SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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DEPARTMENT OF AGRICULTURAL ENGINEERING

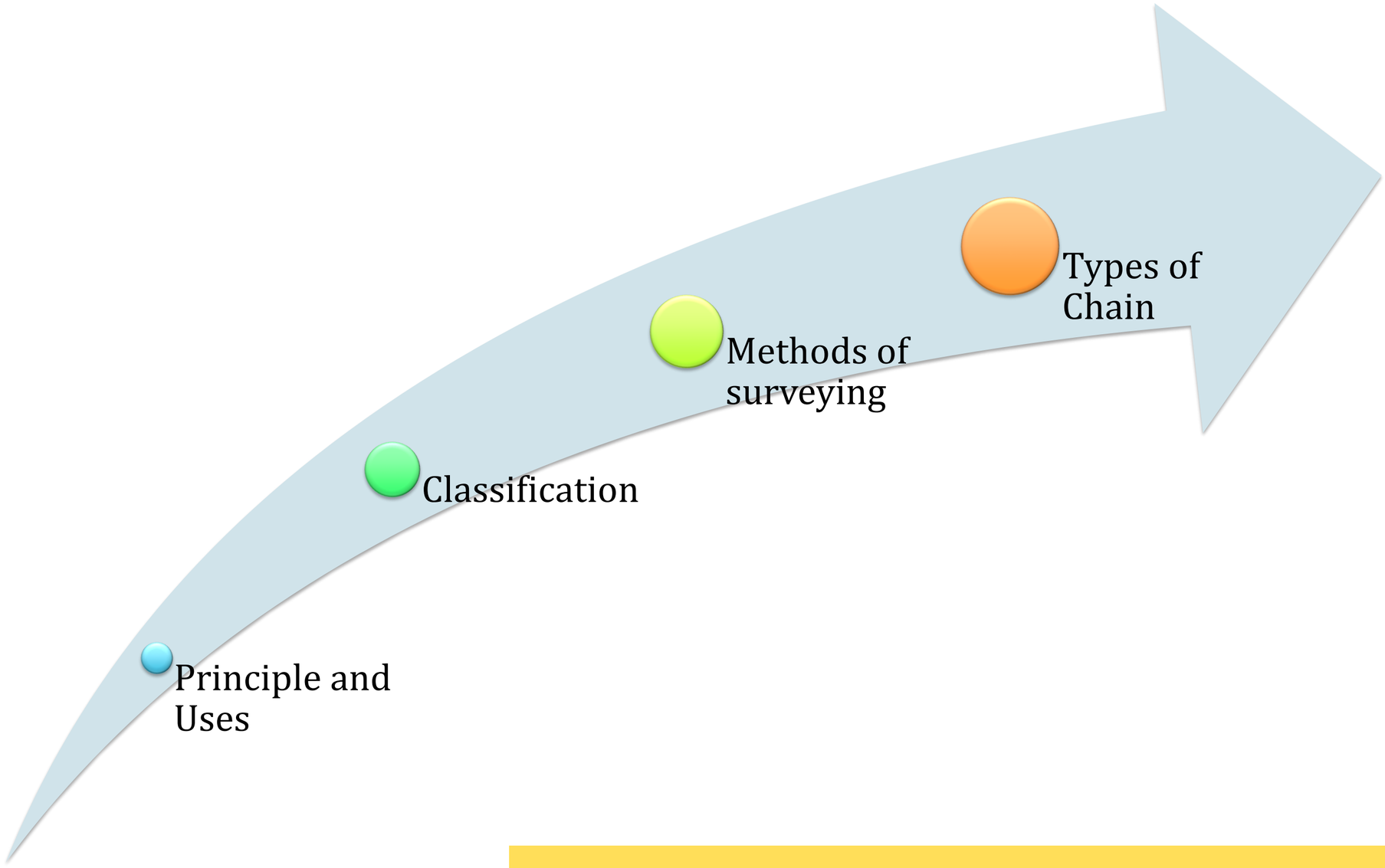
23AGT204 – SURVEYING AND LEVELLING

II – YEAR III SEMESTER

UNIT 1 – OVERVIEW AND CLASSIFICATION OF SURVEYING

TOPIC 5 – RANGING

Last Class Review



Types of Tapes

Cloth Tape or Linen Tape:

•They are woven linen and varnished to resist moisture.

• They are generally 10m, 20m, 30m long and 12 to 15 mm wide.

