- From the **Annotate** menu > select **Angle/Distance** > then **Bearing_Distance**.
 - *Comment: If labeling by Azimuth, by default Carlson is configured to use North Azimuth. To use South Azimuth, under the Settings menu > Carlson Configure > General Settings > check Use South Azimuth.*
- Note the command prompt:

Select *Line or Polyline [Size/Points]:*



- Zoom to the eastern most lot and select the line on far left. Depending on the selection method you choose in the defaults, the reported angle will be away from the end you selected or to the end you selected.
 - *Comment: The angle is labeled according to the Annotate Defaults "Bearing Direction Method". The default is set to "Away From Picked End", there are other options that you can choose from to match your preferences.*
- Now, try using the **Stacked_BearingDistance** routine.
- Select other labeling methods to annotate the remaining lines for this one lot.
 - *Comment: Open the Annotation Defaults and make changes if you want to try other options.*

As you annotate the lines, you may need to change the position of the labels or use leader lines:

- From the **Annotate** menu > select **Flip Labels** > then **Flip Selected Labels**. Select one of the labels just placed.
- Now select **Flip Labels** > then **Mirror Selected Labels** and pick the same label.

As you can see, there are several tools that can be used to make the drawing and annotations more readable.

- You can also change the reported angle by using the **Flip Labels** > **Switch Bearing/Azimuth Quadrant** routine. Select any label and note how the labeled angle changes.

Continuing with readability, you can place labels using leaders and move labels using a leader to improve the drawing. Let's move some labels using leaders:

- From the **Annotate** menu > select **Annotate with Leader** > then **Move Label with Leader**. Select any of the annotations you just placed.
- Now try the **BRG-Distance with Leader**. Select one of the lines you had already annotated. Notice how the previous label is deleted and a new is created.

You may be wondering, what if a line(s) is moved? The answer is that the label will update. Go on give it a try by moving one of the lot endpoints.

- In the drawing area, left-click on any labeled line. This will display the entity Grips (blue boxes).
- Left-click on a grip and drag to a new position. Notice how the annotation will update to reflect the new distance and angle of the line.
 - *Comment: By default, Carlson links labels with linework. This setting is found under the Settings menu > Carlson Configure > General Settings > Link Labels with Linework.*

Alright, now let's label curves which you will find similar to lines:

- From the **Annotate** menu > select **Annotate Arc** > then **Label Arc**. Select the edge of sidewalk arc on the northern side of the drawing (magenta line).



Custom Arc Label [X]

	Label	Row	Side	Order
Arc Length	A=	1	Inside	First
Radius	R=	2	Inside	First
Delta Angle	D=	None	Outside	First
Chord Angle	CB=	None	Inside	First
Chord Length	CL=	None	Inside	First
Tangent	T	None	Inside	First
Degree Of Curve	DOC	None	Inside	First
External	E	None	Inside	First

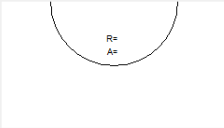
Chord Angle Mode: ☒ Bearing ☐ Azimuth ☐ Gon

Curve Angle Mode: ☒ Degree ☐ Gon

Type of Curve: ☒ Road ☐ Railroad

Flip Labels: [v]

☐ Use Symbol for Delta Angle Label



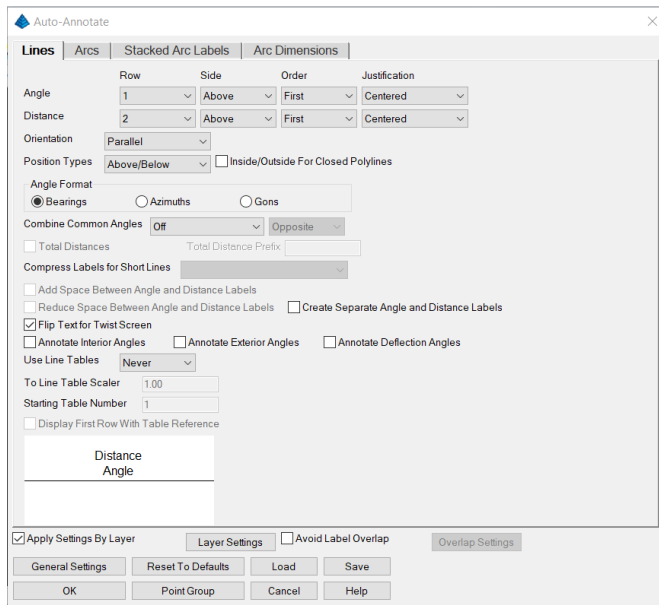
General Settings [b] Reset To Defaults [b] Load [b] Save [b]

