CADD NOTE 10

The purpose of this CADD Note is to provide instructions for generating an elevation-area or elevation-storage table. The table is generated from contour lines selected by the user. The table can be inserted into the drawing, printed, or saved to a file.

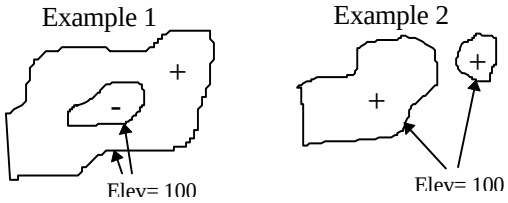
USING THE AREA TABLE COMMAND

Before using this command, the current settings for color and text style should be set as desired. The table will be created using these current settings. To use the area table command in AutoCAD, use one of the following methods:

MENU: **NRCS_MO, Tables, Area Table...** COMMAND: **areatable** ICON: 

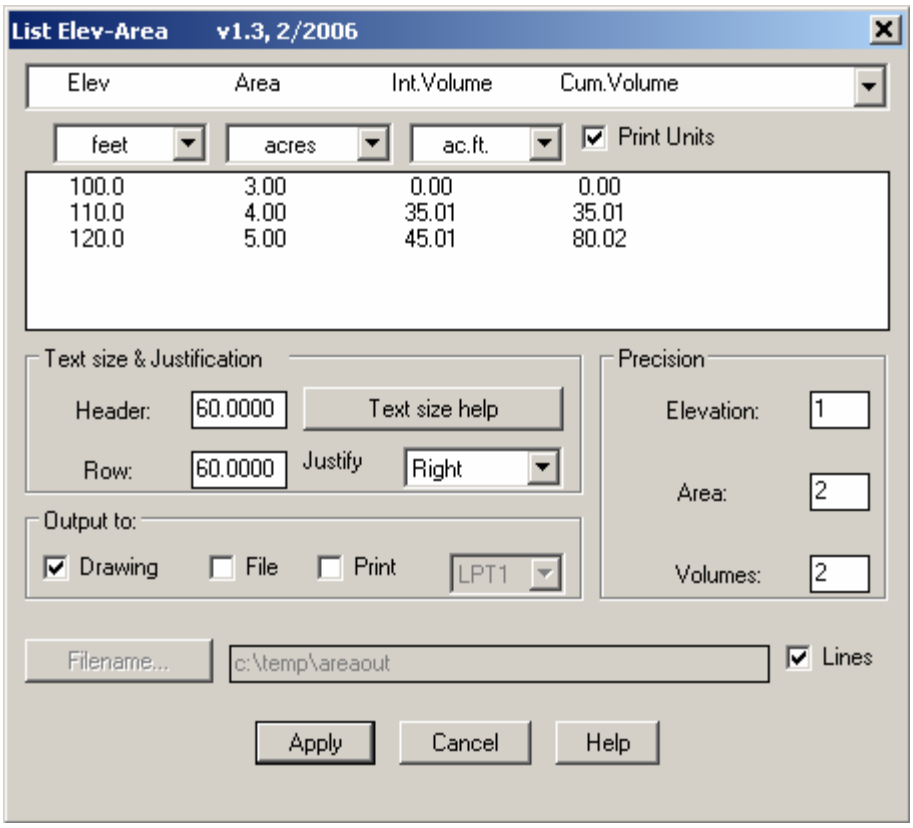
Follow the steps below:

1. Select the desired contour lines (2D polylines with an elevation) using normal AutoCAD selection techniques. The lines should be closed. If not closed, the program assumes a line is drawn from the first point to the last point of the polyline.
   NOTE: If two or more polylines with the same elevation are selected, the program will stop at each of the lines and prompt the user as follows:
   Multiple elev. = ### Area = ###
   Enter + to add or - to subtract area <+>
   You should enter a + or -. Normally, if a contour line encompassing a small area is within the area encompassed by a contour line with the same elevation, you would subtract the smaller area (see example 1 sketch below). If the areas are separated, the areas would be added (see example 2 sketch below).



