

CHAIN AND CROSS STAFF SURVEY

Aim:

To locate the boundaries of a given field and also to determine the area.

Instruments required:

Chain, Cross staff, Arrows, Ranging rods and Offset rods

Procedure:

In order to calculate the area of any irregular shaped field, it is necessary to divide that area into number of right angled triangles and trapezoids.

Corners along the boundary of the field should be first identified and named as A, B, C, D, E, F, G *etc.* in clockwise direction. Any two stations located in opposite sides should be selected in such a way that distance between them is the longest of other stations and almost equal numbers of corners/ stations are located on both sides. Chaining should be started along the base line and offset distance to the corners on both sides to be measured simultaneously after ranging, as already explained. All the details should be entered in the field book.

Care should be taken that no offset is overlooked before the chain is moved forward. To check the accuracy of the field work boundary line between any two corners should be measured directly and compared. After the field work is over the survey data may be plotted to a suitable scale on a drawing paper.

The area enclosed by the boundary lines is divided into a number of triangles and trapezoids as shown in figure. The area of each segment is computed and written in tabular form as given below.

DETAILS OF MEASUREMENTS AND AREA COMPUTATION

S. No.	Figure	Chain distance (m)	Base length (m)	Offset (m)	Mean offset (m)	Area (m ²)
(1)	(2)	(3)	(4)	(5)	(6)	(4) x (6) (7)
1.	ΔDHC	0 – 18	18	2, 26	13	234
2.	ΔHCJB	18 – 52	34	26, 28	27	918
3.	ΔJBAL	52 – 77	35	28, 22	25	875
4.	ΔLAG	77 – 90	13	22, 0	11	143
5.	ΔFKG	90 – 61	29	0, 22	11	319
6.	ΔFKIE	61 – 35	26	22, 16	19	494
7.	ΔEID	35 – 0	35	16, 0	8	280
Total area						3263

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(1)	(2)	(3)	(4)	(5)	(6)	(4) x (6) (7)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
Total area						