OK [b] Cancel [b] Help [b]

- Add or remove the information you want labeled on the arc by setting the corresponding label to a row number or none.
- Similarly, for each labeled information select a side and order.
- When ready click **OK** and the arc will be labeled in the drawing.
- To label using a leader, from the **Annotate** menu > select **Annotate Arc** > then **Stack Label Arc**. Select the same curve on the edge of sidewalk, the previous label will be erased.
- Follow the prompts on the command line to place the label and the beginning and ending of the leader line.

Lastly, to wrap this lesson, you may be thinking about making this labeling process more efficient. So, let's use the *Auto-Annotate* routine which allows you to select a group of arcs, lines and polylines to label in any combination of labeling styles.

- From the **Annotate** menu > select **Auto-Annotate**. This will open the auto-annotate settings dialog.

Auto-Annotate

Lines | Arcs | Stacked Arc Labels | Arc Dimensions

	Row	Side	Order	Justification
Angle	1	Above	First	Centered
Distance	2	Above	First	Centered

Orientation: Parallel

Position Types: Above/Below ☐ Inside/Outside For Closed Polylines

Angle Format: ☒ Bearings ☐ Azimuths ☐ Gons

Combine Common Angles: Off Opposite

☐ Total Distances Total Distance Prefix

Compress Labels for Short Lines

☐ Add Space Between Angle and Distance Labels

☐ Reduce Space Between Angle and Distance Labels ☐ Create Separate Angle and Distance Labels

☒ Flip Text for Twist Screen

☐ Annotate Interior Angles ☐ Annotate Exterior Angles ☐ Annotate Deflection Angles

Use Line Tables: Never

To Line Table Scaler: 1.00

Starting Table Number: 1

☐ Display First Row With Table Reference

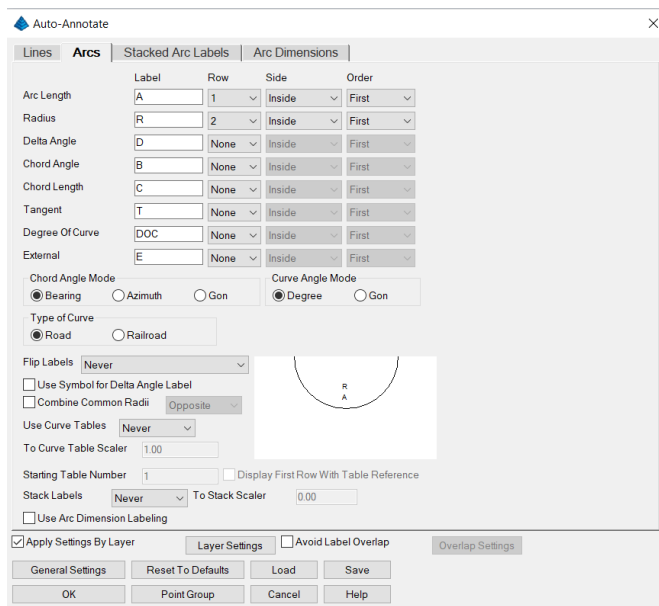
Distance
Angle

☒ Apply Settings By Layer Layer Settings ☐ Avoid Label Overlap Overlap Settings

General Settings Reset To Defaults Load Save

OK Point Group Cancel Help

- In the **Lines** tab, take a moment to review the settings and adjust to your liking.
- Open the **Arcs** tab and do the same.