2. The dialog box shown below will appear.

AREA TABLE



3. From the popup list at the top, select the desired combination of columns you wish to have in the table. The columns to choose from are elevation, area, interval volume, and cumulative volume.
4. From the popup lists, select the units to use for elevation, area, and volumes. NOTE: If feet are chosen for elevations, the program assumes that one drawing unit is equal to one foot. If meters are chosen, one drawing unit equals one meter.
5. If you want the units listed as the second row of the table, make sure the *Print Units* box is checked.
6. The middle section of the dialog box displays the results of the area and volume calculations along with the associated elevation (see Computations section). The elevations are sorted in ascending order.
7. Enter the text sizes for the header (first) row and for the remaining rows. If you need help in determining the correct text size to enter, click on the [Text size help] button. This will run the SETTEXT command.
8. Select the desired justification.
9. Enter the precision (number of decimals places) for elevation, area, and volume values.
10. Check the box or boxes of the output options desired.
    Drawing - Inserts the table into your drawing as a block.
    File - Writes the table out to the filename specified at the bottom of the dialog box.
    Print - Outputs the table to the port specified in the popup list.
11. If *File* output was chosen, enter a filename or use the [*Filename...*] button to select an existing file.

11. Check if you want lines (borders) drawn with the table (This only affects the table in the drawing).
13. Select *Apply* .
    If *Drawing* was selected, you will need to place the table by selecting an insertion point. The table will be a block that can be selected as one entity. The insertion point of the table will be the upper left corner of the table and will be placed on layer *1.Area.Tabl* in model space or *2.Area.Tabl* in paper space.
    If *File* was selected, the table will be written to the entered filename.
    If *Print* was selected, the table will be sent to the printer.

SAMPLE TABLE

Shown below is a sample table that would be generated in the drawing from the settings in the dialog box shown above.

Elevation	Area	Int.Volume	Cum.Volume
feet	acres	ac.ft.	ac.ft.
100.0	3.00	0.00	0.00
110.0	4.00	35.01	35.01
120.0	5.00	45.01	80.02

TECHNICAL INFORMATION

COMPUTATIONS

The program derives the elevation-area-volume table using the following procedure.

1. Contour lines are selected.
2. Lines are sorted into ascending elevation order.
3. Compute areas for each line using AutoCAD's AREA command.
4. Convert computed area to appropriate units.
5. Duplicate elevations are checked.
   a. If duplicates are found, prompt for adding to or subtracting from total area for that elevation.
6. Set cumulative volume to 0.
7. Compute the interval volume between each elevation using the average end area method.

$$Volume = \frac{(area1 + area2)}{2} * \left| (elevation1 - elevation2) \right|$$

8. Add the interval volume to the cumulative volume.

AREA TABLE

HEADER FILE

For a table inserted into the drawing, the file AREATBL.HDR can be used to include extra lines at the top of the table or to adjust the width and justification of each column.

The format of the file should be a line for each row and comma separated values for each column. To include a comma as text, use double quotes ("") to surround the desired text including the comma (e.g., "Smith, John"). The number of columns should match the number of columns selected in the first drop down list. This will normally be 4 (Elev, Area, Int.Volume, and Cum.Volume). If a row has anything different than this number, you will get an error message.

Lines beginning with a semicolon are considered comments.

To specify different alignments for each column, enter the line

JUSTIFY=L,C,C,R

at the beginning of the file (where L=left, C=center, R=right). This will override anything entered in the dialog box. Justification for individual cells can also be specified. Do this by entering [L], [C], or [R] as the first part of the text (e.g., [C]Apples,red,[R]juicy).

To specify different column widths, enter the line

WIDTH=0,10,15,0

at the beginning of the file. The values denote number of characters. 0 indicates that width should be computed.

The top gridline for a cell can be omitted by entering [-] as the first part of the text (e.g., [-]No top line). To combine justification with this option, specify the letter first (e.g., [C-]).