

**Computer Aided  
Survey Tools 3  
(CAST3)**

**USER MANUAL  
Version 1.0**

# Computer Aided Survey Tools 3 (CAST3) User Manual - 2015

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## Introduction

Computer Aided Survey Tools 3 (CAST3) is a collection of CAD routines that simplifies the drafting of professional survey drawings. Together with the range of CAD products, it is a must-have, inexpensive, and highly productive drafting tool for all Land Survey professionals.

### Basic listing of CAST3 functions.

- CASTools uses the industry standards drop down menu.
- Selectable plotting scale, text height, decimal selection for area and distance text
- Housing plan layout made easier with CAST3's smarter *offset* function
- Auto bearing and distance labeling for lines
- Able to stretch and rotate the bearing label to your liking
- Auto Lot numbering and Auto Area labeling.
- Auto boundary marks symbols and precomp layout road width labeling.
- Text Coordinate label.
- Survey line traverse plotting and survey line radiate from station
- Automated drawing of the cutting symbol in AutoCAD
- Cross Section plotting
- And many other tools to ease the laborious ways of the past are included

### System requirements

These CAST3 are designed to support only Autocad R14, Autocad 2000 to Autodesk 2015 and ZWCAD 2015+.. The support covers above-mentioned versions of CAD designed for the Windows operating systems compatible with **Windows 98, 2000, WinXP Pro, Windows 7 to Windows 8**

## 1.1. Module 1: Cast3 Menu

To activate Cast3 Functions.

1. From the menu bar, choose Cast3 [Settings]
2. Choose [ Load Cast3 ]

### To set a scale

1. From the Cast3 menu bar, choose [Settings]
2. Choose [Set Scale]

```
Command: (C:td_setscale)
*Cancel*
Command:
Command:
Please enter new scale value <1000.0000> :
```

3. Enter the new scale value and press [Enter]. (Note: The default value is 1000)

### To set Line Space

1. From Cast3 menu, choose Set Line Space
2. On the Command line, enter the new value of line spacing or press Enter to accept the current default.

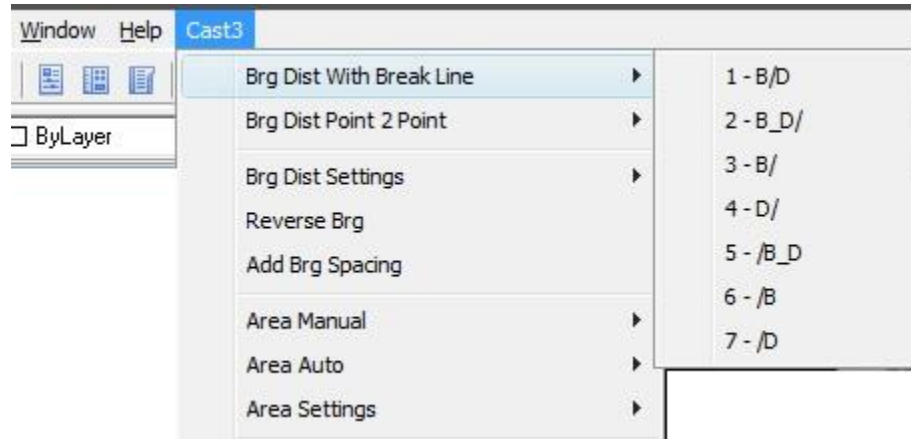
### To set font height

1. From the menu bar, choose Cast3 [Settings]
2. Choose [Set Font Height]
3. On the command line enter the font height for a new default value and then press Enter.

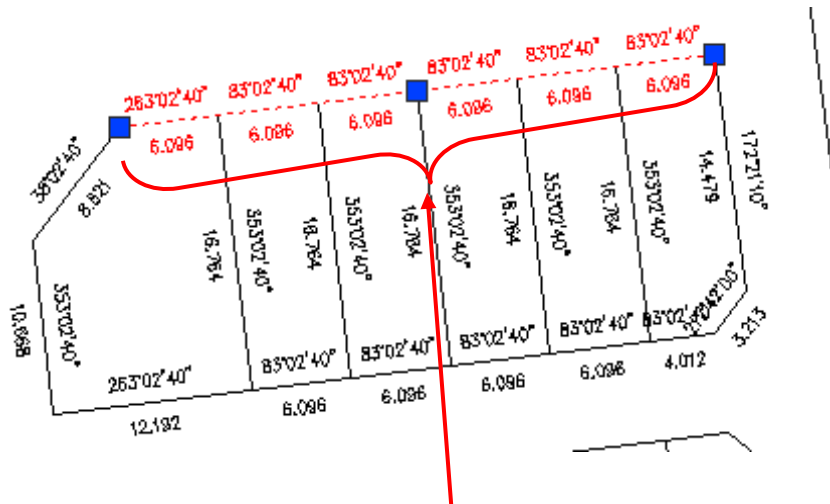
## 1.2. Bearing Distance With Break Line

Function description: This function automatically breaks the single line to multiple lines (break for every intersect) to display the detailed bearing and distance for selected object but still remained the single line.

1. From the Cast3 menu, choose [**Brg Dist With Break Line**]. Then choose the style from [Brg Dist With Break Line] sub menu. Then click the style to choose it.



Select Objects and then right click (see illustration below)

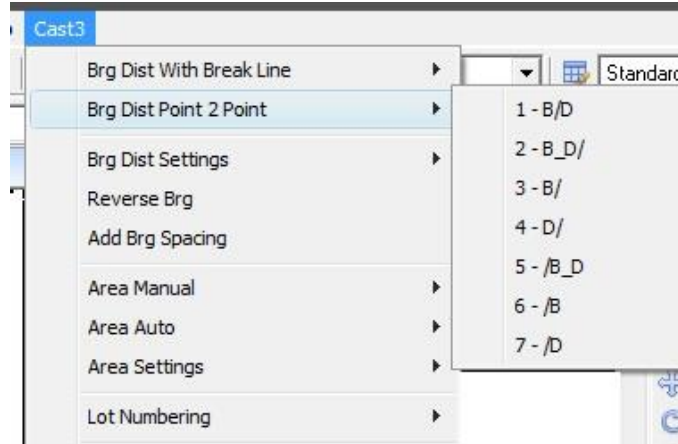


Display all the bearing and distance for every intersect

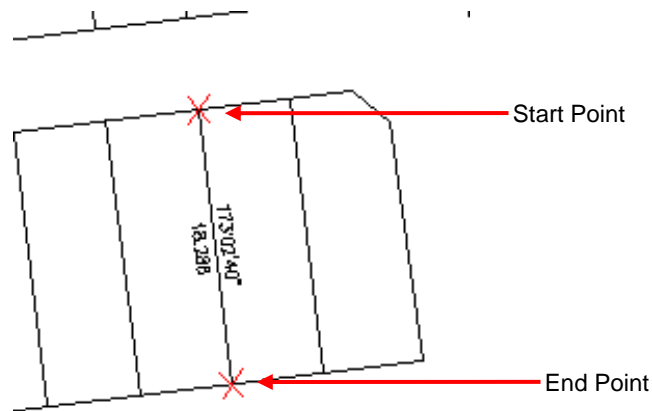
### 1.3. Bearing Distance Point to Point

Function Description: To show the bearing and distance by pointing the start and end point of line.

1. From the Cast3 menu, choose [ **Brg Dist Point 2 Point** ]



2. Choose the style from [Brg Dist Point 2 Point] sub menu. Then click the style to choose it.
3. Pick the start and end point of path (as shown in illustration below)

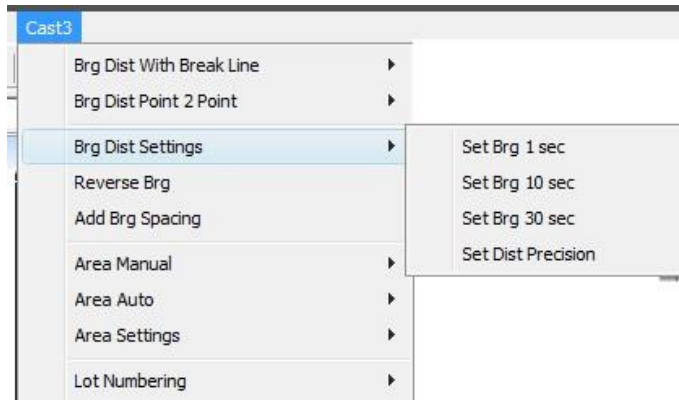


Example Output using B/D style

## 1.4. Bearing Distance Settings

Function Description: to set bearing distance accuracy.

