LAB REPORT
ON
ENGINEERING GEOLOGY
II

The true dip of the inclined bed is 1:5 due east. Find the apparent dip along
(a) N40°E (b) S70°E (c) S30°E

(a) N40°E

Procedure

A straight line was drawn at 40° from North towards east. Inclination of bed is 1:5, it means 1 unit in vertical and 5 units in horizontal. At 5 units from origin along east, a line was drawn parallel to NS, perpendicular to EW. This line intersected the line at N40°E (i.e. AB). The number of units was counted on line AB. Let, n units was obtained then apparent dip is 1:n.

Apparent dip obtained = 1:7.9

(b) S70°E

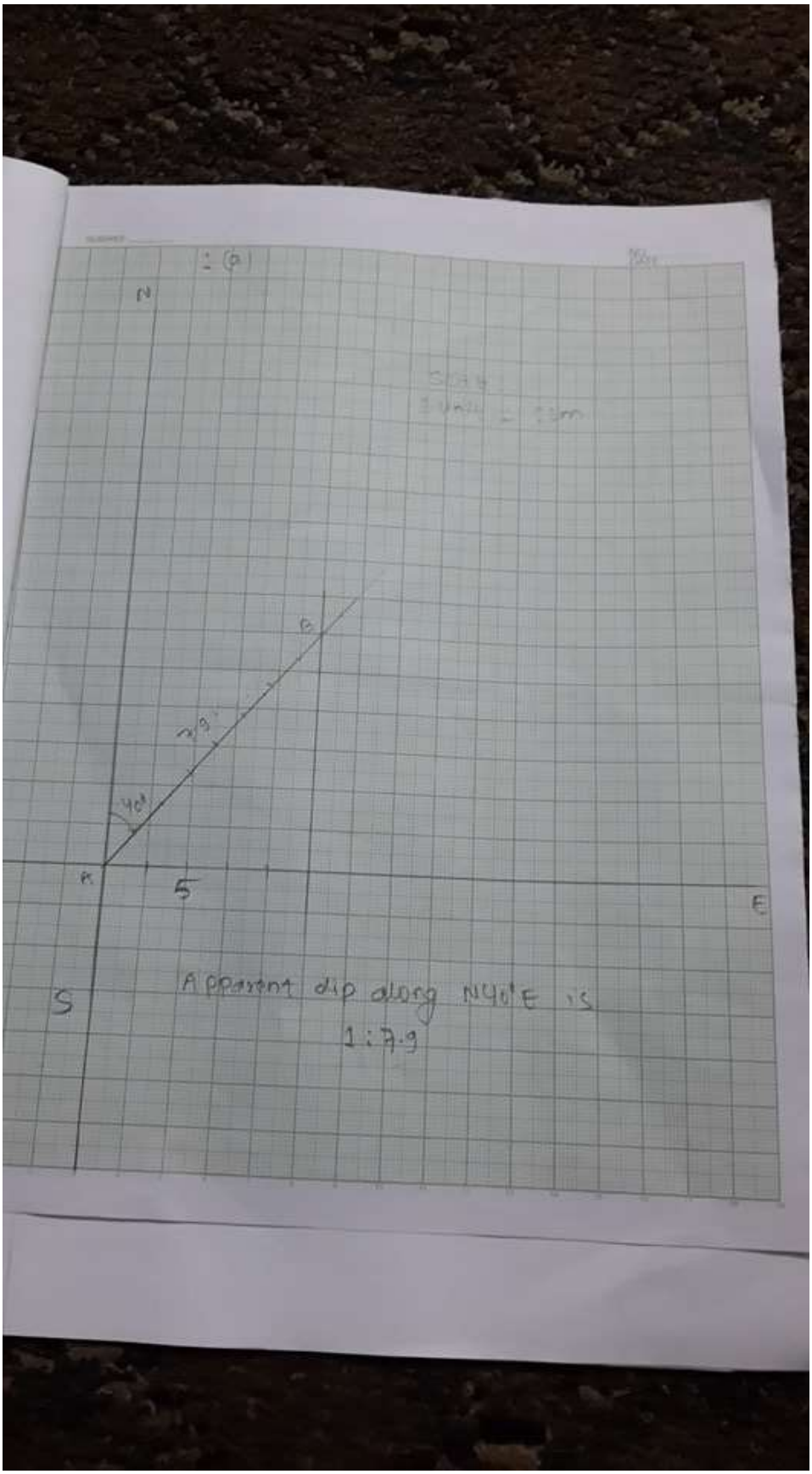
A straight line was drawn at 70° from South towards east as in fig. 1(b), line is CD. At 5 units from C along east, line was drawn perpendicular to EW which intersected CD at D. Number of units was counted from C to D which gave apparent dip.

