

INTRODUCTION
&
concept of surveying

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FUNDAMENTALS OF SURVEYING



Historical back ground

Humans have been undertaking surveying activities throughout recorded history. The oldest records indicate that the science began in Egypt. In 1400 BCE, Sesostris divided the land into plots so tax could be collected. Origin of Surveying: B.C 3000 (from Egypt) due to the overflowed Nile River. Try to re-established the boundaries.

- around 14C: invent of Compass in medieval Europe

The Romans also made significant developments in the field with surveying a necessary activity in their extensive building works across the empire

Where did the History of Land Surveying Begin?

The first examples in the history of land surveying date back to the ancient Egyptians during the building of the Great Pyramid at Giza in 2700 BC. There is evidence of the Egyptians using basic geometry to redraw boundary lines when the Nile overflowed its banks.

The Romans were the next civilization to advance on the initial land surveying techniques of the Egyptians. Historical evidence shows that the Roman Empire was the first civilization to employ an official land surveyor within their Empire. They used simple tools to create straight lines and angles. The land surveyors had a range of jobs in the Empire and some of their work is still evident today.

Hundreds of years ago land surveyors would use all sorts of means for measuring distances – such as using chains with links that have a certain known length for example. Additionally land surveyors have to measure horizontal angles which in most cases was done using some form of compass. The quality and accuracy of compasses have increased as time has gone by.

In the past land surveying results were a lot less accurate – not due to the inabilities of the land surveyors themselves – but due to the inaccuracy of the tools that they had access to.

Classifications

- Topographic surveys: preliminary surveys used to tie in the natural and constructed surface feature of an area.
- Hydrographic surveys: preliminary surveys used to tie in the underwater features to a surface control line.
- Route surveys: preliminary, layout, and control surveys that range over a narrow but long strip of land.
- Property surveys: preliminary, layout, and control surveys that determines the boundary locations.
- Aerial surveys: preliminary and final surveys using traditional aerial photography and aerial imagery. Digital camera, multispectral scanners, lidar, and radar
- Construction, Cadastral, Mine, Astronomical, Artillery, **Satellite**



PRINCIPLES AND APPLICATIONS

INTRODUCTION :

Surveying is the art of making such measurements of the relative positions of the points on the surface of the earth, that on drawing them to scale, natural and artificial features are shown in their correct horizontal and vertical relationship.

In other words, Surveying may be defined as

The process of accurately determining and recording the relative position of the features of a portion of the earth's surface

Purpose of Surveying

- The Purpose of any survey is to prepare maps. The basic requirements for preparation of these maps are control points.
 - There are several methods like, traverse, triangulation GPS , etc. to provide these control points, for provision of control points, includes the measurements are
Angular, 2. Linear (distance) 3. Heights

- Traditionally mapping is done using, tapes, Stylointape, chains, plum bob, Theodolite, plane tabling, total station.