1. From the Cast3 menu, choose [Brg Dist Settings]



2. Choose the set bearing from [Brg Dist Settings] sub menu and click the setting selection
  - Set Brg 1 sec: Precomp bearing accuracy is 1 second
  - Set Brg 10 sec: Precomp bearing accuracy is 10 second
  - Set Brg 30 sec: Precomp bearing accuracy is 30 second
  - Set Dist Precision: To set the new distance precision (enter the new distance value and press Enter)

## 1.5. Reverse Bearing

Function Description: to reverse an existing bearing by selection

1. From Cast3 Menu, choose [Reverse Brg]
2. Select bearing to reverse and then right click mouse button (the bearing automatically reverse)



3. Repeat step 2 to reverse another bearing.
4. Press Esc button or right click mouse button to deactivate the function.



## 1.6. Add Bearing Spacing

Function Description: to add an existing bearing spacing

1. From the Cast3 menu, choose **[Add Brg Spacing]**
2. Select objects and then right click mouse button.  
(Note: you can select more than one)
3. Enter the number of spacing and press [Enter]

Select objects: 1 found  
Select objects:

**+ NUMBER** FOR MORE SPACE OR **- NUMBER** FOR LESS SPACE:

↑  
o increase spacing

↑  
To reduce spacig

Example

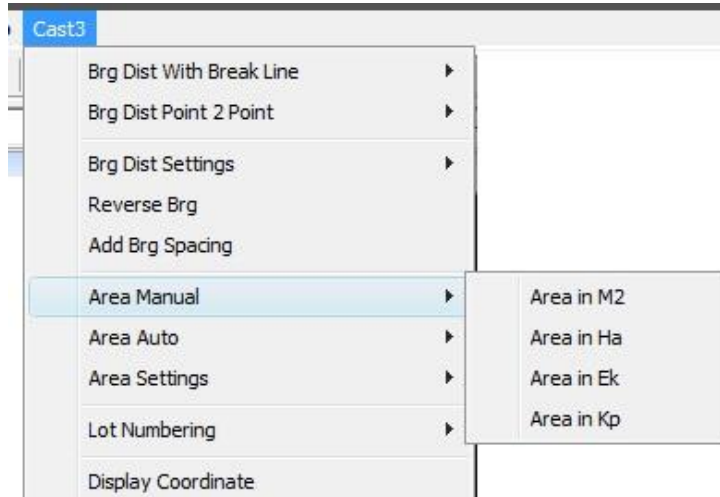


4. Press Esc or double right mouse button to deactivate the function.

## 1.7. Area Manual

Function Description: to display the area of closed polygon with the selected units by click the area one by one

1. From the Cast3 menu, choose Area and area unit from [Area] sub menu.  
Then click selected area unit



2. The command window will display a display format and prompt you to confirm boundary selection:

```
Command:  
Display format [ m2 | Ha | Ek | Kp ] <m2>: 1  
Ask to confirm boundary selection? [ y | n ] <y>
```

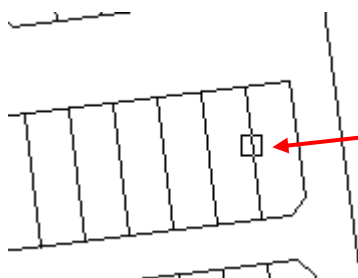
If the user choose area unit in meter square

Current value

3. Under *Ask to confirm boundary selection*, type “y” if you confirm the boundary selection and type “n” if you not confirm the boundary selection then press **[Enter]**

```
Command:  
Display format [ m2 | Ha | Ek | Kp ] <m2>: 1  
Ask to confirm boundary selection? [ y | n ] <n>: y  
Please select a line to align text to <172.4d>
```

4. The window command will prompt you to select a line to align text.  
Select a line (see example below)

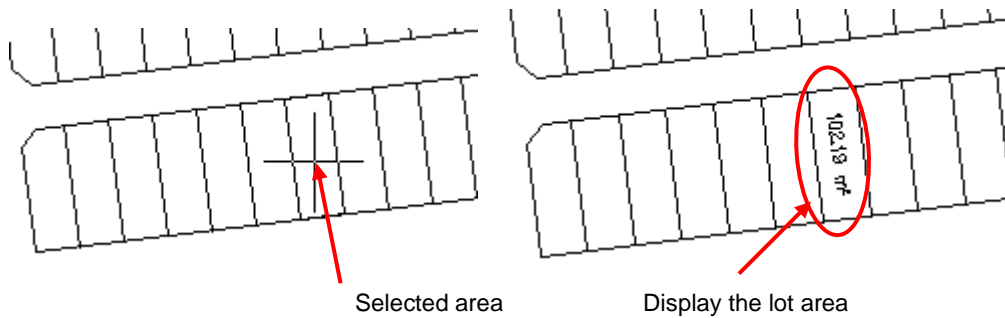


Cursor changes from crosshairs to square box (pick box) to select objects.

- The current text alignment angle will display automatically in your window command and at the same time ask the user to select an area.

```
Ask to confirm boundary selection? [ y | n ] <y>:  
Please select a line to align text to <83.0d>:  
Current text alignment angle: 173.0d  
Please select an area or cancel:
```

- Select the area by clicking inside the polygon. At the *Is the area selected correct?* [Y| n] <y>: prompt, type “y” or “n” and then press [Enter].
  - “y” (yes) - if the area selected is correct
  - “n” (no) - if you not sure the area

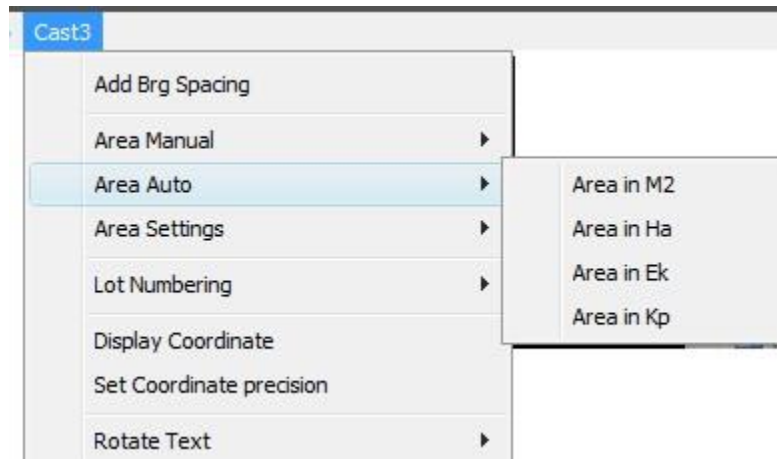


- Repeat steps 4 to 6 to continue or press ESC to cancel the command.

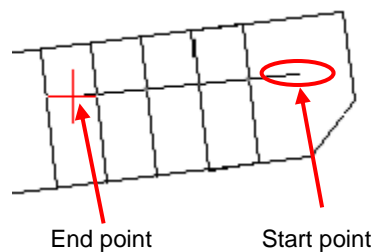
## 1.8. Area Auto

Function description: to display the area of closed polygon automatically by setting starting to end point

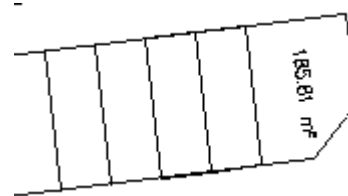
1. From the Cast3 menu, choose Auto Area and area unit from [Area Auto] sub menu. Then click the unit



2. At the *Ask to confirm boundary selection? [y | n] <current>*: prompt, type 'y' and then press [Enter]
3. The window command will prompt you to select a line to align text. Click one line to select a text alignment angle.
4. Pick a starting and end point.



Example: Pick a start and end point



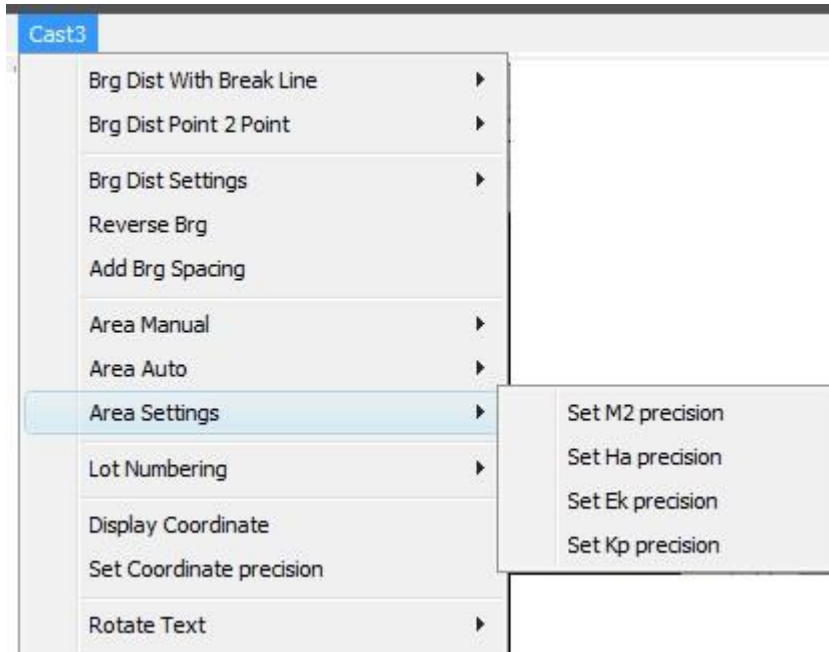
Example: Result

5. At the *"Is the area selected correct? [y | n] <current>* " prompt, type 'y' and press [Enter]
6. Repeat step 5 until finish.
7. If you type 'n' at step 2, all the area of polygon within in selected area were display automatically after you did a step 4.