Apparent dip obtained = 1:5.4

(c) S30°E

A straight line FG was drawn at 30° from South towards East and at 5 units from F along WE, towards East, a line perpendicular to EW as drawn which intersected at G of line FG. Number of units was counted from F to G which gave apparent dip in form 1:n where n is no. of units obtained.

Apparent dip obtained = 1:10

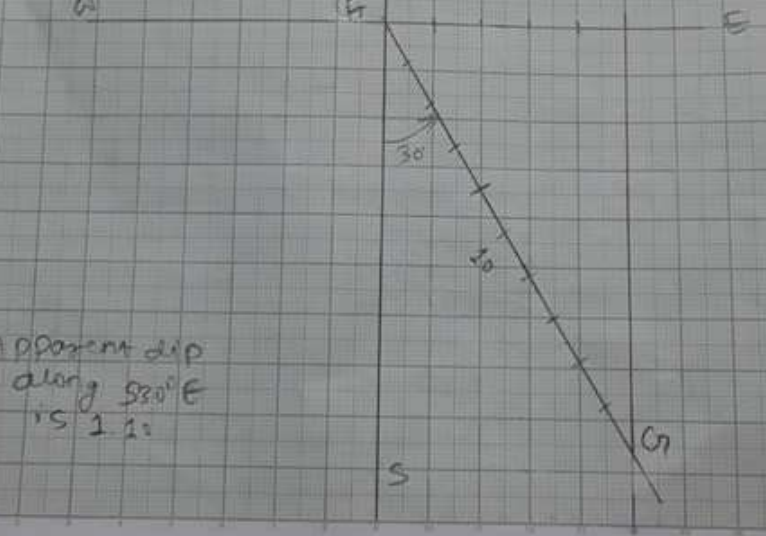

: (a)
N
B
7.9
40°
A
5
E
S
Apparent dip along N40°E is
1 : 7.9

(2) (b)

Apparent dip along S30°E = 1:5.9

(2) (c)

Scale:
1 unit = 1 cm



Apparent dip along S30°E is 1 in

Dip direction = N60°W

(2) The apparent dip amount of an inclined bed is 1:14 and 1:20 along N40°W and N20°W respectively. Calculate the true dip amount and direction.

Procedure

A line AB of 1:20 at N20°W was drawn and another line AC at N40°W of apparent dip 1:14 was drawn. A line passing through B and C was drawn then a line perpendicular to BC line was drawn from A to meet at D (a point on line BC when extended). Then number of units in AD was counted from which tone dip was obtained.