Auto-Annotate

Lines | **Arcs** | Stacked Arc Labels | Arc Dimensions

	Label	Row	Side	Order
Arc Length	A	1	Inside	First
Radius	R	2	Inside	First
Delta Angle	D	None	Inside	First
Chord Angle	B	None	Inside	First
Chord Length	C	None	Inside	First
Tangent	T	None	Inside	First
Degree Of Curve	DOC	None	Inside	First
External	E	None	Inside	First

Chord Angle Mode: ☒ Bearing ☐ Azimuth ☐ Gon

Curve Angle Mode: ☒ Degree ☐ Gon

Type of Curve: ☒ Road ☐ Railroad

Flip Labels: Never

☐ Use Symbol for Delta Angle Label

☐ Combine Common Radii Opposite

Use Curve Tables: Never

To Curve Table Scaler: 1.00

Starting Table Number: 1 ☐ Display First Row With Table Reference

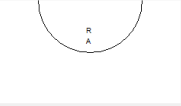
Stack Labels: Never To Stack Scaler: 0.00

☐ Use Arc Dimension Labeling

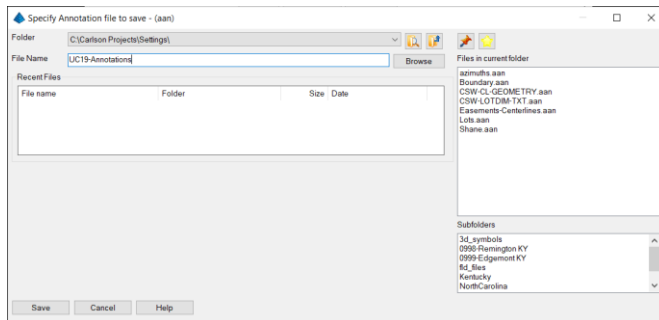
☒ Apply Settings By Layer Layer Settings ☐ Avoid Label Overlap Overlap Settings

General Settings Reset To Defaults Load Save

OK Point Group Cancel Help



- Similar to other configuration/settings options in Carlson, once you find a style(s) of your linking, these can be saved for easy reuse in other projects. Click **Save**.



- Type **UC19-Annotations Class** in the *File Name* field and click **Save**.
- Now click **OK** to annotate the entities.
- Note the command prompt:

```
Select Lines, Arcs and Polylines to Annotate.  
Filter/<Select entities>
```

- Use a window selection to select the remaining edge of sidewalk linework in the drawing.
- Press **Enter** to complete the selection set and Carlson will annotate them.

Curve and Line Tables

As you can notice, the sidewalk annotation is too cluttered giving us the opportunity to illustrate the curve and line table functionality. To begin with, let's take a look at the defaults.

- From the **Annotate** menu > **Line/Curve** table > select **Table Defaults**.



Line/Curve Table Defaults

Label Text Layer: LAB_TEXT Set Table Text Layer: TBL_TEXT Set

Label Text Style: ROMANS Set Table Text Style: ROMANS Set

Label Text Size Scaler: 0.08 Table Text Size Scaler: 0.08

☐ Combine Line and Curve Tables

Line Label Prefix: L Curve Label Prefix: C

Line Table Title: Curve Table Title:

Set Line Table Labels Set Curve Table Labels

☐ Prompt for Label Location Label Symbol: None

Leader Arrow Scaler: 0.10

Line Table Distance

Distance Format

☒ Horizontal ☐ Slope ☐ None

☐ Total Distances

Label Angles in

☐ Azimuths ☒ Bearings ☐ Gons ☐ None

Automatic Table Update

☐ On ☒ Off

Label Alignment

☐ Horizontal ☒ Parallel

☐ Use Table Entity Row Height Factor: 1.00

☐ Combine Equal Rows

☐ Append First Table Item To Line/Curve Label

Curve Options

	Sequence#
Radius	1
Arc Length	2
Chord Length	3
Chord Angle	4
Delta Angle	5
Tangent	
Degree of Curve	
Radial Bearing-in	
Radial Bearing-out	
Tangent Bearing-in	
Tangent Bearing-out	
PC Station (Point of Curvature)	
PI Station (Point of Intersection)	
PT Station (Point of Tangency)	

OK Cancel Help Load Save

- Similar to other routines, you control the layer(s) that will be used, the text style and plotted height in the settings.
- Toggling on *Combine Line and Curve Tables* will create a single table with all the line and curve data. For this lesson, we will keep it off and place two separate tables.
- Click **Set Line Table Labels** to open the line table header settings. Click **OK** when done.