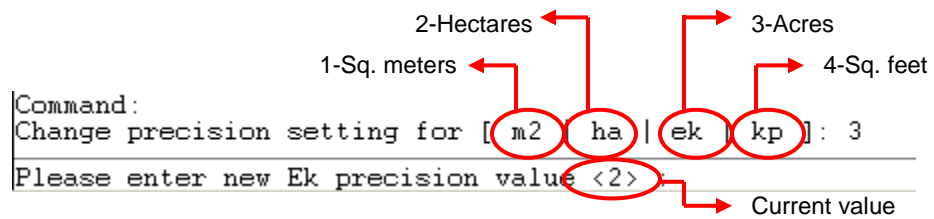
## 1.9. Area Settings

Function description: to setup area decimal places.

1. From the Cast3 menu, choose Area Settings and Set unit precision from [Area Settings] sub menu. Then click selected Set unit precision.



2. The command window will prompt you to enter the new unit precision value



Note: Default setting is taken from previous setting.

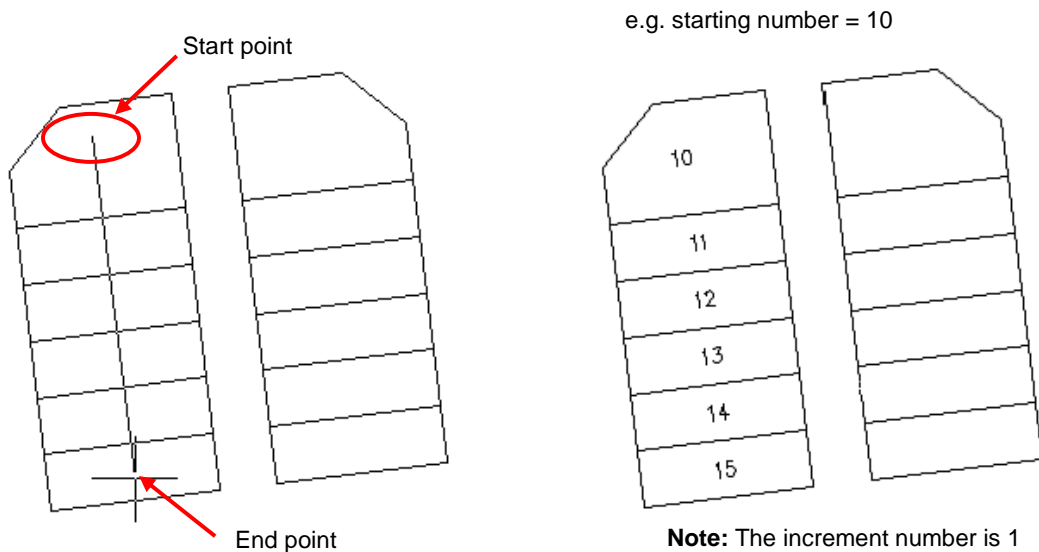
3. Enter the new value or press enter to accept the default value.

## 1.10. Lot Numbering

### Lot Mid Point Numbering Auto

Function description: to generate auto numbering by specifying the first number, start and end point

1. From **Cast3** menu, choose **Lot Numbering > Lot Mid Point Numbering Auto**
2. At ask confirm boundary selection? [ y | n ] <current> prompt, enter 'y' or 'n'. Then press Enter
  - Yes: the command window will prompt you whether the area selected is correct for every selected lot, if you enter 'y' the number will generated but if you enter 'n', it will skipped the lot and jump to the next lot.
  - No: the number will generated automatically base on the setting number you enter
3. At *Please enter the next lot number <current>*: prompt, enter the first lot number you want to set and then press Enter.  
Notice that the cursor change to square box called a pick box. With the pick box, you select the objects you want to copy, rotate, edit and so on.
4. At *Please select a line to align text to <current>* prompt, select the line.
5. Specify the starting point and end point inside the polygon as shown in illustration below.



6. Repeat steps 3 – 5 to continue or press Esc to cancel

## Lot Numbering Manual

Function description: to generate the number by picking a point manually.

1. From **Cast3** menu, choose **Lot Numbering > Lot Numbering Manual**
2. The command window will prompt you to specify the increment number (as shown in illustration below).

```
Command: num *Cancel*  
Autonumber [ +1 | +2 ] <Cancel>:
```

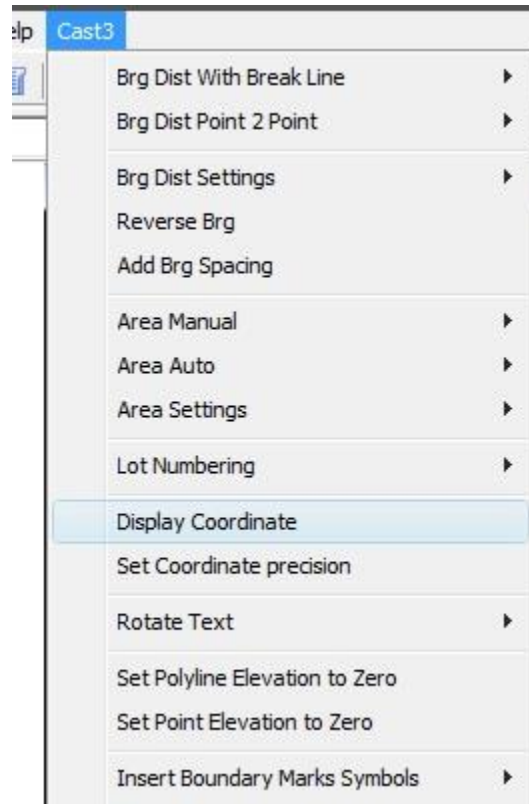
Note: + 1: increment number is one  
+ 2: increment number is two

3. On command line, enter the increment number and then press Enter.
4. At *Please enter starting value <current>* prompt, enter the starting number and press Enter.
5. At *Please select a point* prompt specify a point.
6. Repeat step 5 to continue and press Esc to cancel.

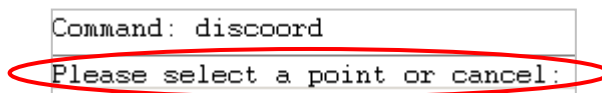
## 1.11. Display Coordinate

Function description: To display the coordinate

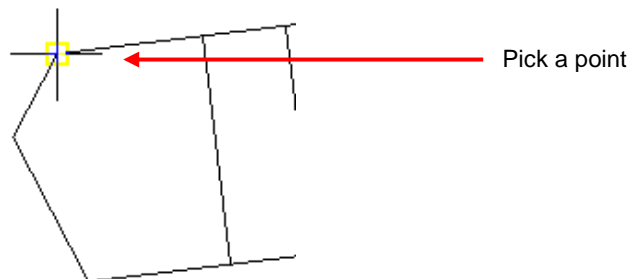
1. From the Cast3 menu, choose Display Coordinate.



2. The command window will prompt you to select point or cancel.

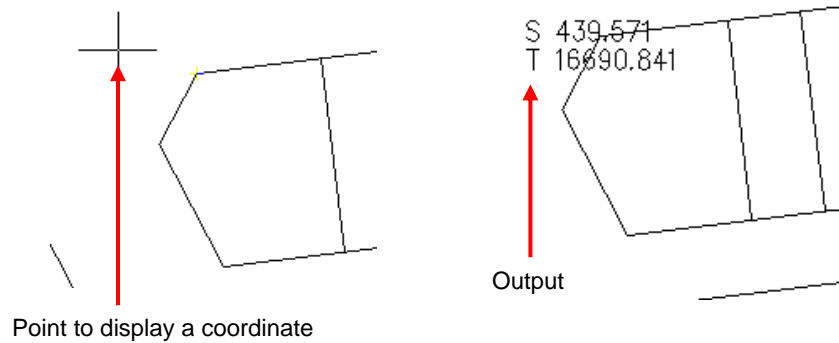


3. Pick a point and the command window will prompt you to select a display point.





- Pick point to display a coordinate. (See illustrations below)



- Repeat steps 2 to 4 to continue or press Esc to cancel.

### 1.12. Set Coordinate Precision

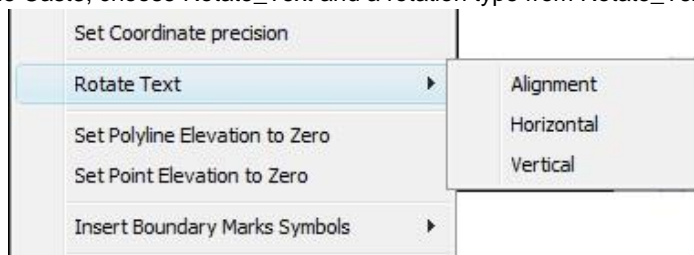
Function description: to setup coordinate decimal places.

