



SURVEYING-I UNIT -I

FUNDAMENTAL PRINCIPALS FOR SURVEYING

DEFINITION

- SURVEYING IS THE TECHNIQUE OF MAKING SUCH MEASUREMENTS AS WILL DETERMINE THE RELATIVE POSITIONS OF POINTS ON THE SURFACE OF THE EARTH IN ORDER THAT THE SHAPE AND EXTENT OF ANY PORTION OF EARTH'S SURFACE MAY BE ASCERTAINED AND DILINEATED ON A MAP OR PLAN.

OBJECTIVE OF SURVEY

- PRIMARY OBJECTIVE IS TO PREPARE A MAP OR PLAN.
- RESULTS OF SURVEYS WHEN PLOTTED AND DRAWN ON PAPER TO SOME SCALE CONSTITUTE A PLAN.
- IF THE SCALE IS SMALL, REPRESENTATION ON PAPER IS CALLED A MAP e.g. MAP OF INDIA, PLAN OF A BUILDING.

CLASSIFICATIONS OF SURVEY

- BASED UPON THE NATURE OF THE FIELD OF SURVEY – LAND, MARINE, ASTRONOMICAL
- BASED UPON THE OBJECTIVE OF SURVEY – ARCHEOLOGICAL, GEOLOGICAL, MINING, MILITARY
- BASED UPON THE METHODS EMPLOYED IN SURVEY – TRANGULATION, TRAVERSE
- BASED UPON THE INSTRUMENTS EMPLOYED – CHAIN, THEODOLITE, TACHEOMETRIC, COMPASS, PLANE TABLE, PHOTOGRAPHIC AND AFRIAI

LAND SURVEY

- TOPOGRAPHICAL SURVEYS – TO DETERMINE THE NATURAL FEATURES AS WELL AS ARTIFICIAL FEATURES OF A COUNTRY e.g. HILLS, VALLEYS, RIVERS, LAKES, ROADS, BUILDINGS etc.
- CADASTRAL SURVEYS – TO DETERMINE ADDITIONAL DETAILS LIKE BOUNDARIES OF HOUSES etc.
- CITY SURVEYS – FOR LAYING OUT PLOTS AND CONSTRUCTING STREETS, WATER SUPPLY SYSTEMS etc.
- ENGINEERING SURVEYS – TO DETERMINE QUANTITIES AND TO COLLECT DATA FOR DESIGN OF ROADS, SEWERAGE SYSTEM etc.

ENGINEERING SURVEYS

- RECONNAISSANCE SURVEYS – TO DETERMINE THE FEASIBILITY AND ROUGH COST OF THE SCHEME.
- PRELIMINARY SURVEYS – TO CHOOSE THE BEST LOCATION, TO ESTIMATE THE EXACT QUANTITY AND COSTS.
- LOCATION SURVEYS – FOR SETTING OUT THE WORK ON THE GROUND.

FUNDAMENTAL PRINCIPLES OF SURVEYING

- TO WORK FROM THE WHOLE TO THE PART
- TO FIX THE POSITION OF NEW STATIONS BY ATLEAST TWO INDEPENDENT PROCESSES

TO WORK FROM THE WHOLE TO THE PART

- TO ESTABLISH A SYSTEM OF CONTROL POINTS WITH HIGH PRECISION.
- THE POINTS ARE ESTABLISHED BY TRIANGULATION OR PRECISE TRAVERSING.
- IN TRIANGULATION, THE AREA TO BE SURVEYED IS DIVIDED INTO LARGE TRIANGLES WHICH ARE SURVEYED WITH THE GREATEST ACCURACY.
- THESE LARGE TRIANGLES ARE FURTHER SUB-DIVIDED INTO SMALL TRIANGLES WHICH ARE SURVEYED WITH LESS ACCURACY.
- THIS SYSTEM CONTROLS AND PREVENTS THE ACCUMULATION OF ERRORS.
- IN WORKING FROM PART TO THE WHOLE, SMALL ERRORS BECOME VERY BIG IN THE PROCESS OF EXPANSION OF SURVEY.