Fibre tape :

•These tapes are similar to linen and plastic coated tapes but these are made of Glass Fibre.

• These tapes are don’t stretch and shrink due to temperature.

• It is available in 20m, 30m and 50 m length.

Types of Tape

Metallic Tape :

•A linen tape reinforced with brass or copper wires to prevent the stretching or twisting of fibres is called a metallic tape.

• It is commonly used for taking offsets in chain surveying.

Steel tape :

•It is made up with steel material and commonly available in 20 m, 30m or 50m length.

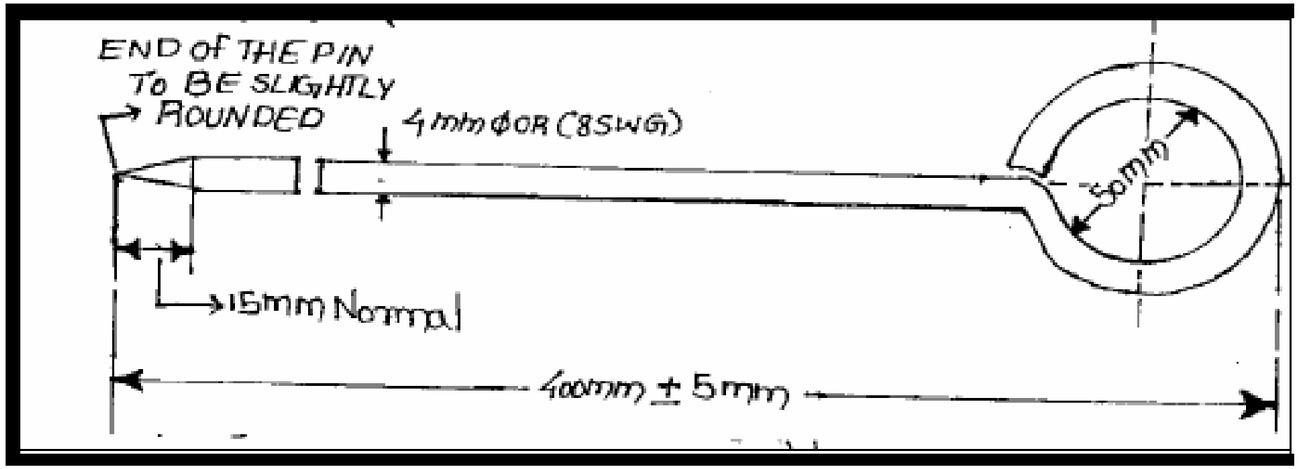
• It is graduated in mt and cm.

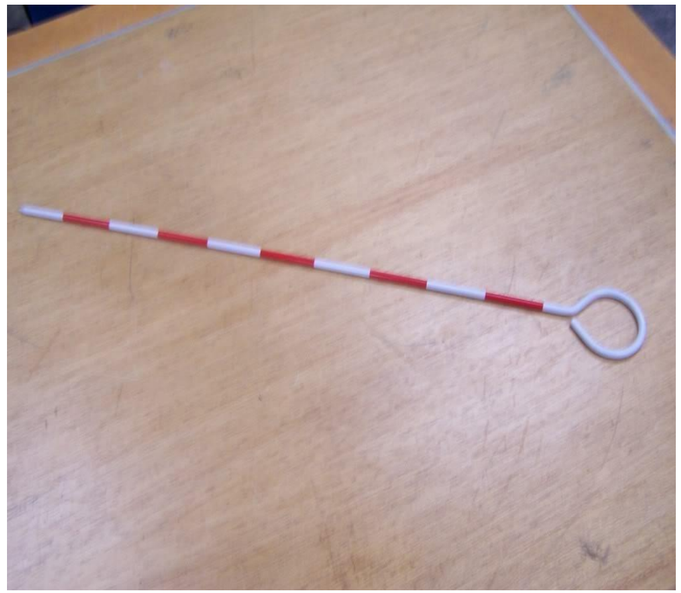
Invar Tape :

- It is made of an alloy of nickel 36 % and steel 64 % having very low thermal expansion.
- These are 6mm wide and generally available in 30m, 50m and 100m.

Arrows

- Arrows are made of tempered steel wire of dia 4mm. One end of the arrow is bent into ring of diameter 50mm and other end is pointed.
- Its overall length is 400mm. Arrows are used for counting the number of chains while measuring chain line. And it is also used to established a intermediate station.





