What is Surveying?

Surveying is the art of determining the relative positions of points on, above or beneath the surface of the earth by means of direct or indirect measurements of distance, direction and elevation. It also includes the art of establishing points by predetermined angular and linear measurements.

Practically, every engineering project such as water supply and irrigation Schemes, Rail roads and transmission lines, mines, bridges and buildings etc. require surveys. Before plans and estimates are prepared, boundaries should be determined and topography of the site should be ascertained.

Scale

The area that is surveyed is vast and, therefore, plans are made to some scale. "Scale is the fixed ratio that every distance on the map/plan bears with corresponding distance on the ground".

Scale can be represented as follows :-

1 : 1000 or 1/1000

1 : 500 or 1/500 etc.

The ratio of map distance to the corresponding ground distance is independent of units of measurement.

How to calculate the distance and area from the Map

- For Map scale 1:1000

1 metre on the map = 1000 metres on the ground

100 Cm on the map = 1000 metres on the ground

1 cm on the map = 1000/100 metres on the ground

That is 1 cm = 10 metre on the map

For 2.5 cm = 10x2.5 m

= 25 metre

For a square having 2.5 cm side means each side is 25 m

Therefore the area = 25x25 m= 625 sq. metres

Choice of Scale of a map

The preliminary consideration in choosing the scale are :-

- the use to which the map will be put, and
- the extent of territory to be represented.

Plain Scale

A plain scale is one, on which it is possible to measure two dimensions only, such as metres and decimetres

Diagonal Scale

On a diagonal scale, it is possible to measure three dimensions such as metres, decimetres and centimetres. By principles of similar triangles a short length is divided into number of parts in which the sides are proportional.

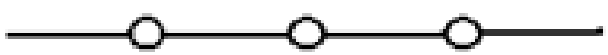
Map/Plan

The representation is called a MAP if the scale is small while is called a PLAN if the scale is large.

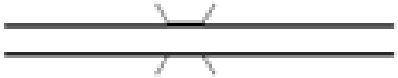
Conventional Symbols:-

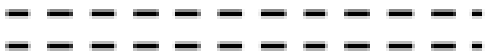
Different features on the ground are represented by different symbols. Some conventional symbols commonly used are:-

i) Fencing (barbed wire) ..... 

ii) Railing ..... 

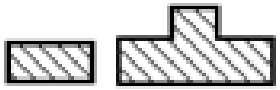
iii) Stone fence ..... 

iv) Road with bridge (Metalled) .. 

v) Un Metalled road ..... 

vi) Evergreen trees ..... 

vii) Tree ..... 

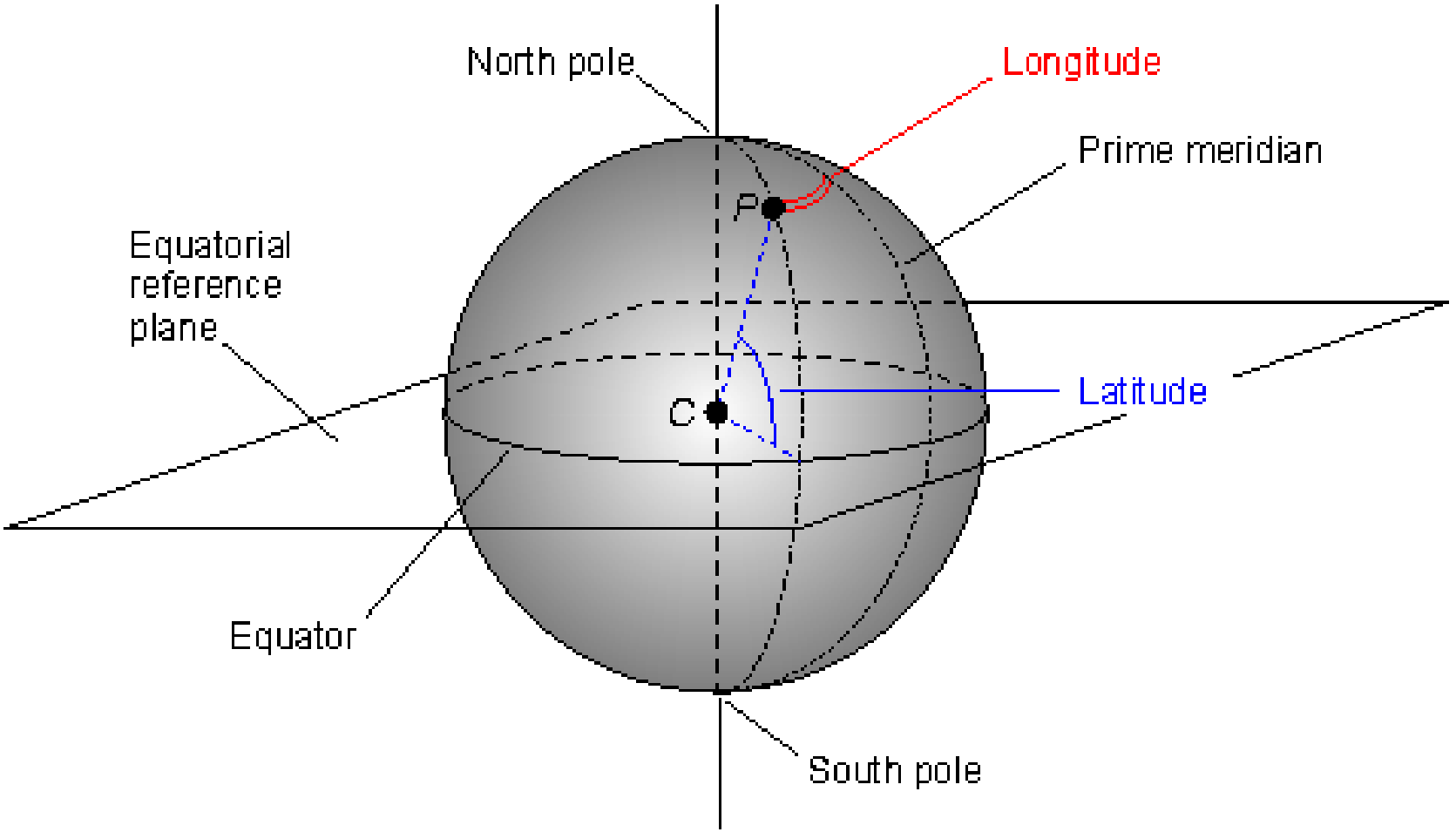
viii) Building ..... 

ix) Telephone post .....

x) Electric post ..... 

The "**latitude**" (abbreviation: Lat., φ, or phi) of a point on the Earth's surface is the angle between the equatorial plane and the straight line that passes through that point and through (or close to) the center of the Earth.[n 3] Lines joining points of the same latitude trace circles on the surface of the Earth called parallels, as they are parallel to the equator and to each other. The north pole is 90° N; the south pole is 90° S. The 0° parallel of latitude is designated the equator, the fundamental planeof all geographic coordinate systems.

The "**longitude**" (abbreviation: Long., λ, or lambda) of a point on the Earth's surface is the angle east or west from a reference meridian to another meridian that passes through that point. All meridians are halves of great ellipses (often improperly called great circles), which converge at the north and south poles.


North pole
Longitude
Prime meridian
P
Equatorial
reference
plane
C
Latitude
Equator
South pole