



Yildiz Technical University
Faculty of Civil Engineering
Department of Geomatic Engineering



TOPOGRAPHY (HRT3351)

Lecture Notes

Prof. Dr. Burak AKPINAR

Title	Code	Local Credit	ECTS	Lecture (hour/week)	Practical (hour/week)	Laboratory (hour/week)
Topography	HRT3351	3	4	3	0	0

Course Objectives

The aim of this course, gains required skills of basic of surveying techniques, mathematical definitions using for large scale map production.

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TOPOGRAPHY (HRT3351)

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Week	Subject
1	Introduction to Topography
2	Measurement Units and Sources of Measurement Errors
3	Types of Errors
4	Coordinate Systems and Map Projections
5	Geodetic Network Points and Distance Measurements
6	Direction Measurements
7	Traverse Computations
8	Height Measurements
9	Midterm exam 1
10	Area and Volume Computations
11	Field work
12	Field work
13	Geographic Information System, GIS
14	Midterm exam 2
15	GNSS Global Positioning Systems
16	Final exam

Week-5

Geodetic Network Points and Distance Measurements

Geodetic Control Points

Geodetic control point is defined as a point on the earth's surface, the location of which is fixed in a certain system of coordinates and altitudes on the basis of geodetic measurements.

The horizontal coordinates of a geodetic control point are determined by terrestrial methods or GPS measurements.

The vertical position (height) of a control point is determined by levelling measurements.