Ranging Rods or Offset rods

- Ranging rods are used for ranging some intermediate points on
  the survey line.
- It is generally 2 to 3 m in length and are painted with alternate bands of black and white or red colors with length of each equalizing 20 cm.
- The offset rod is similar to the ranging rod with the expectation
  that instead of the hook, a flag is provided at the top.

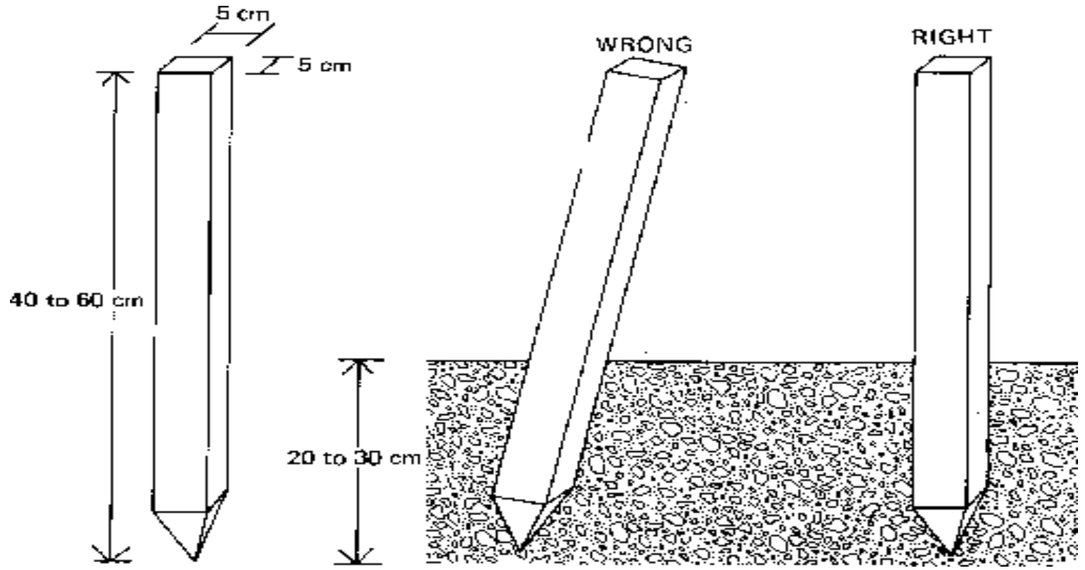
Assessment

- **Whether tape used or chain used for surveying**

Pegs

•Pegs are made of timber or steel and they are used to mark the position of the stations or terminal points of survey line.

•Wooden pegs are 15cm long and driven in to the ground with the help of hammer.

