

Creating Cross Sections Manually from Survey Notes

The following instructions will guide you through the process of drawing cross – sections from the surveyed data that represents the existing field conditions. This information would be obtained by using a level and field notebook. These instructions assume that the survey notes have already been reduced and that a new drawing has been opened. Carlson modules are displayed as {**Civil-Design**}, main menus are displayed as [**Sections**], and submenus and menu commands are displayed as <**Input – Edit Section File**>.

- 1) Go to: {**Civil-Design**} \implies [**Sections**] \implies <**Input – Edit Section File**>
- 2) The “**Section file to process**” dialog box opens on the screen.
- 3) Highlight the “**New**” tab and navigate to the job folder where the section file (.sct) will be saved and name the file. Click “**Open**”.
- 4) The “**Input – Edit Section File**” dialog box appears. At the top of this box, there are two buttons, 1st and 2nd. If the user had an existing and final section then they both could be drawn on the same grid. The file name that was given by the user appears next to the 1st button, while the 2nd button is blank.
- 5) To begin inputting the cross – section data for each station, go to the bottom of the “**Input – Edit Section File**” dialog box and in the Station to Edit field type in the station of the cross – section that is being entered. (i.e., 100 for 1+00) Then click “**Edit**”
- 6) Data will be entered under the following columns:
 - a. **Offset:** distance along the section
 - b. **Elevation:** recorded elevation from notes
 - c. **Description:** information about that location along the section
 - d. **Ratio:** slope ratio if going to design the section
 - e. **% Slope:** percent slope if going to design the section
- 7) Start entering the information for the station. Information that is input for distances left of the centerline shall be (-) values, and (+) values for all distances right of the centerline. Note: values with no sign are assumed to be (+).
- 8) Once the first station that is being input is complete, click “**Ok**”
- 9) Repeat steps 5 – 8 for the rest of the stations.
- 10) The **Input – Edit Section File** dialog box is open on the screen.
- 11) Once all sections are entered click the “**Save**” button. Then click the “**Exit**” button.

- 12) Draw the created section file: {**Civil-Design**} \implies [**Sections**] \implies <**Draw Section File**>
- 13) The **Section Files for Drawing** dialog box opens. The user can draw up to 6 different section files on the same grid and also has the option of assigning each one of those section files to its own layer. Also the layers for the grid lines and text may also be manipulated here as well.
- 14) Once all options have been selected click the “**Ok**” button.
- 15) The **Draw Section File** box opens. Here the user can manipulate the properties of the grid further. Click the “**Scan File to Set Defaults**” button. This will set the minimum elevation of the grid, the ranges of the station to draw, and set the right and left limits of the grid.
 - a. **Horizontal Scale:** Specify the horizontal scale.
 - b. **Vertical Scale:** Specify the vertical scale.
 - c. **Link Sections to Files:** Controls the linkage of plotted sections files. It determines how changes made to the (.sct) file affect the plotted section
 - i. **Off:** No linkage
 - ii. **On:** Prompt will ask whether to update the plotted sections when the (.sct) file changes.
 - iii. **Auto:** Automatically updates the plotted sections when file is changed
 - d. **Axis Text Size:** 0.125 – normal height. Specify the text size scaler for the axis text. This value is multiplied by the horizontal scale to obtain the final text height. For example, if you set Axis Text Size to 0.125 and the horizontal scale is 50.0, then the text height will be (0.125 X 50) or 6.25
 - e. **Type of Plot:** Choose between Vertical Stack, **Pick Location**, or Sheets
 - f. **Fit Each Vertical Grid:** The grid bottom elevation and grid height are set automatically and the user may specify values to add to the top and bottom of each grid
 - g. **Ranges of Stations to Draw:** If there just certain ranges of stations to be drawn enter them here, or type ALL for all stations in the file to be drawn.
 - h. **Interval of Stations to Draw:** Input the intervals of the stations (i.e., 20, 50, 100)
 - i. **Vertical Grid Adder to Top:** Specifies the distance that will be added to the highest elevation of the section for the sheets and pick location options. Only available when **Fit Each Vertical Grid** is checked on.
 - i. **Grid Bottom Elevation:** Specify actual bottom elevation for each section grid. Only available when **Fit Each Vertical Grid** is checked OFF.