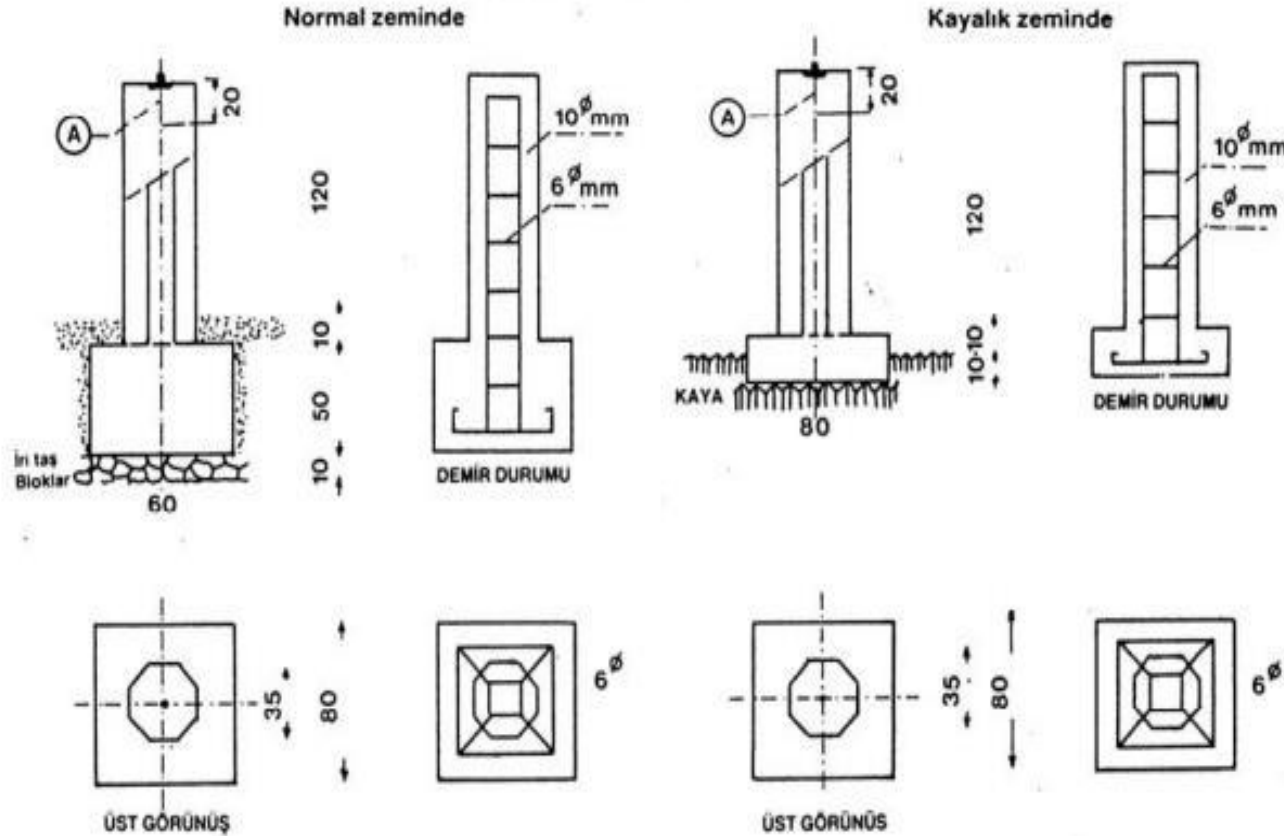


Pillar



Pillar

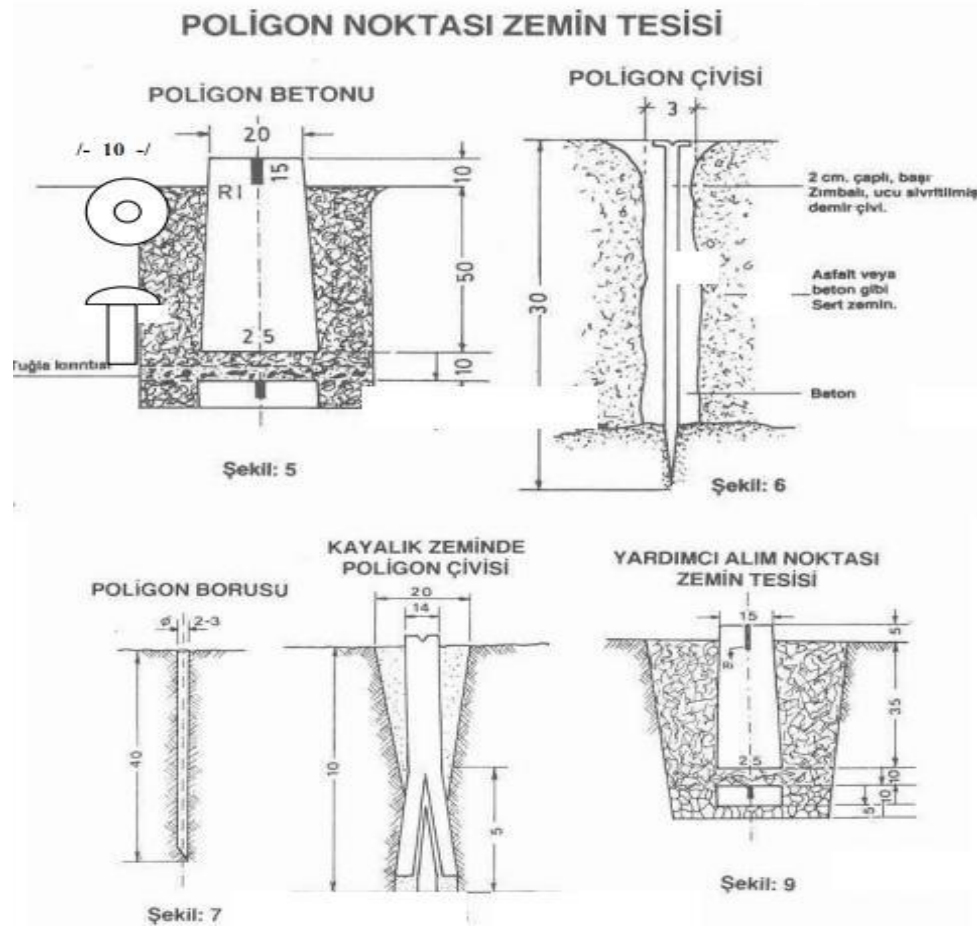
PİLYE TESİSLERİ C1 ve C2 Derece Nokta Tesisleri



(Production Regulation of Large Scale Map , 2005)