- From the Cast3, choose Set Coordinate Precision.
- At the “*Please enter new coordinate precision value<current>:*” prompt, type a new value and press [Enter]

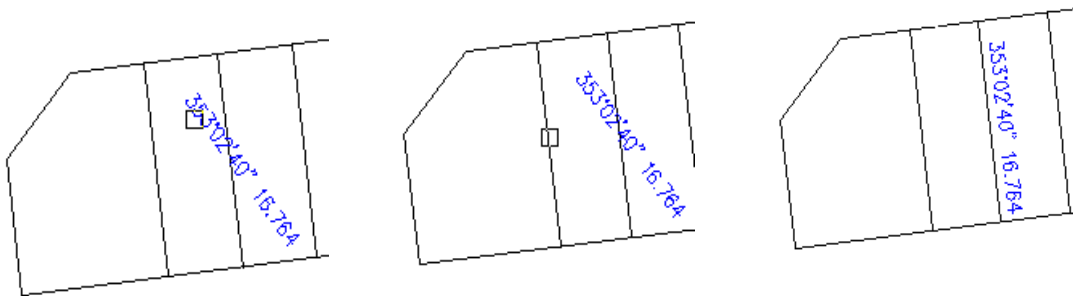
### 1.13. Rotate Text

Function description: to rotate the text

1. From the Cast3, choose Rotate\_Text and a rotation type from Rotate\_Text sub menu.



2. The command window will prompt you to select object
3. Select object and right click mouse button, the command window will prompt you to select object for base angle (see the example in illustrations below).



**Note:** This example for Rotate Text ► Alignment

4. At the *Specify base point or displacement* prompt; click the text and then click to specify displacement point.

### 1.14. Set Polyline Elevation to Zero

Function description: to set the Z value to zero (to convert 3D polyline to 2D polyline)

1. From the Cast3, choose Set Polyline Elevation to Zero.
2. Select objects and then press Enter
3. Example:

Illustration 1: Before set Polyline Elevation to zero

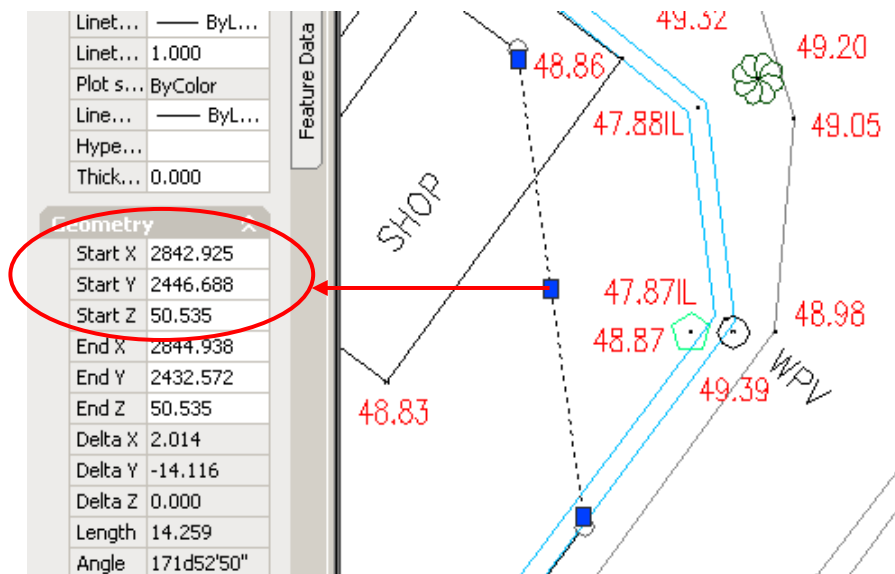
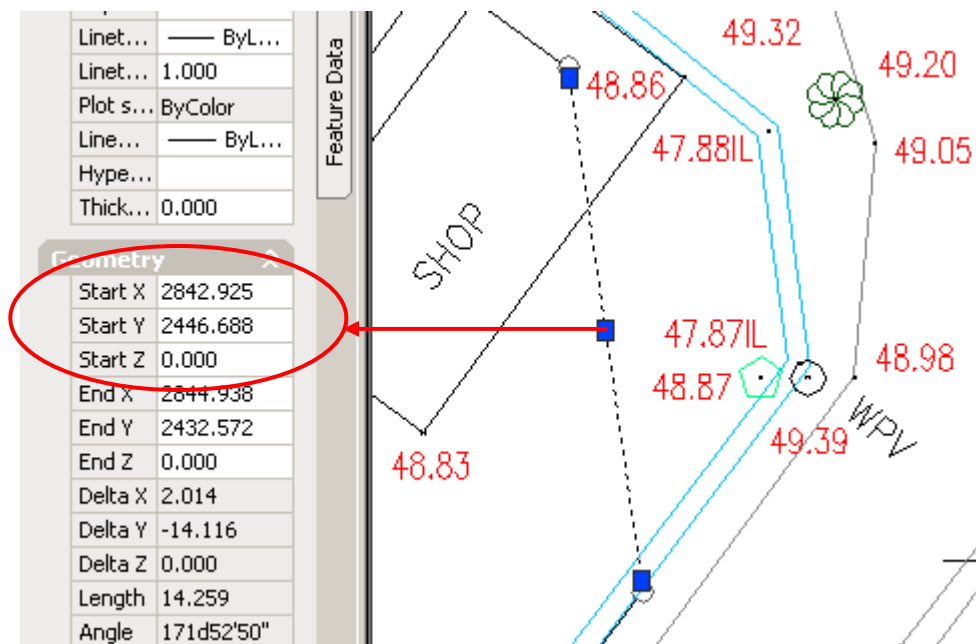


Illustration 2: After set Polyline Elevation to zero



### 1.15. Set Point Elevation to Zero

Function description: to set the **z** value to zero

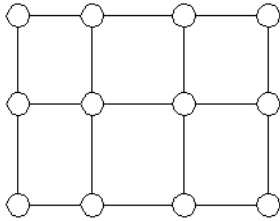
1. From the Cast3, choose Set Point Elevation to Zero
2. Select Objects and then right click mouse button or press Enter.

### 1.16. Insert Boundary Marks Symbols.

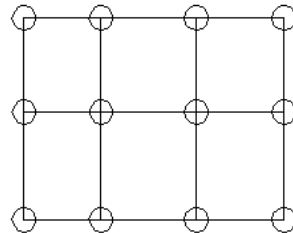
Function description: to insert boundary marks symbols.

1. From the Cast3, click Insert Boundary Marks Symbols ➤ choose one of the insert boundary marks option
2. Select objects (you can use any selection method) and then right click mouse button to insert the boundary marks.
3. If you chose Manual Insert boundary marks (with trim or without trim) in step 1, the window command will prompt you to select point. You need to select point one by one.
4. The following examples illustrate the different boundary mark symbol options.

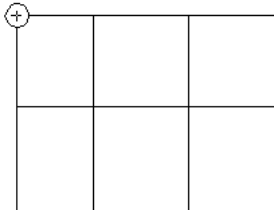
**Auto insert boundary marks with trim**



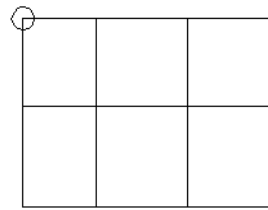
**Auto insert boundary marks without trim**



**Manual insert boundary mark with trim**



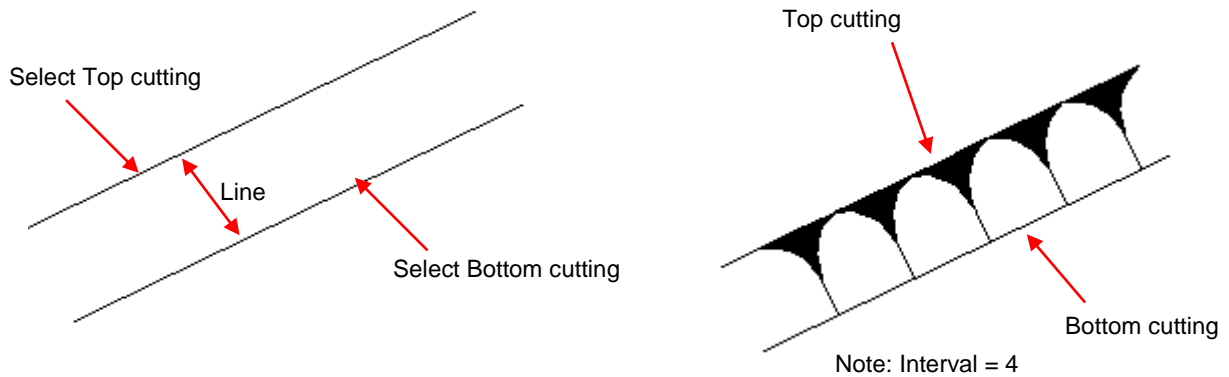
**Manual insert boundary mark without trim**



