

## **COMPASS SURVEY**

### **RADIATION AND INTERSECTION METHOD**

**Aim:**

To determine the area of the given field by radiation and intersection method using a prismatic compass.

**Instruments required:**

Prismatic Compass, Chain, Arrows, and Ranging rods

**Procedure:**

After conducting the reconnaissance survey, the surveyor should fix up the positions of all the station, around the given field as usual. The survey may be conducted under the following methods.

- (1) Radiation method
- (2) Intersection method

### **RADIATION METHOD**

**(a) Field work**

In this method, the approximate centre of the field is located and the compass is exactly centered over that stations, say 'O' by dropping a small pebble to fall from the centre of the compass and hit the peg. Then make the compass needle horizontal by adjusting the ball and socket joint.

After centering and leveling of the compass, raise the sighting vane and prism of compass. The compass box is rotated until the ranging rod at first station 'A' hairline of object vane and slit of the sighting vane are in the same line. Then take the reading accurately and note down the bearing of line OA.

In the similar way take bearing of lines OB, OC, OD and OE by rotating the compass box in the respective directions. The readings will indicate the angles with which the line, OA, OB, OC, OD and OE makes with the north line. Then with the help of chain, measure the distances OA, OB, OC, OD and OE on ground, after proper ranging.

**(b) Plotting**

By knowing the observed bearings and distances to all the stations from the centre 'O' the plan of the plot can be easily drawn by adopting a suitable scale. Join the station points A, B, C, D, E which will indicate the plan of the plot. The area enclosed by the plot may be calculated by splitting the plan into number of triangles.

**Result**

Area of given field by Radiation method =

## INTERSECTION METHOD

### **(a) Field Work**

This method poses a simple change from the previous method. In this method mark two points (P & Q) at a distance of 10 to 15 m in such a way that all the station points around the boundary of the plot can be seen clearly (either inside the area or outside).

Set the compass over the station point 'P' and complete the temporary adjustments. Observe bearings to all the station points, (A, B, C, D & E) in clockwise direction. Take also the fore bearing of the line 'PQ'. Shift the compass to the other station 'Q' and complete the temporary adjustments and observed the back bearing of the line 'QP'. Rotate the compass box to all other station points, (A, B, C, D & E) and note down all the bearings clearly. Also measure the base line distance (PQ). In this method there is no necessity of measuring the internal distances.

### **(b) Plotting**

With observed data, plot the observed bearings taken at P and project the corresponding rays. Set the distance PQ and get point 'Q' by taking a suitable scale. Then draw rays from station 'Q' to all the station points. The intersection of ray pa and qa will give the location of station 'A'. Similarly locate other stations B, C, D & E. For a check, measure the distance AB, of one side, and compare them with the plotted lengths. Then field can be divided into number of triangles and the area can be calculated, summering up all the areas we will get the total area of the field.

### **Result:**

Area of the given field by intersection method =