True dip obtained = 11.4

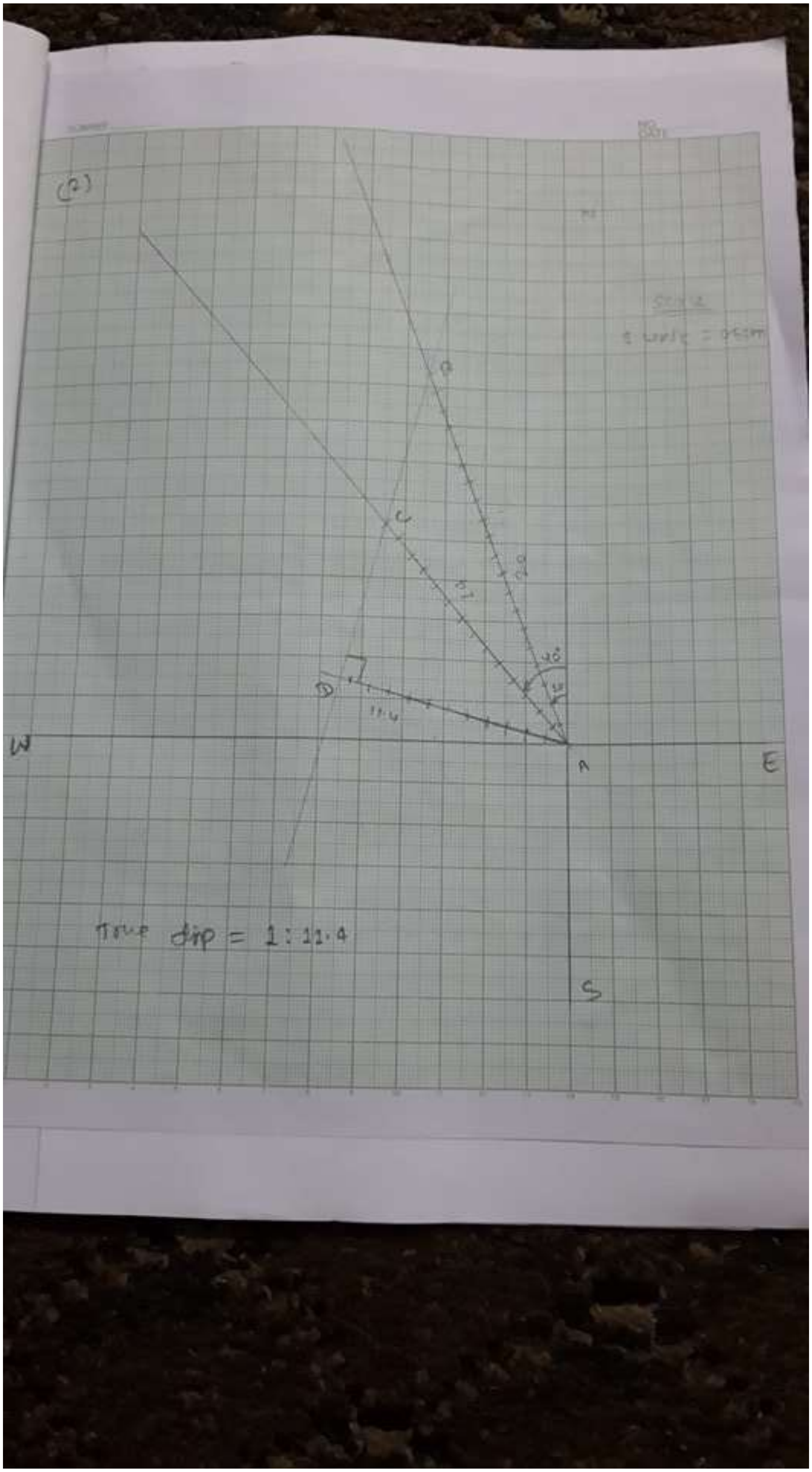
3) In a featureless (flat), ground, three bore holes A, B & C were sunk to ascertain the attitude of old bed. At point A, the old bed was reached at the depth of 600m. At B and C, the bed was encountered at a depth of 900m & 400m respectively. The bore hole B is located 1500m away due S45°W of A. similarly, the bore hole C is S10°E of A and is fixed at 800m. Determine the attitude of old bed.