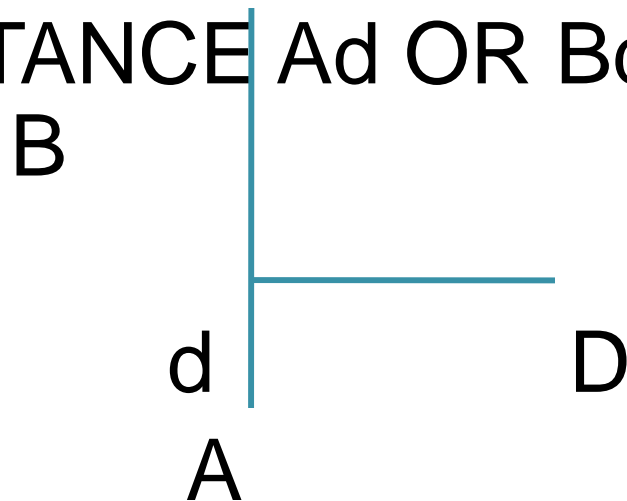
TO FIX THE POSITIONS OF NEW STATIONS

- THE NEW STATIONS ARE FIXED FROM POINTS ALREADY FIXED FROM –
 - (a) LINEAR MEASUREMENTS
 - (b) ANGULAR MEASUREMENTS
 - (c) BOTH LINEAR AND ANGULAR MEASUREMENTS

METHODS OF FIXING POINTS

TO LOCATE A POINT D WITH RESPECT TO TWO OR MORE GIVEN POINTS OF REFERENCE:

1. RECTANGULAR COORDINATES METHOD- BY THE PERPENDICULAR Dd AND THE DISTANCE Ad OR Bd.

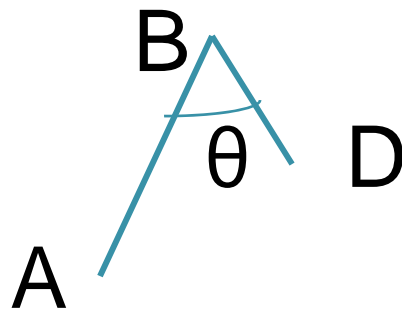


METHODS OF FIXING POINTS CONTD...

2. TRILATERATION – BY TWO
DISTANCES AD AND BD . A

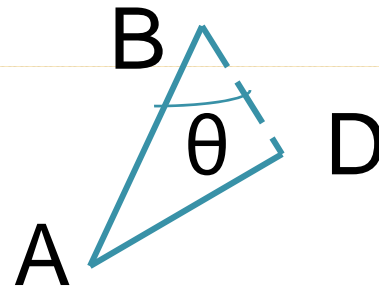


3. POLAR COORDINATES METHOD- BY
ANGLE DBA AND DISTANCE BD.

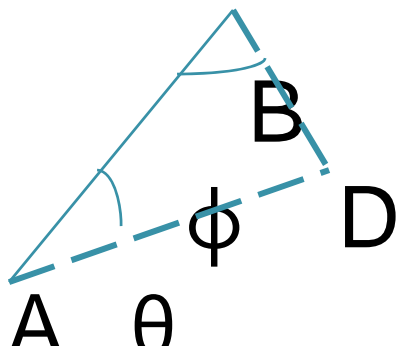


METHODS OF FIXING POINTS CONTD...

4. BY THE ANGLE DBA AND THE DISTANCE AD .



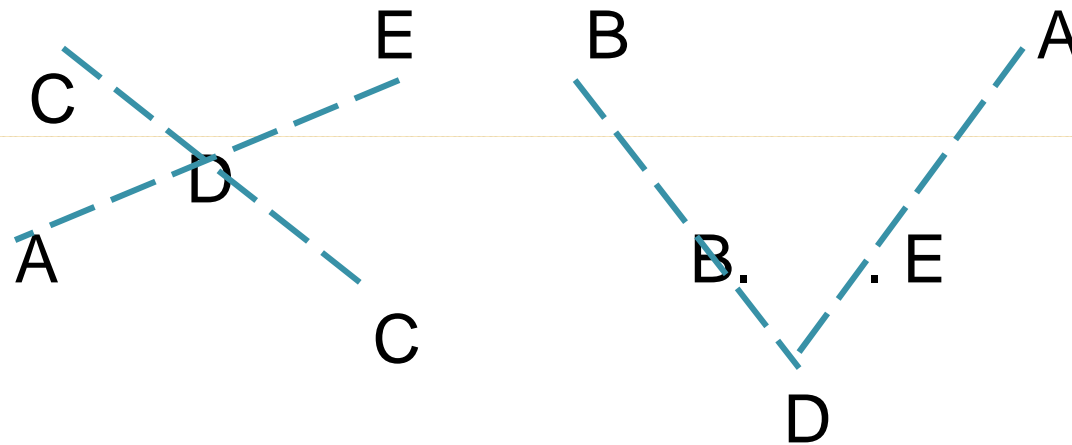
5. TRAIINGULATION – BY THE TWO ANGLES BAD AND ABD MEASURED AT A AND B.



METHODS OF FIXING POINTS CONTD...

6.

BY INTERSECTION OF TWO STRAIGHT LINES AB AND CE WITH D AS INTERSECTION POINT.



7.

BY THE TWO ANGLES ADB AND BDC WITH RESPECT TO THREE KNOWN POINTS A, B AND C

