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Subject : CT-123 (surveying-1)

Instructer : Engr. Humaira Arshad

Assigment : Quiz

Samister : B-Tech 8th samester

Q1:- The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line 2.82, 3.37, 5.82, 4.28, 6.59, 7.90, 8.52, 7.42, 5.43m. calculate the area enclosed b/w the survey line irregular boundry line and first & last offset by:

A) simpsons rule B) Trapezoidal Rule
C) Average ordinate Rule.

Ans: Give data:-

Required calculate Area by
1-> Averaged ordinate rule.
2-> Trapezoidal rule
3-> simpsons rule.

Solution:-

By Average ordinate method

Here $d = 10m$ and $n = 9$

Base length $= 10 \times 9 = 90m$

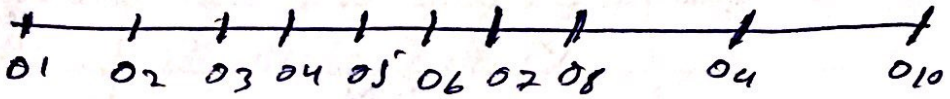
No of oodinate $= n+1 = 9+1 = 10$

Required Area =

$$\frac{90 \times (2.82 + 3.37 + 5.82 + 4.28 + 6.59 + 7.90 + 8.52 + 7.42 + 5.43}{10}$$

Required Area = $\frac{90 \times 52.13}{10}$ 469.17

$$\text{R Area} = 469.17 m^2$$



Base Length = 90m

By Trapezoidal Method

$$d = 10m$$

$$RA = 10/2 \left(\begin{matrix} 2.82 + 5.43 + 2 (3.37 + 5.82 + 4.26 \\ + 6.59 + 7.9 + 8.52 + 7.42) \end{matrix} \right)$$

$$RA = 10/2 \ (96.01) = 480.05 m^2$$

★ By simpsa Rule

$d = 10$

$$R \cdot A = \frac{10}{3}\left(2.82 + 5.43 + 4(3.37 + 4.26 + 7.9 + 7.42) + 2(5.82 + 6.59 + 8.5^2)\right)$$

$$RA = \frac{10}{3}\left(2.82 + 5.43 + 4(22.95) + 2(2.93)\right)$$

$$RA = \frac{10}{3}\left(2.82 + 5.43 + 45.9 + 41.86\right)$$

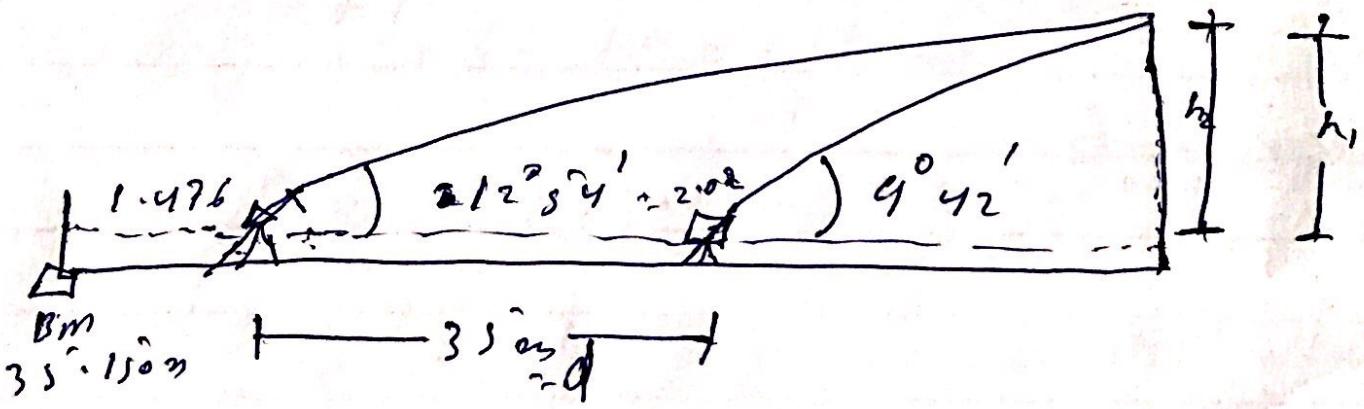
$$RA = \frac{10}{3}(96.01) = \frac{960.1}{3} = 320.0$$

$$RA = 320.03\ m^2$$

Q2:- To determine the elevation of top of church tower, The following observation were made station A & B and top of church tower are in the same vertical plane. Distance b/w A and B = 35m.

Instrument station	Reading on BM	angle of Elevation	Remarks
Station A	1.476	12° 5' 4"	
Station B	1.362	9° 42'	

Solution



$S_1 = 1.362$

$S_2 = 1.476$

$\delta = S_2 - S_1 = 1.476 - 1.362 = 0.114$

* $D = \dfrac{\delta + d \tan\alpha_2}{\tan\theta_1 - \tan\alpha_2}$

Here $\alpha_1 = 9°42'$, $\alpha_2 = 12°5'4'' \cdot 8d = 35m$

$$\Rightarrow D = \frac{0.114 + 35 \tan(12°5'4'')}{\tan(9°4'2 \tan(12°5'4'')}$$

$$= 190.73m$$

$l_{21} = D \tan\alpha_1 = 180.73 \tan(9°42') = 53.86m$

R.L of top Ch. mark = R.L of B.M + S_1 + h_1

$= 35.50 + 1.362 m + 53.86$

$\Rightarrow 90.372m$

Q3: Two straights AB & BL intersect at a chainage of 4242 m. The angle of intersection is 140° it is required to set out 5° curve to connect the straights. Calculate all the data necessary to set out the curve by method of offsets from the chord produced. Peg interval is 30m.