Attitude of old bed is

Strike = N24°E

Dip amount = $\tan^{-1}\left(\frac{700-600}{220}\right) = 24.44°$

Dip direction = N66°W



(2)
C
D
W
A
E
S
True dip = 1: 11.4

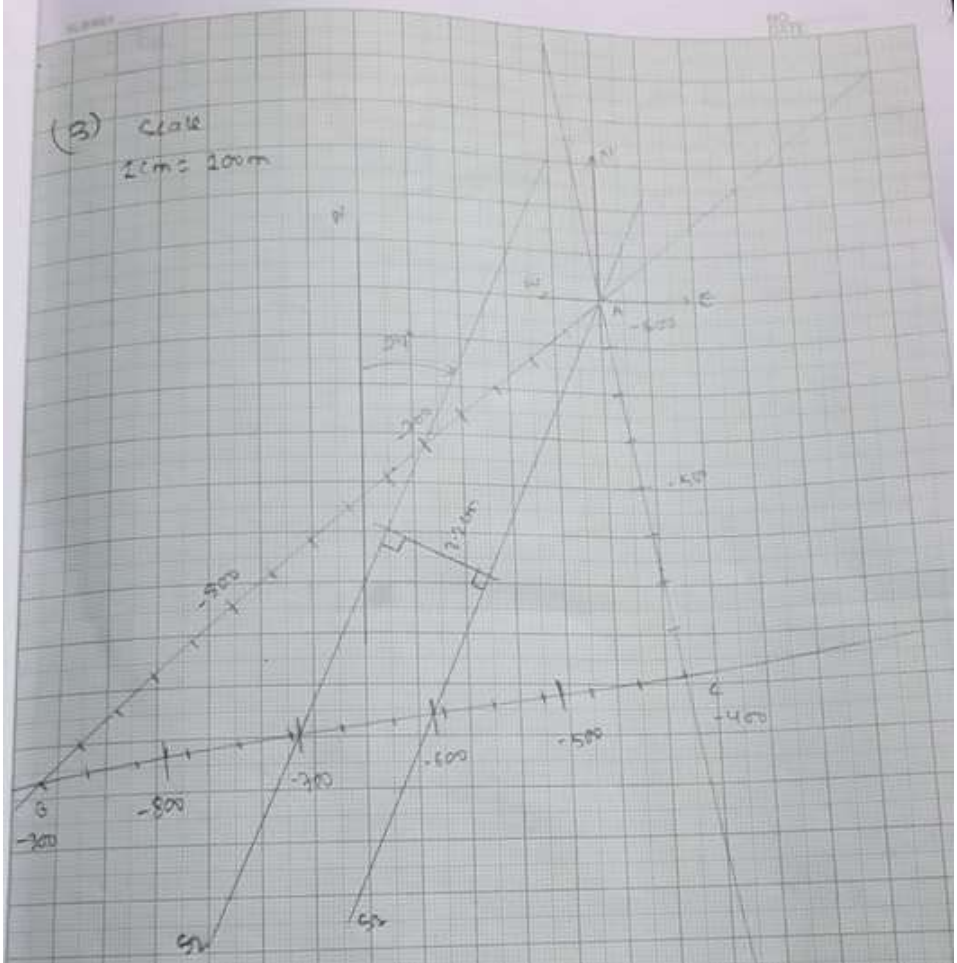
Procedure

Firstly, point A was fixed then with respect to it, B was plotted at 150m from A along S45°W of A and C was plotted at 800m away from A along S10°E of A. B was joined to C. At A, depth is -600m, at B -900m and at C -400m. AB was divided into three equal parts each of 50m (total 150m) so as to plot -800m and -700m at equal distances. AC was divided into two equal parts each of 400m so as to plot one depth i.e. -500m. BC was divided into 5 equal parts so as to plot four depth i.e. -800m, -700m, -600m and -500m. The line joining two equal depths give strike direction. Two strike lines were obtained parallel to each other namely S_1 and S_2 at -600m and -700m respectively. The perpendicular distance between both lines were measured and Dip amount was determined by, Dip amount = $\tan^{-1}\left(\frac{\text{Difference in vertical distance of two strike lines}}{\text{measured perpendicular distance between them}}\right)$

Strike direction was found by measuring the angle made by strike line with North.

Dip direction is perpendicular to strike which was calculated by adding 90° to strike line's direction.

(3) Scale
1cm = 100m



Strike = N24° E

Dip amount = $\tan^{-1}\left(\frac{70-60}{220}\right)$ = 24.44°

Dip direction = N66° W

a) In a coal field, a number of drill holes were driven to ascertain the structure of coal sink. Datas are as follow-

Drill No.	depth of coal sink below ground level	horizontal distance from drill hole A
A	370	—
B	970	3000m due S 10°W of A
C	670	2400m due S75°E of A
D	470	1100m due S40°W of A

For plane ABC

Strike = N70°E

Dip amount = $\theta = \tan^{-1}\left(\frac{570-470}{4200}\right) = 13.4°$

Dip direction : S20°E

For ADC

Strike = N67°E

Dip amount = $\theta = \tan^{-1}\left(\frac{570-470}{2.4\times2000}\right) = 11.76°$