## 1.17. Cutting On Line Type

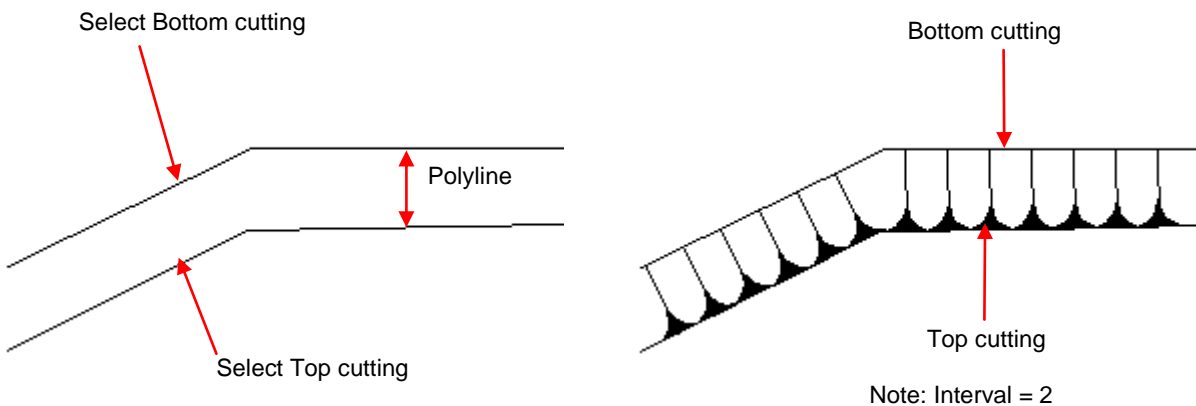
1. Select Cutting on Line Type
2. On command line enter the new interval value or presses enter to accept the current default value.
3. The command window will prompt you to select the top cutting >Select objects and then right click mouse button to proceed.
4. The command window will prompt you to select the bottom cutting >select objects and then right click mouse button.

### Example 1: Cutting on Line type



## 1.18. Cutting On Polyline Type

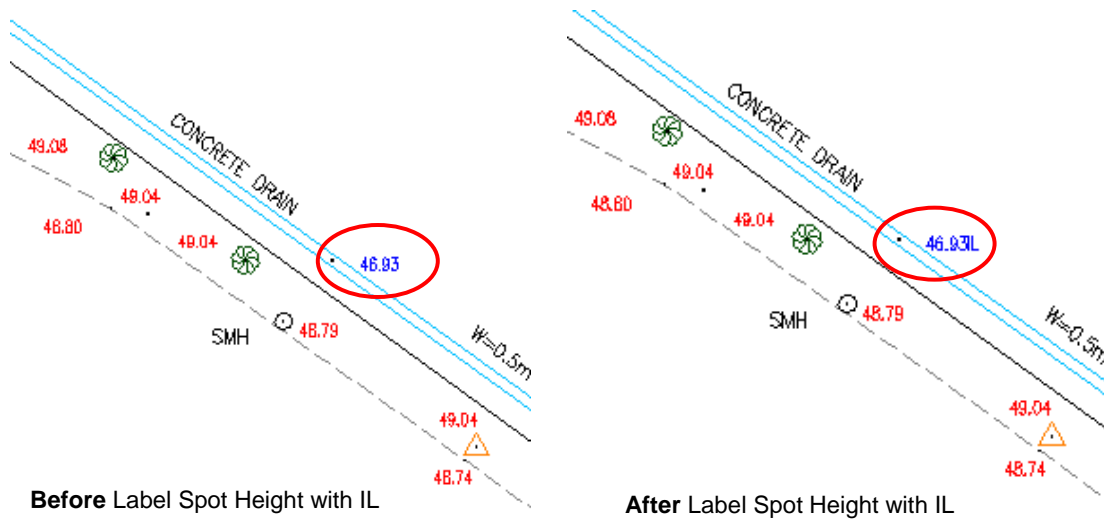
### Example 2: Cutting on Polyline type



### 1.19. Label Spot Height with IL

Function description: to label spot height invert level

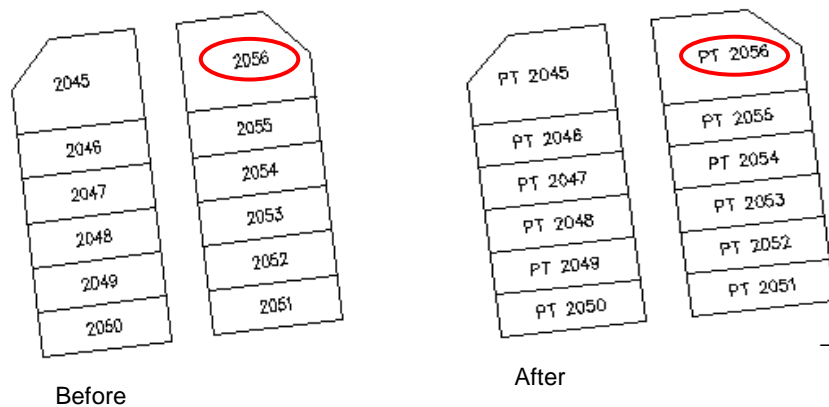
1. Choose Label Spot Height with IL
2. Select objects and then press Enter.
3. Example:



### 1.20. Label Lot Number

Function description: to label lot number with PT, PTD or PTB

1. Choose Label Lot Number > Label Lot Number With PT
2. Select objects and then right click mouse button or press Enter to complete the command.
3. Example:



Note: This example uses Label Lot Number with PT

## 1.21. Label Road Width

Function description: to label road width.

1. Choose Label Road Width

Label Road Width provides two type of label:

### Label Road Width Vertical:

- display label in vertical from select point.

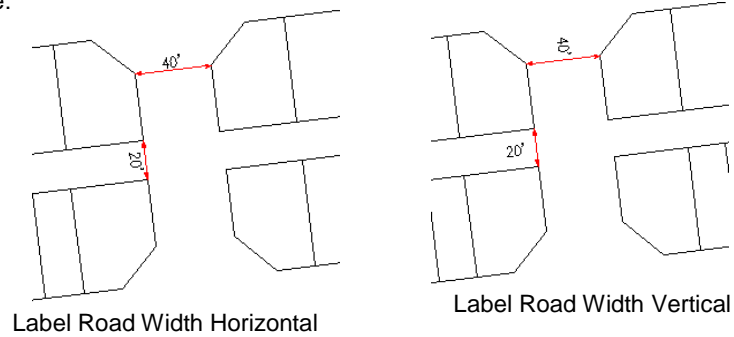
### Label Road Width Horizontal:

- display label in horizontal from select point.

2. Select unit

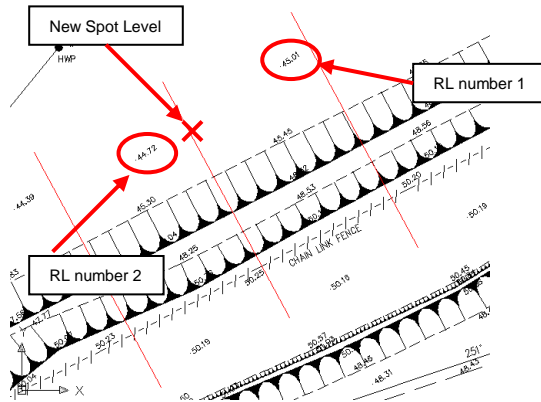
3. The command window will prompt you to specify the first line and second line.

Example:



4. Repeat step 3 to continue or press Esc to cancel.

## 1.22. Interpolate for Spot Level



### Steps

1. Pick two spot level 1 and 2
2. Then pick the cross-section line for the new intersecting spot level

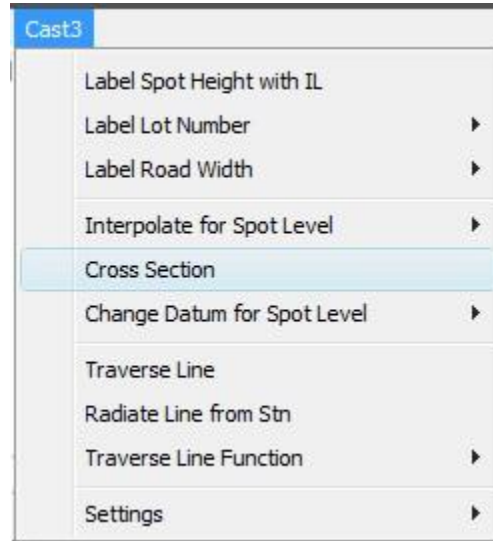
```
Command:
Command:
Command:
Please select: RL number 1:
TEXT 45.01
Please select: RL number 2:
208.0178,-20943.3003,0.0000 SNAP GRID ORTHO POLAR OSNAP
```