Ans 3:

- The chain used is of 30m
- Radius of curve, $R = 1720/D = 344m$
- Deflection Angle $\Delta = 180° - 140° = 40°$
- Tangent length $= R = \tan(\Delta/2) = 344 \tan 20°$

$= 125.2 m$

- Chainge of intersection point

$B = 4242 m$

- ~~Chainge of T_2 = Chainge of T_1~~
- Chainge of $T_1 = (4242 - 125.2) = 4116.9m$

Length of curve $= R\Delta \pi/180 = 240.16m$

Chainge of T_2 = Chainge of T_1 + Length of curve

$= 4116.8 + 240.16 = 4356.96m$

- Length of chords
- First sub-chord C_1 4140 − 4116.8 = 23.2m
- Last sub-chord C_9 = 4356.9 − 4350 = 6.96m
- There are seven unit chords of 3m length
- Hence, they will be nine chords altogether

The offsets are

$O_1 = C_1^2/2R = 23.3/2 \times 344$

~~$O_n = 30(23.2 + 30/$~~

$O_n = C_n (C_{n-1} + C_n) 2R$

$O_2 = 30(23.2 + 30/2 \times 344 = 2.32m$

$O_3 = O_4 + O_8 = 302/344 = 2.62m$

$O_9 = 0.37m$

Q4s: Explain the following:

i> Objective of Hydrographic surveying.

ii> Equipment of making soundings.

iii> Classification of Leveling.

Ans: i> Objective of Hydrographic surveying.

Hydro-graphic surveying are carried out fo one or more of the following activities.

1> Measuremet of tides fo sea coast work e.g. construction of sea defense works harbors etc. for the establishment of leveling datam and for reduing sounding.

2> Determination of bed depth, by soundings.

* For navigation
* location of rocks sand bars, navigation light.
* Fro location of under water works volumes of under water excavation etc.
* In connection with irrigation and land drainage schemes.

3> Determination of direction of current in connection with,

* The location of sewer any pipe or channel that carry waste water out falls.
* Determination of area subject to silt and scour the eating of the place.
* Farnication purposes.
* Measurement of quantity of water and flow of water in connection of water schemes, Power scheme & flood controls.

ii> Equipment for making Soundings:

* Sounding Boat: It should be sufficiently roomy & stable. Flat bottomed boat is suitable in quite water is round bottomed boat is convenient is rough water. A power boat (steam or motor launch) is most suitable when wind is ~~Blow~~ blowing and the water currents are strong.

* Sounding Rods or Poles: It should be sufficiently roomy and stable. Flat bottomed boat is suitable in quite water is round bottomed boat is convenient in rough water. A power boat (steam or motor ünch) is most suitable when wind is blowing and the water currents are strong.

* Sounding Rods or poles :- Sounding Rods or Poles are convient in shallow and smoth water up to depths of about 4 to 6m (15-20ft). They are made of well-seasoned timber and are auvicilar in section of abut 5cm diameter and 3 to 7.5m long graduated in meter or centimeter (ft or inches) with a metal shoe at the bottom.

* Sounding chain: For regular sounding a brass such-chain is most satisfatory since its length is practically const i.e. The links are welded. The brass tags are attached at 0.2m (1) interval but leather or cloth tags are preferred as the brass tags can injure the hands of the surveyor the chain should be tested periodically.

* Fathometer:- For ocean sounding or insent known as Fathometer is used it is electric device and measure the time required for the sound (impulses) travel to the bottom of water and back. the travell time is converted into depth displayed in either digital or graphic for fathometer is also called echo sourer.

iii> Classification of Leveling:

- ✱ Simple Leveling.
- ✱ Differential Leveling.
- ✱ Fly Leveling.
- ✱ check Leveling.
- ✱ Profile Leveling or L-section
- ✱ cross-sectioning
- ✱ Precise Levelling.
- ✱ Trigonometric Leveling.

✱ Simple Leveling: It is the simplest method used, when It is required to find the difference in elevation between 2 points.

✱ Differential Leveling: This method is used to find the difference in the elevation between points if the are too far apart or the difference in elevation between them is too much.

* Fly Levelling: Fly levelling is just like differential of levelling carried out to check the accuracy of levelling work. In fly levelling only B.S and F.S are taken.

* Check Levelling: This kind of levelling is carried out to check the accuracy of work. It is done at the end of the days work in the form of fly levelling to connect the finishing point and starting point.

* Profile Levelling or L-section: This method is used for taking levels along the centre line of any alignment like road, railway canal etc. The object is to determine the undulation of the ground surface alongo the alignment.

★ Cross-sectioning: The operation is carried out perpendicular to alignment at an interval of 10, 20, 30, 40m. The idea is to make an estimate of earthwork.

★ Precise Levelling: It is used for establishing bench marks for future public use. It is carried out with high degree of accuracy using advanced instrument.

★ Trigonometric Levelling: In this method vertical distance between points are computed by observing horizontal distance and vertical angle between points.