Line Table Labels

Field	Label	Scaled Label	Width	Justification	Precision
Line Number	LINE		6.250	LEFT	
Bearing	BEARING		14.000	LEFT	
Azimuth	AZIMUTH		14.000	LEFT	
GON	GONS		14.000	LEFT	
Horiz Distance	DISTANCE	DISTANCE2	11.500	RIGHT	0.00
Slope Distance	SLOPE DIST	SLOPE DIST2	11.500	RIGHT	0.00

OK Cancel Help

- Click **Set Curve Table Labels** to open the curve table header settings. Click **OK** when done.



Field	Label	Scaled Label	Width	Justification	Precision
Curve Number	CURVE		8.000	LEFT	
Radius	RADIUS	RADIUS2	9.000	LEFT	0.00
Arc Length	ARC LENGTH	ARC LENGTH2	14.000	LEFT	0.00
Chord Length	CHORD LENGTH	CHORD LENGTH2	14.000	LEFT	0.00
Chord Bearing	CHORD BEARING		15.000	LEFT	
Chord Azimuth	CHORD AZIMUTH		15.000	LEFT	
Chord GONS	CHORD GONS		15.000	LEFT	
Delta Angle	DELTA ANGLE		13.000	LEFT	
Tangent	TANGENT	TANGENT2	10.000	LEFT	0.00
Degree Of Curve	DEGREE OF CURVE		17.000	LEFT	
Radial Bearing-in	RADIAL BEARING-IN		19.000	LEFT	
Radial Bearing-out	RADIAL BEARING-OUT		19.000	LEFT	
Tangent Bearing-in	TANGENT BEARING-IN		19.000	LEFT	
Tangent Bearing-out	TANGENT BEARING-OUT		19.000	LEFT	
Point of Curvature	PC		5.000	LEFT	
Point of Intersection	PI		5.000	LEFT	
Point of Tangency	PT		5.000	LEFT	

OK Cancel Help

- Toggle **Horizontal** for the *Distance Format*.
- *Label Angles in Bearings*.
- *Label Alignment Parallel*.
- *Automatic Table Update On*.
- If you're satisfied with these settings, click **Save** to save these annotation table settings into a configuration file that can be reused.

Line/Curve Table Defaults to Save - (lct)

Folder: C:\Carlson Projects\Settings\

File Name: UC19-Line and Curve Table Settings

Recent Files:

File name	Folder	Size	Date

Files in current folder:

Subfolders:

- 3d_symbols
- 0995-Remington KY
- 0995-Edgemont KY
- fd_files
- Kentucky
- NorthCarolina

Save Cancel Help

- Type **UC19-Line and Curve Table Settings** in the *File Name* and click **OK** to close the *Table Defaults* dialog.

Now that we have set the table configuration as we like, let's annotate the westernmost lot in the drawing using a line table.

- From the **Annotate** menu > **Line/Curve Table** > select **Line Table**. Note the command prompt:

Select line [Points/<select line or polyline>]:

Starting on the left, select the first line segment.



- Now you are prompted to enter the line number:

Line number <1>:

Press **Enter** to accept the entry.

- Now you are prompted for the starting point for the table.

Starting point or point number of line table (Enter for none):

Graphically pick a point below the lot lines. Notice how the table with the information for the first line will be placed.

- You are now prompted to select the next line. Select the second line going clockwise and notice how the prompt proposes **2** for the label, thus you can press **Enter** to accept the entry and the line will be labeled and the information added to the table.
- Repeat for the remaining four lot lines.
- Once the five lines have been annotated, press **Enter** to complete the command.