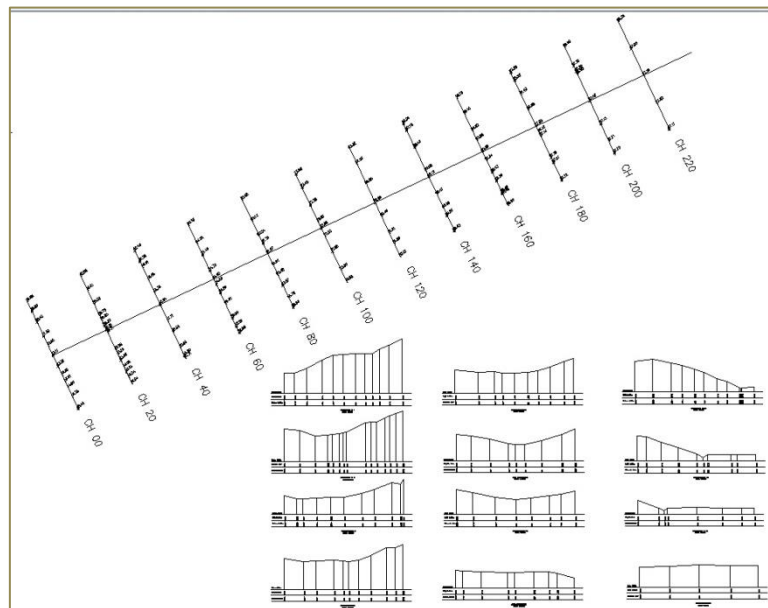
## 1.23. Cross Section

Plotting Cross Section profile.

1. Select **[CAST3 MENU] [CROSS SECTION]**



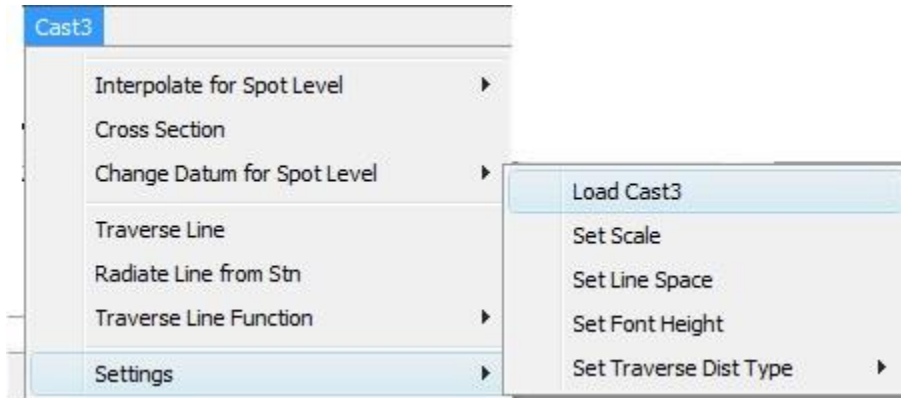
2. Sample Output Cross Section Profile



## Setup for Cross Section Profiling

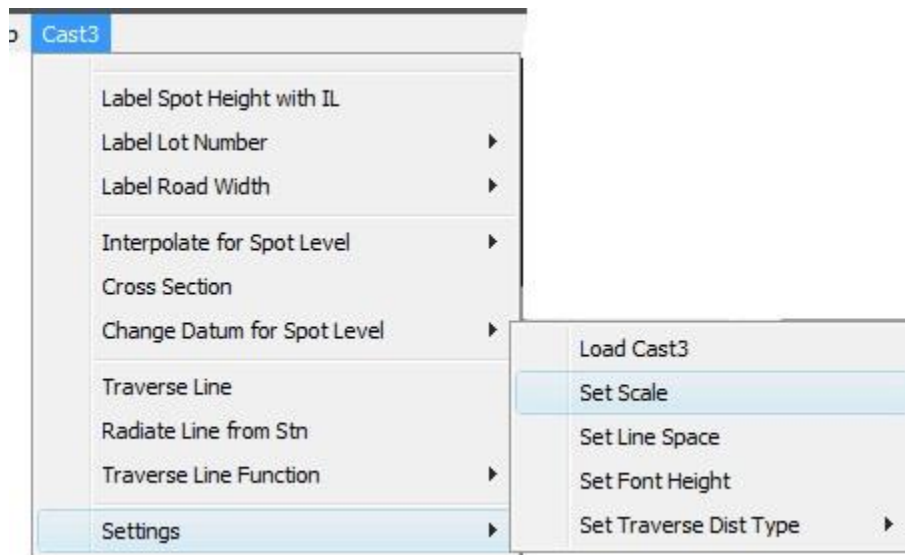
To activate Cast3 Cross Section Function.

1. From the menu bar, choose Cast3 **[SETTINGS]**
2. Choose **[LOAD CAST3]**



## Scale for Cross Section Profile

1. From the Cast3 menu bar, choose **[SETTINGS]**
2. Choose **[SET SCALE]**

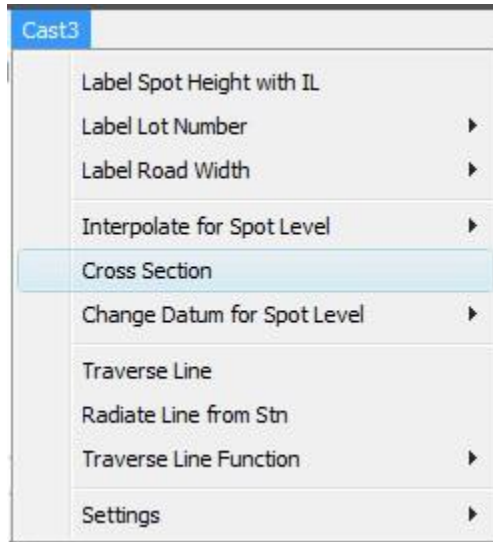


3. Enter the new scale value and press [Enter]. (Note: The default value is 1000)
4. Set new scale to **[200]**

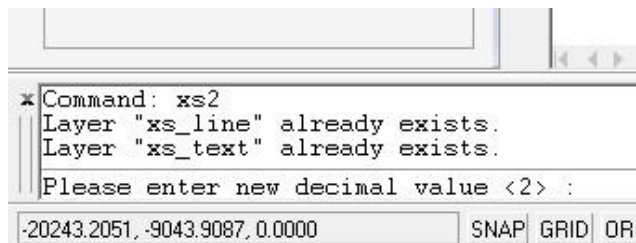
```
Command: (C:td_setscale)
*Cancel*
Command:
Command:
Please enter new scale value <1000.0000> :
```

### Cross Section Function

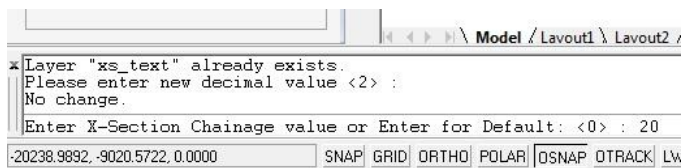
1. From the Cast3 menu, choose **[CROSS SECTION]**



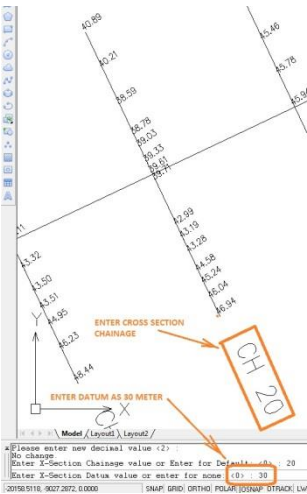
2. Function will create 2 new **LAYER** **[XS\_LINE]** and **[XS-TEXT]**
3. Prompt user to enter new decimal place for the HEIGHT, Default set to **[2]**
4. Press **[ENTER]** for default value