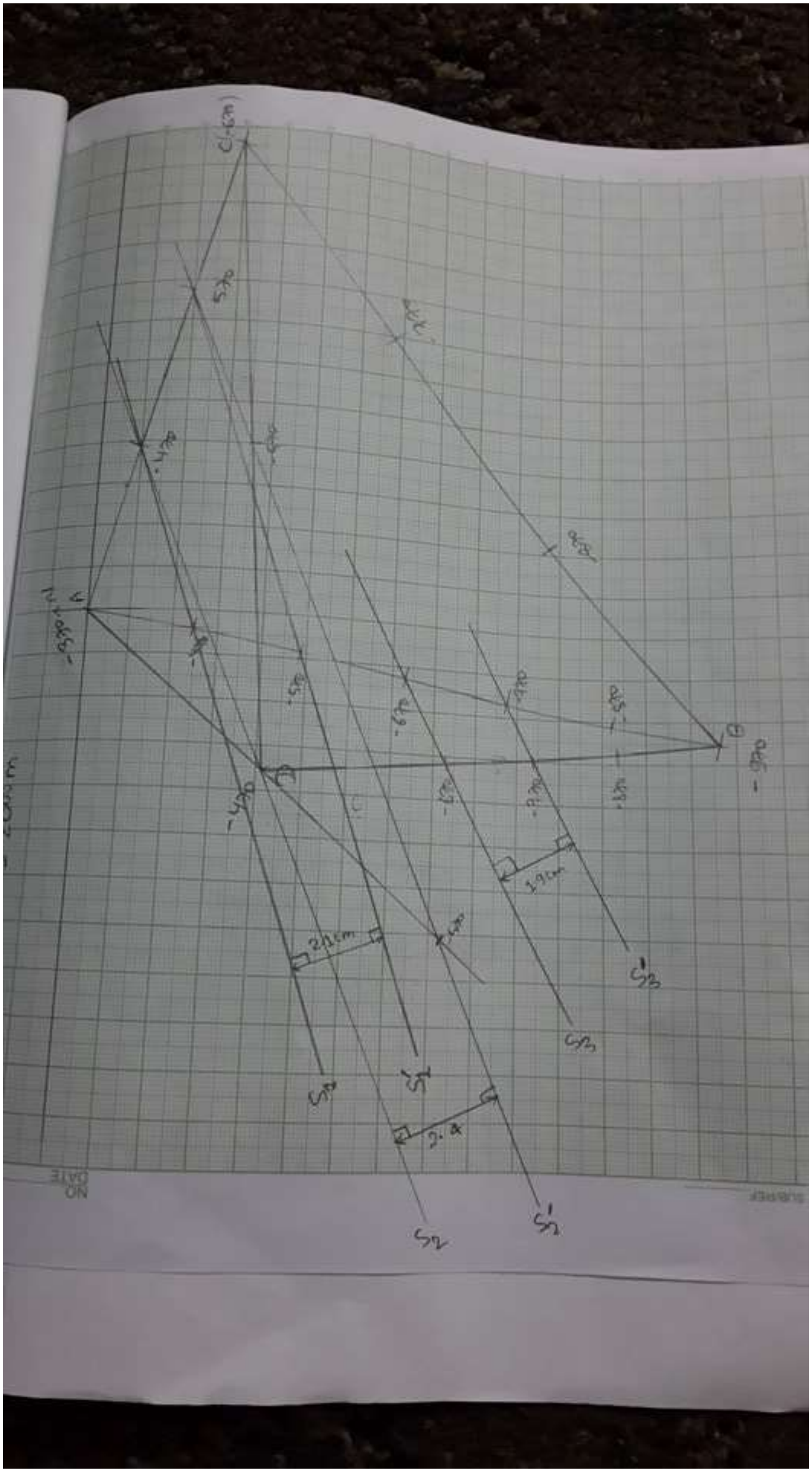
Dip direction = S23°E

For ABD

Strike : N61°E

Dip amount = $\theta = \tan^{-1}\left(\frac{770-670}{1.9\times2000}\right) = 14.74°$

Dip direction : S29°E



S2
S'2
S3
S'3
2.4

Procedure

Point A was fixed. B was located along S20°W of A at 3000m (15cm in scale 1cm = 200m), C was located 2400m (12cm in scale 1cm = 200m), and D along S75°E of A and D was located along S40°W, 1100m (55cm in scale 1cm = 200m). DC, DB and BC were joined. For ABC, two strike lines were drawn at depth 470m and 570m, S_1 and S_1' respectively. Perpendicular distance was measured between S_1 and S_1'. Then dip amount was calculated using $\theta = \tan^{-1}\left(\frac{\text{difference in strike altitude}}{\text{Distance between them}}\right)$.

By using protractor, direction of strike was measured and then dip direction was found.

similarly, for ADC, two strike S_2 and S_2' at 470m and 570m was drawn and their strike direction, dip amount, dip direction was found in the similar way.

For ABD also, two strike lines, S_3 and S_3' at 670m and 770m was drawn, perpendicular distance was measured between them and using protractor strike direction was measured, dip amount was calculated and then dip direction was found.