To wrap this lesson, take a moment to create a curve table for the sidewalk edge curves on the Northern end of the project.

- From the **Annotate** menu > **Line/Curve Table** > select **Curve Table**. Note the command prompt:

Select curve [Points/<select arc or polyline>]:

Select the arc on the left edge.

- Now you are prompted to enter the curve number:

Curve number <1>:

Press **Enter** to accept the entry.

- Now you are prompted for the starting point for the table.

Starting point or point number of curve table (Enter for none):

Graphically pick a point to the east of the linework. Notice how the table with the information for the first line will be placed.

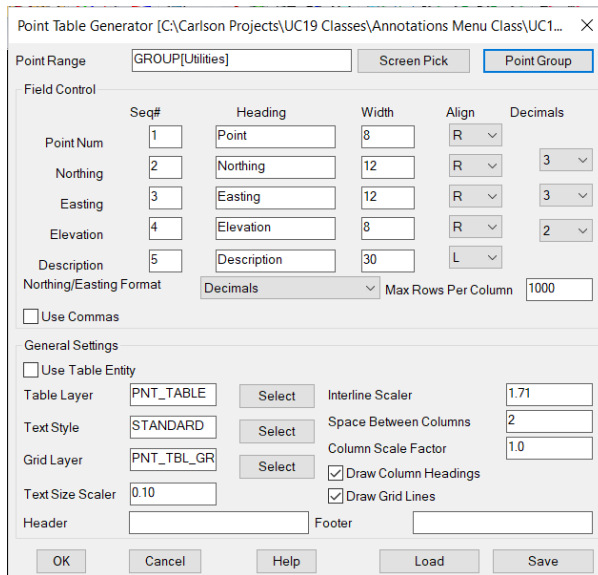
- You are now prompted to select the next curve. Select the second arc, you can accept the curve number by pressing **Enter** and the second curve will be added to the table.
- Press **Enter** to complete the command.



Point Table

Now that you have learned how to create line and curve tables, let's create a point table listing the light pole(s) and electric box(es) in the drawing. We will take advantage of the fact that this drawing has an associated CRD file (Carlson coordinate file) and that a point group has already been created.

- From the **Annotate** menu > then **Point Table** > select **Create Point Table**.



Point Table Generator [C:\Carlson Projects\UC19 Classes\Annotations Menu Class\UC1...

Point Range:

Field Control

	Seq#	Heading	Width	Align	Decimals
Point Num	1	Point	8	R	
Northing	2	Northing	12	R	3
Easting	3	Easting	12	R	3
Elevation	4	Elevation	8	R	2
Description	5	Description	30	L	

Northing/Easting Format: Max Rows Per Column:

☐ Use Commas

General Settings

☐ Use Table Entity

Table Layer: Interline Scaler:

Text Style: Space Between Columns:

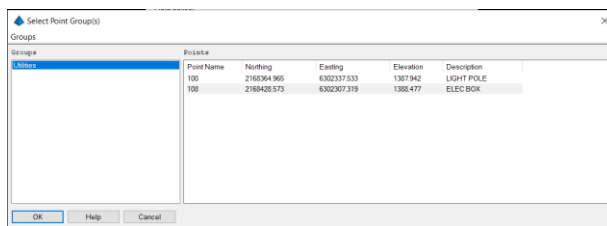
Grid Layer: Column Scale Factor:

Text Size Scaler: ☒ Draw Column Headings

☒ Draw Grid Lines

Header: Footer:

- Click on **Point Group** and select the **Utilities** point group and click **OK**.