- j. **Station Text Size:** 0.25 – title height. Specify the text size scaler for the station text label. This value is multiplied by the horizontal scale to obtain the final text height. For example, if you set Station Text Size to 0.25 and the horizontal scale is 100.0, then the text height will be (0.25 X 100) or 25.0
 - k. **Vertical Grid Adder to Bottom:** Specify the distance that will be subtracted from the lowest elevation of the section for the sheets and pick location options. Only available when **Fit Each Vertical Grid** is checked on.
 - i. **Vertical Grid Height:** Specify actual grid height for each section grid. Only available when **Fit Each Vertical Grid** is checked OFF.
 - l. **Vertical Space Between Grids:** Specify the distance the sections are stacked above the last one plotted when drawing multiple sections.
 - m. **Draw Elev at Zero Offset:** Labels the section elevation at offset zero. The label is drawn on the section grid just above the section line.
 - n. **Draw Break Pt. Elevations:** Labels all break point elevations along the section line above each point in a section.
 - o. **Draw Break Pt. Offsets:** Labels the offset distance from zero of each break point along the section.
 - p. **Draw Break Pt. Descriptions:** Labels the descriptions of your break points if any exists.
 - q. **Draw Slopes:** Labels the slope ratio above the section line.
 - r. **Label End Areas:** Labels the end areas if there was an existing and final grade section plotted on the same section. Click the Set button to the right of this toggle to set the display precision, text size scaler and layer for these labels
 - s. **Circle Station Label:** Will draw the station number with a circle around it on the left and right sides of the section grid.
- 16) Click the **Set** button to the right of these toggles to set the display precision, text size scaler and layers for these labels.
 - 17) Now set the horizontal and vertical scales of the section file, the horizontal axis spacing
 - 18) Under the **Grid Line/Text Drawing Controls**, the user can adjust the right and left grid limits for the section grids. Also, the user has the option to plot the just the section line by selecting the Plot Grid option or plotting the section line and the text by selecting Text only.
 - 19) The Horizontal Axis Spacing Grid specifies the distance the vertical lines of the grid will be spaced.
 - 20) The Horizontal Axis Spacing Text specifies the interval that the text will be plotted. (labeling of stations)

- 21) The Vertical Axis Spacing Grid specifies the distance the horizontal lines of the grid will be spaced.
- 22) The Vertical Axis Spacing Text specifies the interval that text will be plotted to the left and right of the grid lines. (labeling of elevations)
- 23) Once all options have been selected click the “**Ok**” button.
- 24) If the type plot selected was **Vertical Stack**, the command prompts will be as follows:
 - a. Select Starting Point for Row of Sections: **Screen Pick the Point**
- 25) The stack of cross – section grids are now drawn on the screen.

Other Cross – Section Plotting Types

- 1) If the type plot selected was **Pick Location**, the command prompts will be as follows:
 - a. Change datum elev/<Select point that represents 0 offset elev>:
Screen Pick Point
 - b. Repeat this for each station that needs to drawn.
- 2) Once all the grids are drawn the command will exit.
- 3) If the type plot selected was **Sheets**, the Section File Sheet Drafting Parameters box opens on the screen.
 - c. **Block Name:** Specify the AutoCAD drawing name that will be inserted for each sheet. The default is SCTSHT1 which is included with SurvCADD, and is stored in the \SUP directory. You can use this or use a sheet block of your own design. The block should be drawn at a 1 = 1 scale since the program inserts it at the horizontal scale setting from the previous dialog.
 - d. **Distance Between:** Controls the distance from the bottom of one sheet and the bottom of the next.
 - e. **Sheet Width (in.):** Enter the width of the sheet being used
 - f. **Sheet Height (in.):** Enter the height of the sheet being used
 - g. **Lower Left of Sheet to CL:** X and Y edit boxes allows the user to specify where the first section of the first row will be placed relative to the lower left of the section sheet.
 - i. **X:**
 - ii. **Y:**
 - h. **Rows of Sections**
 - i. **Per Sheet:** Controls how many sections will be stacked on top of each other on a sheet.

- ii. **Distance Between:** Controls how much space will be placed between the top of the last section plotted and the bottom of the next section.
- i. **Columns of Sections**
 - i. **Per Sheet:** Controls how many rows of sections will be plotted on each sheet.
 - ii. **Distance Between:** Controls the distance that the rows of section will have between the centerline of the one section row and the next centerline of rows.
- 4) Once all options have been selected and changed click the “**Ok**” button.
- 5) In the command line the user is prompted as follows:
 - a. Select Starting Point for Row of Sheets: **Screen Pick the Location for the sheets.**
- 6) The cross – section sheets are now drawn on the grid.