5. Next prompt user to input **[CHAINAGE]** or **[ENTER]** for Default

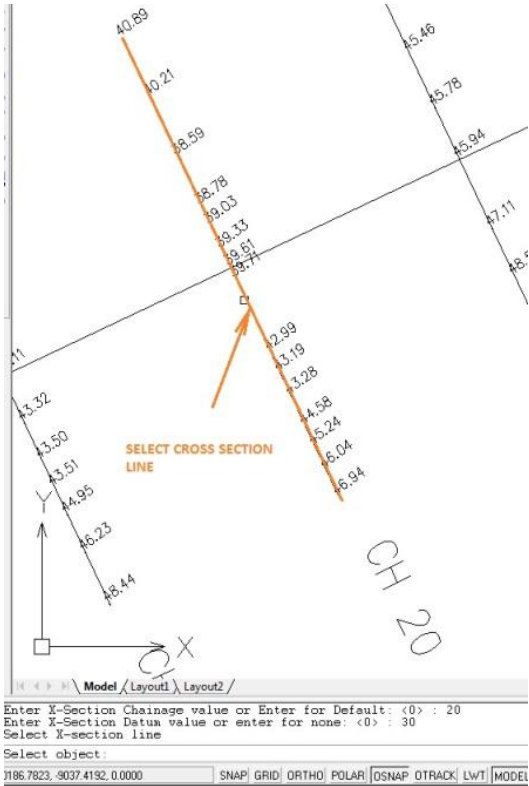


6. Type in the Chainage [20]

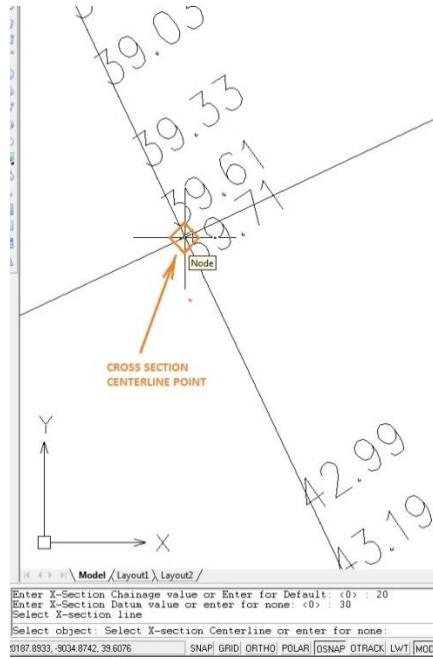


7. Next prompt user to input [DATUM] or [ENTER] for Default  
 Note: DEFAULT DATUM is set to [0] Zero

8. Next prompt user to Select Cross Section Line

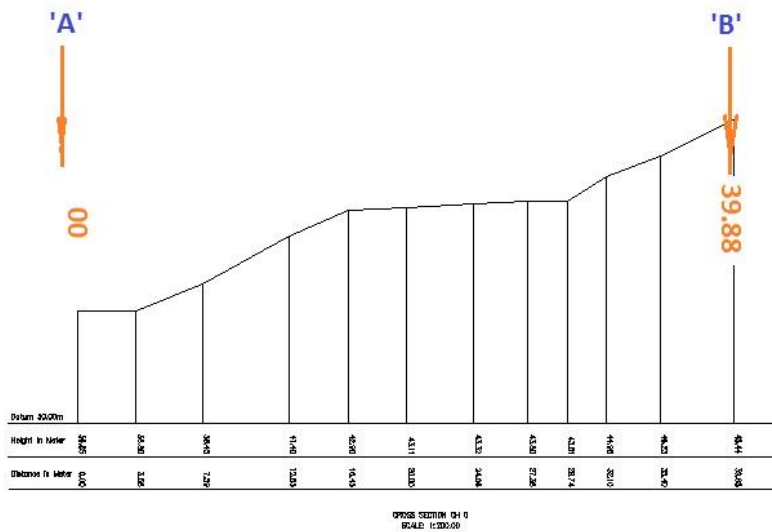


9. Next prompt user to select **[CENTER LINE POINT]** or ENTER for **[NONE]**

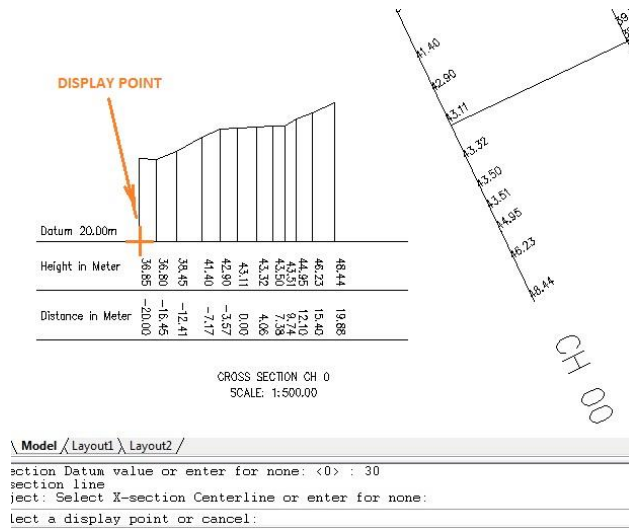


Note: If User **ENTER for NONE**, the program use the BEGINNING of LINE at 'A' as the **CENTER LINE POINT = "00"** and **ENDS at 'B'**

See Diagram Below



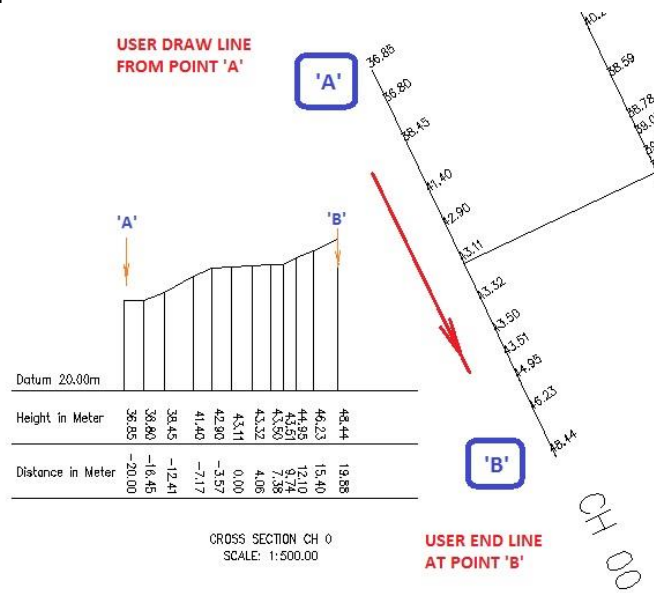
10. Next prompt user to select **[Display Point]** on the Screen.



11. Next prompt user to select the next CROSS SECTION CHAINAGE.  
Go back to Step No.5 and repeat the same sequence.

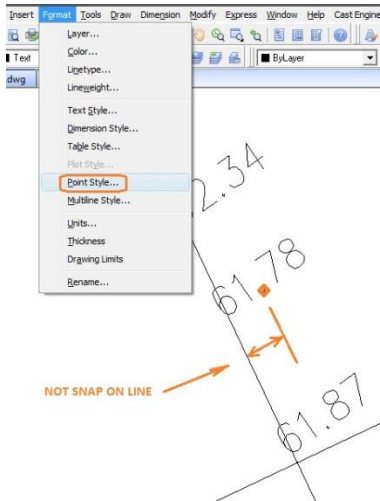
**AutoCad system takes the plotting of Line as [BEGINNING of LINE and [END of LINE]**

1. Plotting of CROSS SECTION LINE Users must always take care about the direction the Line was drawn.
2. See example below.

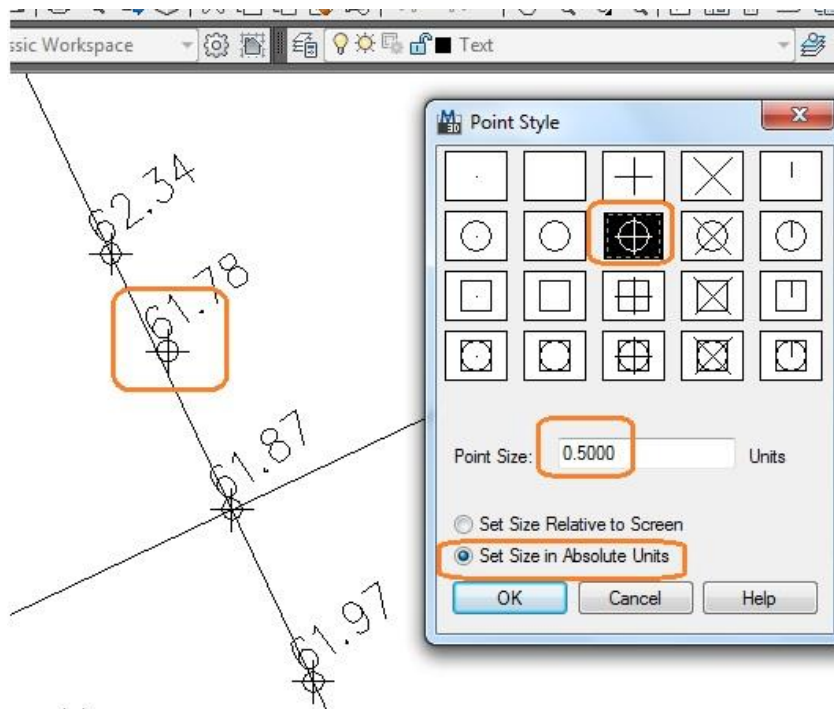


## Setup for Level Points did not Snap on top of Cross Section Line

1. Level Point not snap on the line, we can temporary change the **[POINT STYLE]**



2. Choose **[FORMAT]** at top MENU Choose **[POINT STYLE]**  
Select any POINT STYLE and Type in [POINT SIZE] to the size that the point touch the line



