



AVIT
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

SURVEY CAMP 2021-22

Name of the student : _____

Register number : _____

Year/Semester : _____

P. Kalyan
HoD/Civil Engg.

List of Experiments

1. Measurement of area of given land surface by the method of triangulation and trilateration
2. Profile levelling of a road surface
3. Topographic mapping by the method of contouring

Experiment No-1

Measurement of area of given land surface by the method of triangulation and trilateration

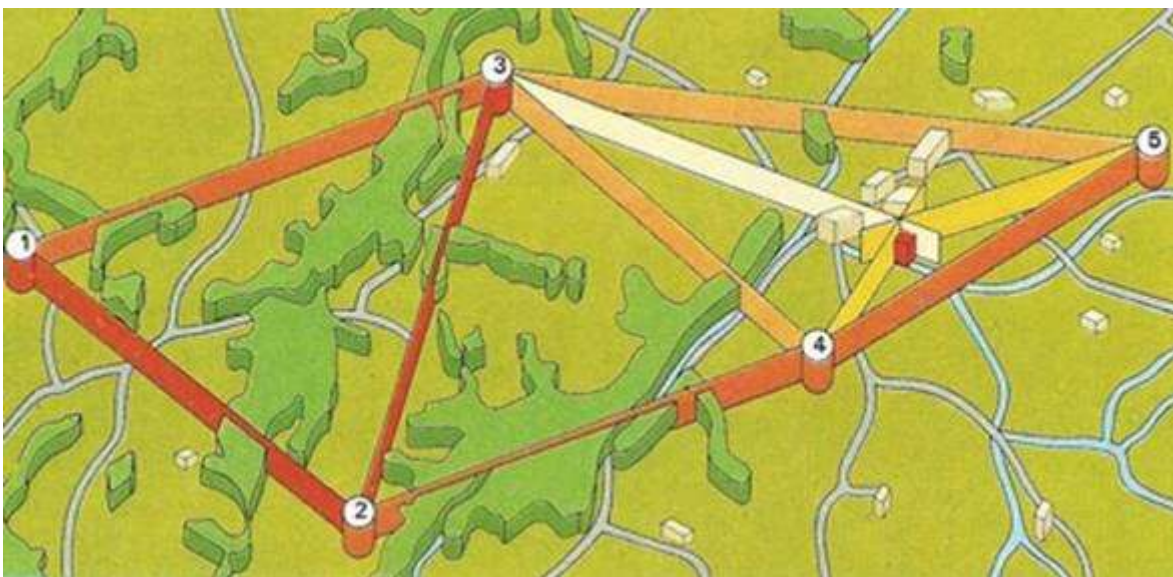
Introduction

Triangulation :

Triangulation surveying is the tracing and measurement of a series or network of triangles to determine distances and relative positions of points spread over an area, by measuring the length of one side of each triangle and deducing its angles and length of other two sides by observation from this baseline.

Triangulation is preferred for hills and undulating areas, since it is easy to establish stations at reasonable distances apart, with intervisibility. In plane and crowded areas it is not suitable as the intervisibility of stations is affected. The difficulty is overcome by building towers which is quite expensive.

The main disadvantage of triangulation is the accumulation of error in the lengths and direction of lines, since both of them, for successive lines, depend upon the computations for those of the preceding line, which necessitates the check bases. In triangulation, entire area to be surveyed is covered with a framework of triangles.



Plan as per your measurement

Area for calculation

Result

Area of total land measured _____ m²

Area of total land measured _____ Feet²

Included angle of points measured:

(i) Angle A-

(ii) Angle B-

Experiment No-2

Profile levelling of a road surface

Definition:

Profile levelling is the process of levelling along a fixed line to determine the elevations of the ground surface along the line