Select Point Group(s)

Groups

Point Name	Northing	Easting	Elevation	Description
100	2160364.965	6302337.533	1387.942	LIGHT POLE
108	2160428.573	6302307.319	1388.477	ELEC BOX

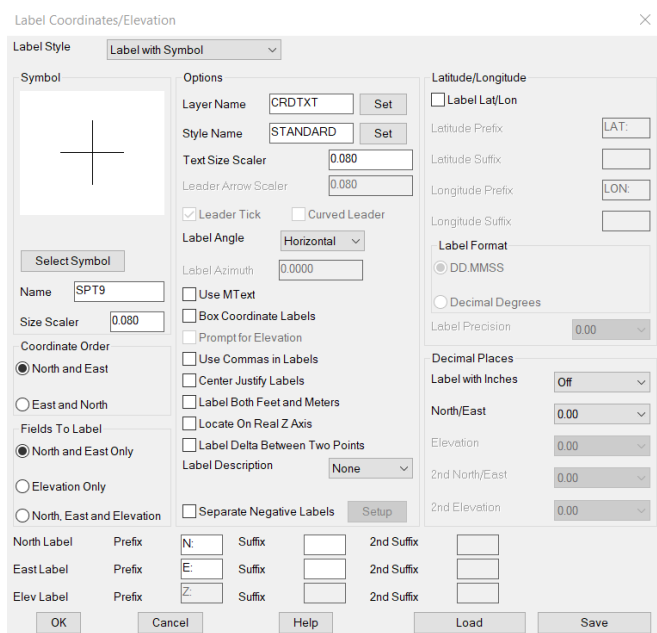
- We will keep all the default settings but, as you are already noticing, these settings can be saved into a configuration file.
- Click **OK** and you will be prompted to graphically select the starting point for the table. Click a point toward the southeast in the drawing and the table will be created.

Coordinate and Lat/Long Labels

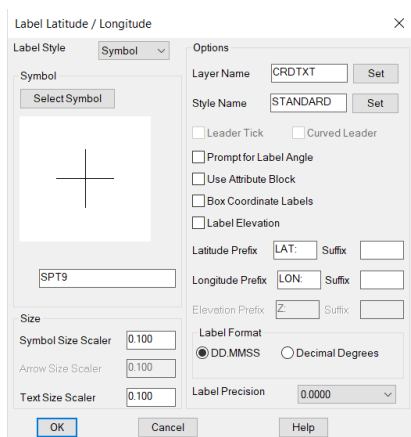
A useful tool as you develop the map is the ability to annotate coordinates in a northing/easting or lat/long format anywhere in the drawing. Let's do both:



- From the **Annotate** menu > select **Label Coordinates/Elevation**.



- We will **Label with Symbol** and keep **North and East Only** as the *Fields to Label*.
- Click **OK**.
- Pick a point on screen and the Northing/Easting will be labeled.
- From the **Annotate** menu > select **Label Lat/Long**.



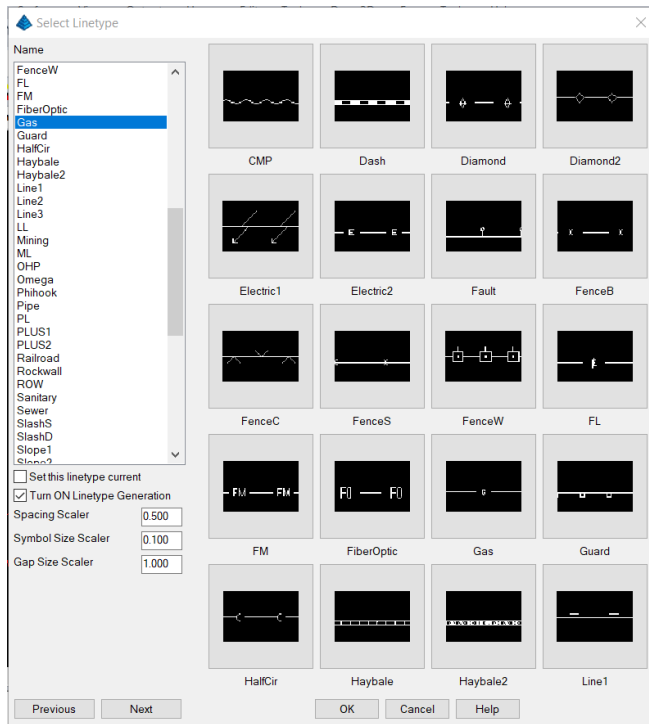
- Keep all the defaults and click **OK**.
- Pick a point on screen and the Latitude/Longitude will be labeled.
 - Comment: This project is localized to California Zone 6.*



Annotate Line Types

As you continue developing your map, another useful tool is the *Change Polyline Linetype* routine. This command changes the linetype of lines and polylines to a new linetype that can be selected from the dialog.