## 1.24. Change Datum for Spot Level

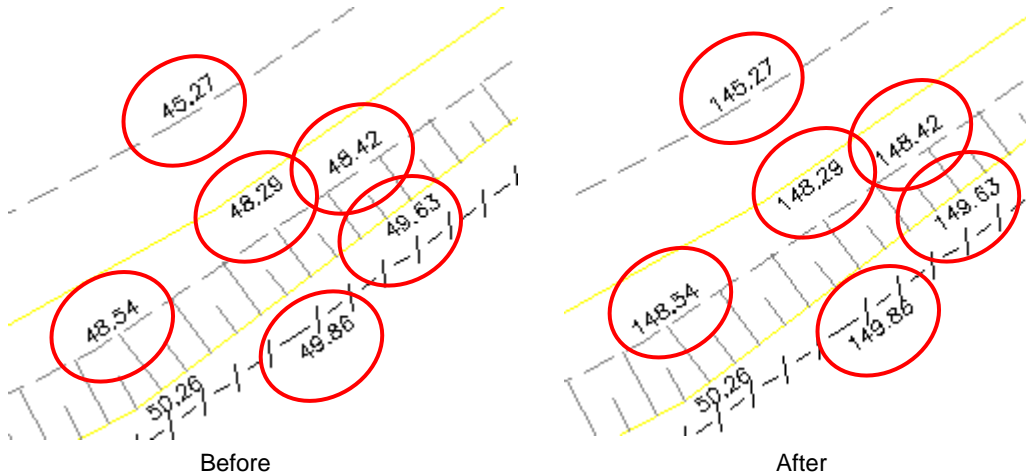
### Change Datum For Text Level

Function Description: to change the text value of spot level

1. Choose Change Datum for Sport Level > Change Datum For Text Level
2. Enter a new datum to add to text (as shown in illustration below)

```
*Cancel*  
Add new datum to Text or Point [ Text | Point ]: Text  
Enter new datum to add to Text RL: 100
```

3. Select objects (you can use any selection method) and then right click mouse button to complete the command. (See illustrations below)



4. Repeat step 2 to 3 to continue.

### Change Datum For Point Level

Function Description: to change the point value of spot level

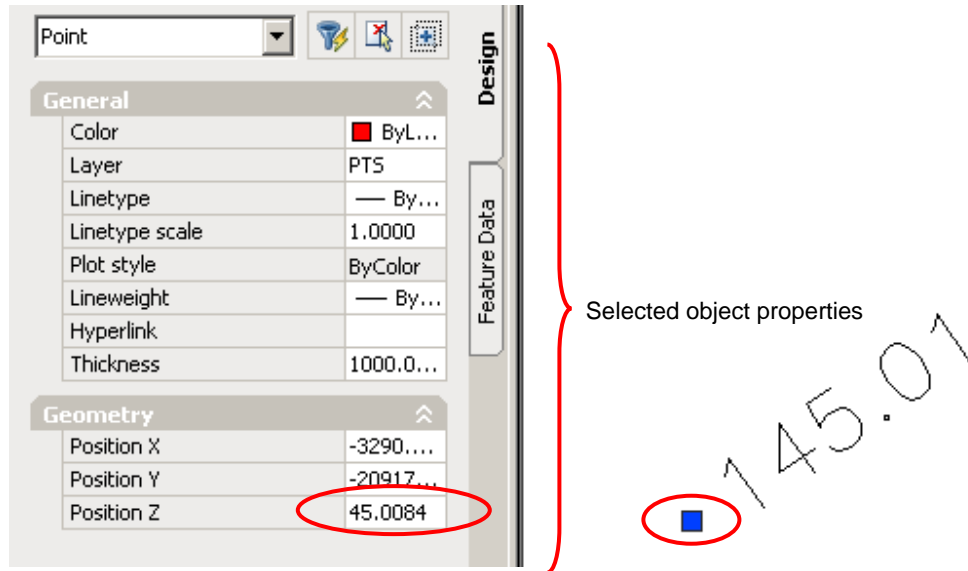
1. From Cast3 menu, choose Change Datum for Sport Level > Change Datum For Point Level.
2. Enter a new datum to add to point (as shown in illustration below)

```
*Cancel*  
Add new datum to Text or Point [ Text | Point ]: Point  
Enter new datum to add to Point RL:
```

Example: you enter 100



3. **Select objects** (you can use any selection method) and then right click mouse button to complete the command. (See illustrations below)



The properties for position **z** was 45.01 (the value before make any

## 1.25. Traverse Line

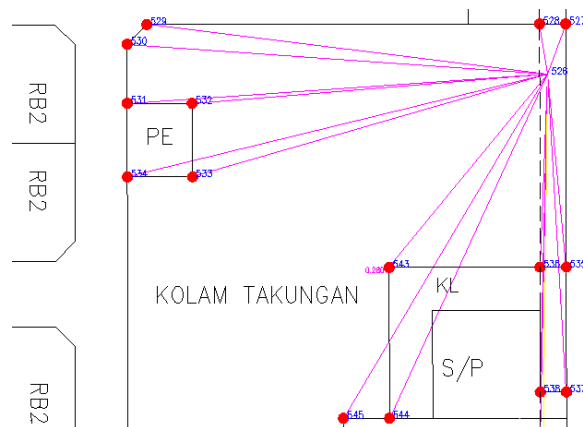
Function description: to create an object, such as a line or an arc using bearing and distance entry

1. From the Cast3 menu, choose Traverse Line.
2. Specify the starting point by use pointing device or enter the x, y coordinate.
3. Enter the integer label (optional) "STN" number
4. Enter the angle 125deg 30' 30"
5. Enter the angle using the current angular units setting – 125.3030
6. Enter the distance
7. Repeat step to continue.
  - If you set none for step 3, repeat step 4 – 5
  - If you set integer STN label, repeat step 3 – 5
8. Press Esc to cancel

## 1.26. Radiate Line from Station

Function description: to plot the radiate line from station

1. From Cast3 menu, choose Radiate Line from Stn.
2. The command window will prompt you to start point.  
You can start point by picking any point or specify the coordinate
3. On command line, enter new integer label or press enter for none
4. Enter the bearing >Enter the distance.
5. On command line, enter the next integer label or presses enter to accept the current value.
6. Repeat Steps 4 to 5 to continue
7. Press Esc to cancel.
8. Example:

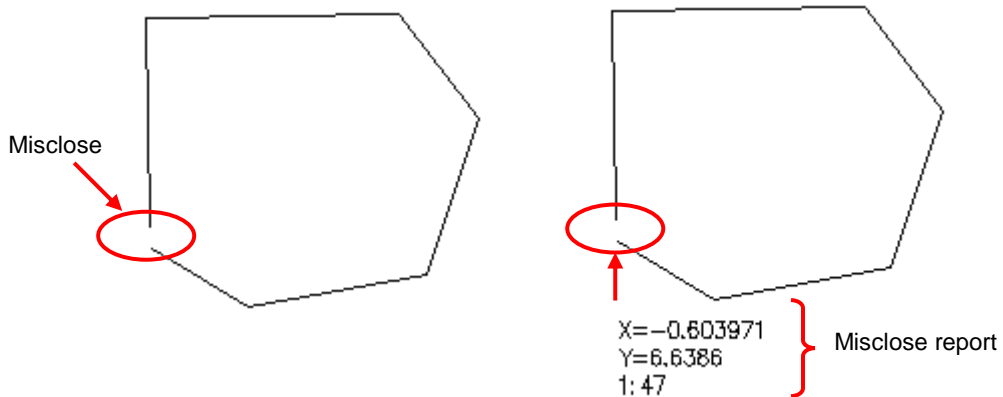


## 1.27. Traverse Line Function

### Traverse Misclose Report

Function description: to display the traverse misclose ratio

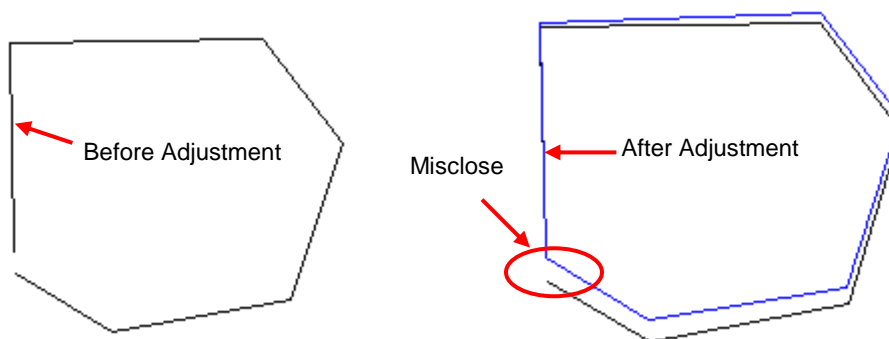
1. From the Cast3 menu, choose **Traverse Line Function** > Traverse Misclose Report
2. Specify the starting and end point
3. Select object and then right click mouse button to see a result of traverse misclose ratio.
4. Example:



### Bowditch Adjust Misclose

Function description: To make adjustment of the traverse Misclose

1. From the Cast3 menu, choose **Traverse Line Function** > Bowditch Adjust Misclose
2. Specify the last and first point
3. Select object and then right click mouse button to see the adjustment of traverse misclose.
4. Example:



Note: the best way to see a difference by setting a new layer for the adjustment of traverse Misclose.