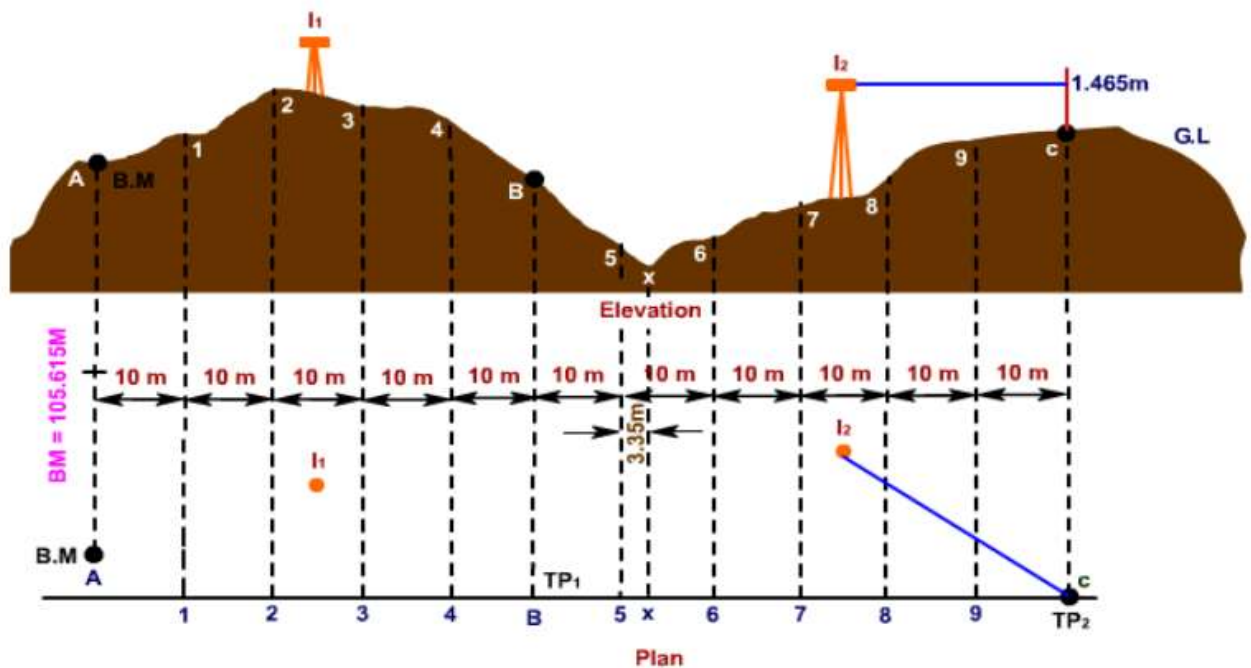
Use of profile levelling:

1. Profile leveling is a method of surveying that has been carried out along the central line of a track of land on which a linear engineering work is to be constructed
2. The fixed line is generally the centre line of a highway, railway, canal, sewer or any other such utility.
3. The fixed line need not be a single straight line; it may consist of different straight reaches connected by curves.
4. The ground profile is the section of the ground obtained when a vertical plane cuts the ground surface. The ground profile shows the elevations of the ground along the section.
5. The profile levelling is done to determine the undulations of the ground surface.
6. The ground profiles are used for the study of the relationship between the existing ground levels and the levels of the proposed route.
7. The gradient line is drawn and the formation levels at various points are determined and the amount of cutting and filling can be computed.

PROCEDURE:

1. In carrying out profile leveling, a level is placed at a convenient location (say I1) not necessarily along the line of observation.
2. The instrument is to be positioned in such a way that first backsight can be taken clearly on a B.M.
3. Then, observations are taken at regular intervals (say at 1, 2, 3, 4) along the central line and foresight to a properly selected turning point (say TP1).
4. The instrument is then re-positioned to some other convenient location (say I2).

5. After proper adjustment of the instrument, observations are started from TP1 and then at regular intervals (say at 5, 6 etc) terminating at another turning point, say TP2 .
6. Staff readings are also taken at salient points where marked changes in slope occur, such as that at X.
7. The distances as well as direction of lines are also measured.



CALCULATION OF REDUCED LEVEL

Reduction of levels can be done either by height of instrument method or by rise and fall method, computations have been carried out by both the methods and subsequently their checks are done.

| Pegs | Distance(m) | Direction | Staff Reading (m) | | | Difference in Elevation (m) | | H.I (m) | R.L(m) | Remarks |
|------|-------------|-----------|-------------------|-----|-----|-----------------------------|------|---------|--------|---------|
| | | | B.S | I.S | F.S | Rise | Fall | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | Σ | | | | | | | | |

Result
 Σ B.S. - Σ F.S. =
 Σ Rise- Σ Fall =
Last R.L. - First R.L.=

Experiment No-3

Topographic mapping by the method of contouring

- ✓ A contour line is a line that connects points of equal elevation.
- ✓ Grid survey is usually carried out in order to have an accurate record of the existing conditions of a portion of land that is about to undergo some type of construction activity.
- ✓ Then the all the students were divided into two groups at different stations. Students who had a good observing theodolite skill took reading at both stations.
- ✓ The indirect method of grid contour survey was adopted. In this method, some guide points were selected along a system of straight lines and their elevations were found.
- ✓ The points were then plotted and contours were then drawn by interpolation. While interpolating, it was assumed that slope between any two adjacent guide points to be uniform
- ✓ The contour lines was drawn by interpolation.
- ✓ The method issued when the area to be surveyed is small and the ground is not much undulating.
- ✓ The area to be surveyed was divided into number of squares. The size of each grid was 2m x 2 m.
- ✓ The elevation at the corner of the square was then determined by means of a level and a staff.
- ✓ Then, students took reading by the theodolite for Computing distances and elevations of earthwork of their station.

CONCLUSION

By going the grid contour survey map can be drawn, so that one can select most economical or suitable site for construction