- Let's start by drawing a new line. In CAD type **L** and draw a line parallel to any of the lot lines by 15 feet offset. Don't worry if it's not perfect, this is a training file.
- From the **Annotate** menu > select **Line Types** > then **Change Polyline Linetype**.



- We will make the line you just drew a **Gas** line. You can use the scroll bar on the left to select Gas or click the *Previous* and *Next* buttons to view the linetype previews.
- Click **OK** and then select the line(s) that you will change.
- Press **Enter** to complete the selection set and Carlson will change the linetype.
 - *Comment: Changing linetypes in this way, adjusts the individual entity or entities linetype this is not a Bylayer method. If you are following drawing standards, you may want to assign the linetype property to the layer and keep all entities in the layer to Bylayer.*

General Annotations

As you were annotating the lines and curves, you might have noticed a few text placement options too.

- From the **Annotate** menu > select **Survey Text** > then **Adjoiner Text**. This routine will align the text you want to place to the direction of a line.
- Select the gas line.



- When prompted for the starting point, snap to the middle of the line.
- Type **GAS LINE** and press **Enter** to end the command.
Note that the text you entered is aligned to the selected line.
- The same can be done with curves, From the **Annotate** menu > select **Annotate Arc** > then **Draw Text on Arc**.
- Select one of the sidewalk arcs, then the position for the text and lastly type **Sidewalk**.

Let's get some dimensioning done on the building:

- From the **Annotate** menu > select **Survey Text** > then, **Offset Dimensions**.
Note the command prompt:

[end on] Pick Bldg/Object corner

If you hover the cursor over the building, you will note that the Endpoint snap is preselected. Go ahead and snap to the East corner of the building.

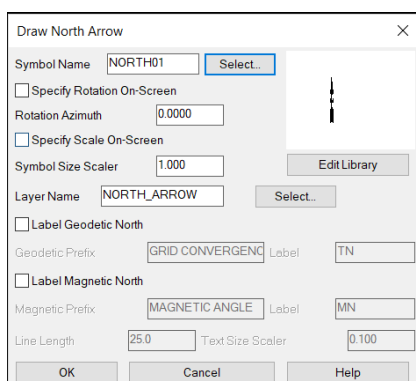
- Then, hover the cursor over the southeasterly lot boundary. Note how the Perpendicular snap is preselected. Click on any point of the lot line and the offset dimension will be placed.
- Repeat for other building corners.

Now, let's dimension the building:

- From the **Annotate** menu > select **Survey Text** > then, **Building Dimensions**.
- Pick the one of the building lines. Then, select the orientation. For example, snap to a line endpoint.
- Repeat until the building is dimensioned.
- Press **Enter** or **Esc** to end the command.

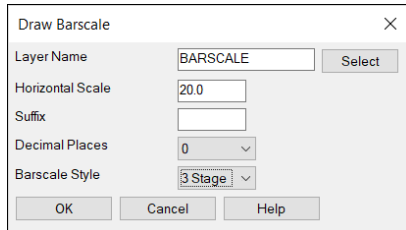
Lastly, to complete this lesson, let's add a North arrow and a bar scale to the drawing:

- From the **Annotate** menu > select **Draw North Arrow**.





- Click **Select** to display the library of North arrows. Then, click the thumbnail to select the one to your liking.
- Keep all the defaults and click **OK**.
- Insert the North arrow in the drawing.
- From the **Annotate** menu > select **Draw Barscale**.



- Select **3 Stage** from *Barscale Style* and click **OK**.
- Insert the barscale below the North arrow