- **Conventional**
- **Tedious**
- **Time consuming**
- **Expensive**



• CURRENT MAPPING TRENDS

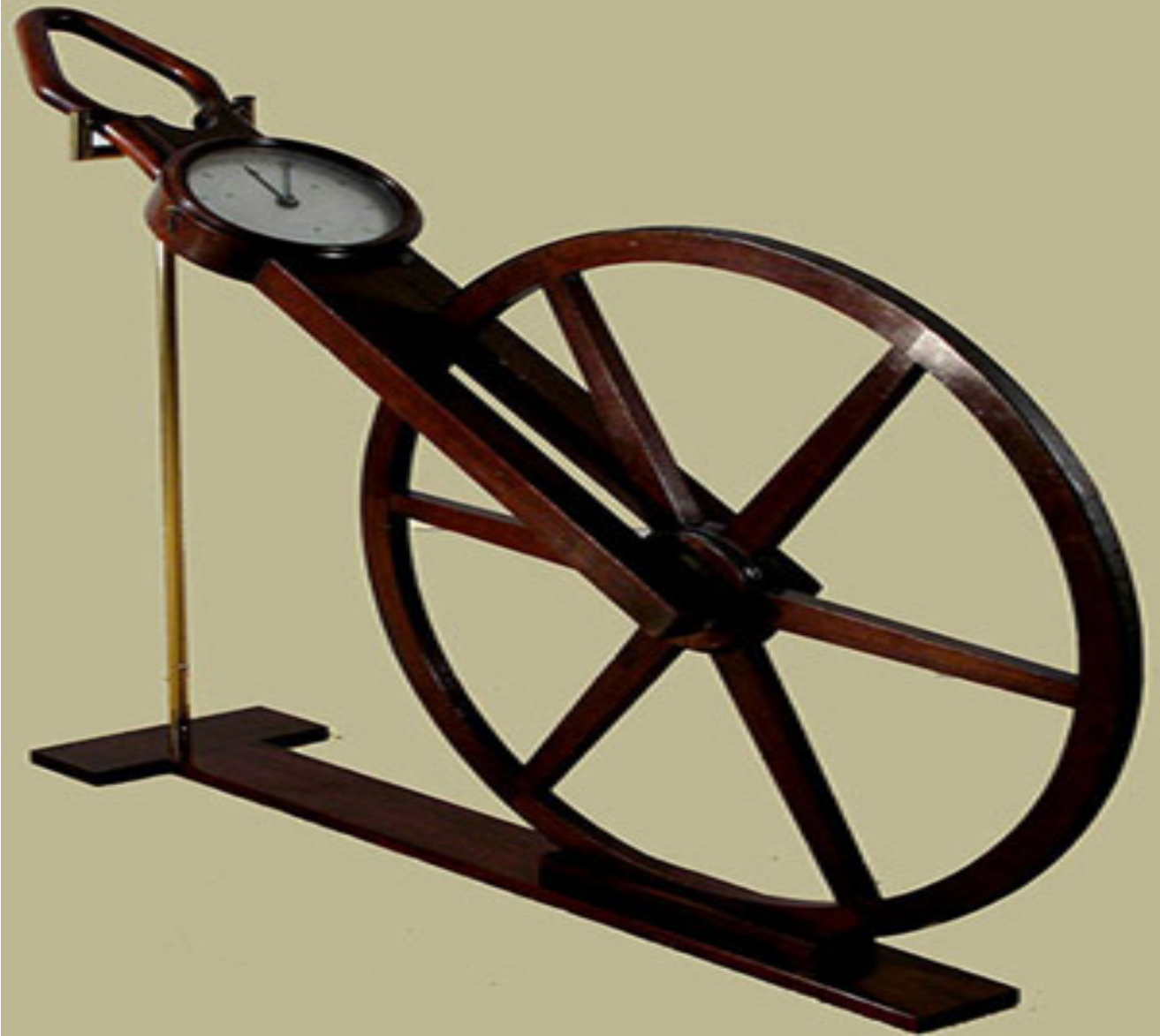
- Remote sensing
- Digital photogrammetry
- High resolution satellite imagery
- High resolution aerial photogra
- GPS Technology

Optical Total Stations



Optical Total Stations







Types of Surveying

Land Survey: The primary role of the land surveyor is to find and mark certain locations on the land. For example, they could be interested in surveying the boundary of a certain property or finding the coordinates of a specific point on the earth.

Cadastral Land Surveys: These are related to land surveys and are concerned with establishing, locating, defining or describing the legal boundaries of land parcels, often for the purpose of taxation.

Topographic Surveys: The measurement of land elevation, often with the purpose of creating contour or [topographic maps](#).

Geodetic Surveys: Geodetic surveys locate the position of objects on the earth in relation to each other, taking into account the size, shape and gravity of the earth. These three properties vary depending where on the earth's surface you are and changes need to be taken into account if you wish to survey large areas or long lines. Geodetic surveys also provide very precise coordinates that can be used as the control values for other types of surveying.

Engineering Surveying: Often referred to as construction surveying, engineering surveying involves the geometric design of engineering project, setting out the boundaries of features such as buildings, roads and pipelines.

Deformation Surveying: These surveys are intended to ascertain whether a building or object is moving. The positions of specific points on the area of interest are determined and then re-measured after a certain amount of time.

Hydrographic Surveying: This type of surveying is concerned with the physical features of rivers, lakes and oceans

. The surveys equipment is on board a moving vessel with follows pre-determined tracks to ensure the entire area is covered.

The data obtained are used to create navigational charts, determine depth and measure tide currents. Hydrographic surveying is also used for underwater construction projects such as the laying of oil pipeline