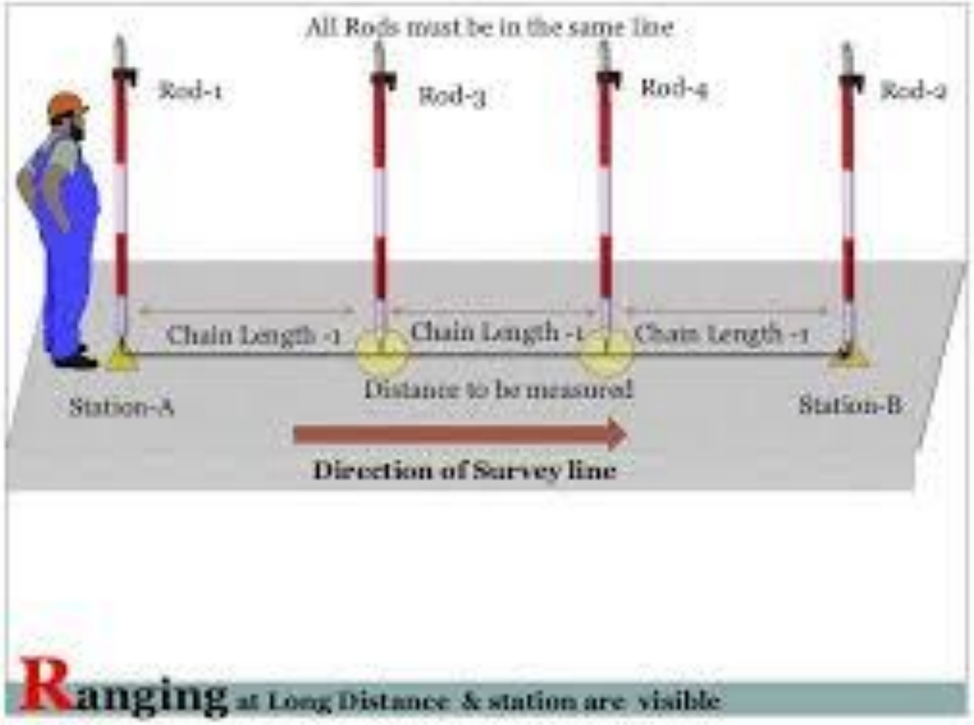


Plumb-Bob

It is used to transfer points on the ground. It is also used for fixing the instruments exactly over the station point marked on the ground by checking the centre of the instrument whether coincides with the centre of the peg.

Ranging

- Ranging-the process of establishing intermediate point on a straight line between two end point



Units of Measurement

- **Measurement**

Magnitudes of measurements are typically given in terms of a specific unit. In surveying, the most commonly used units define quantities of length (or distance), area, volume, and horizontal or vertical angles. The two systems used for specifying units of measure are the English and metric systems. Units in the English system are historical units of measurement used in medieval England which evolved from the Anglo-Saxon and Roman systems. The metric system is a decimalized system of measurement developed in France in late 18th century. Since the metric system is almost universally used, it is often referred to as the International System of Units and abbreviated SI

Units of Measurement

$1\ foot = 12\ inches$

$1\ yard = 3\ feet$

$1\ rod = 5.5\ yards = 16.5\ feet$

$1\ chain = 4\ rods = 66\ feet = 100\ links$

$1\ furlong = 10\ chains = 40\ rods = 660\ feet$

$1\ mile = 8\ furlongs = 80\ chains = 320\ rods = 1{,}760\ yards = 5{,}280\ feet$

$1\ meter = 1{,}000\ millimeters$

$1\ meter = 100\ centimeters$

$1\ meter = 10\ decimeters$

$1\ decameter = 10\ meters$

$1\ hectometer = 100\ meters$

$1\ kilometer = 1{,}000\ meters$

$1\ meter = 39.37\ inches$

$1\ meter * \frac{39.37}{12} \cong 3.2808\ feet$

$1\ foot * \frac{12}{39.37} \cong 0.3048\ meters$

$1\ mile \cong 1609.4\ meters \cong 1.6094\ kilometers$

$1\ square\ foot = 12\ inches * 12\ inches = 144\ square\ inches$

$1\ square\ yard = 3\ feet * 3\ feet = 9\ square\ feet$

$1\ square\ rod = 16.5\ feet * 16.5\ feet = 272.25\ \ square\ feet$

$1\ square\ chain = 66\ feet * 66\ feet = 4{,}356\ square\ feet$

$1\ square\ furlong = 660\ feet * 660\ feet = 435{,}600\ square\ feet$

$1\ acre = 4{,}840\ square\ yards = 43{,}560\ square\ feet$

$1\ acre = 1/10\ square\ furlong = 10\ square\ chains = 160\ square\ rods$

$1\ square\ mile = 1\ section = 640\ acres$

$1\ township = 36\ sections = 36\ square\ miles$

$1\ square\ meter \cong 1.1960\ square\ yards$

$1\ square\ meter \cong 10.7639\ square\ feet$

$1\ hectare \cong 2.4710\ acres$

$1\ square\ kilometer \cong 247.1044\ acres$

$1\ square\ mile \cong 2.5900\ square\ kilometers \cong 258.9998\ hectares$

$1\ square\ meter = 1{,}000\ mm * 1{,}000\ mm = 1{,}000{,}000\ square\ mm$

$1\ square\ meter = 100\ cm * 100\ cm = 10{,}000\ square\ cm$

$1\ hectare = 100\ meters * 100\ meters = 10{,}000\ square\ meters$

$1\ square\ kilometer = 1{,}000\ m * 1{,}000\ m = 1{,}000{,}000\ square\ m$

$1\ square\ kilometer = 100\ hectares$

$1\ cubic\ meter = 1{,}000\ mm * 1{,}000\ mm * 1{,}000\ mm = 1{,}000{,}000{,}000\ cubic\ mm$

$1\ cubic\ meter = 100\ cm * 100\ cm * 100\ cm = 1{,}000{,}000\ cubic\ cm$

Reference Videos

See You at Next Class!!!!