Travers Stations

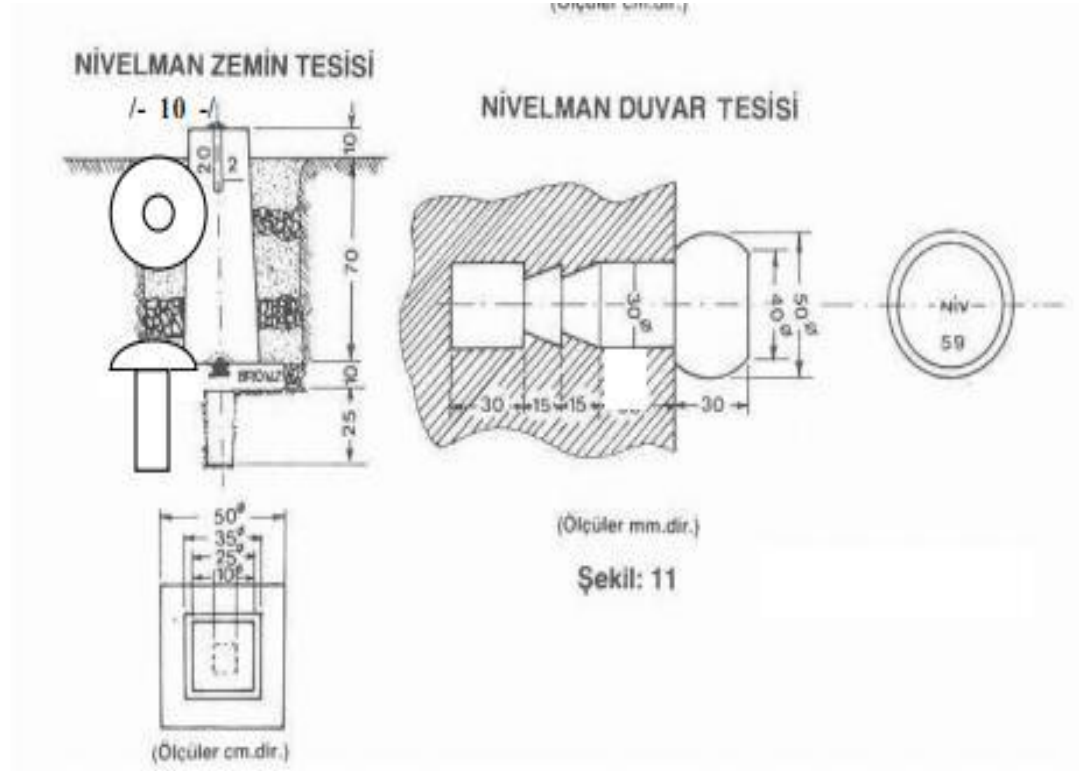


(Production Regulation of Large Scale Map , 2005)

Height Benchmarks



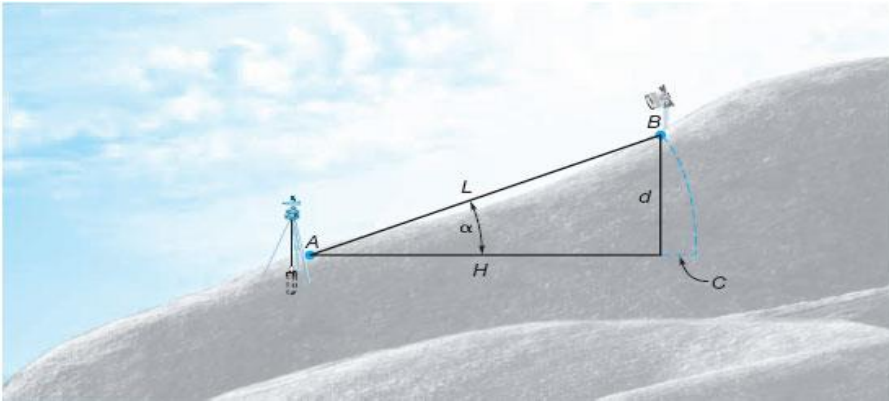
Height Benchmarks



(Production Regulation of Large Scale Map , 2005)

Distance Measurement

- In plane surveying, the distance between two points means the horizontal distance. If the points are at different elevation, the distance is the horizontal length between vertical lines at the points. In surveying, under most circumstances, all distance are presumed as horizontal distances.
- Distance between points can be also be determined using geometric or trigonometric computations working with related distance and angle measurements.



If the angle α is determined, the horizontal distance between points A and B can be computed from the relation ;

$$H = L \cos \alpha$$

H; is the horizontal distance between points,
L; is the slope length
 α ; is the vertical angle from horizontal

Distance Measurement Accessories



Steel Tape



Plumb-bob

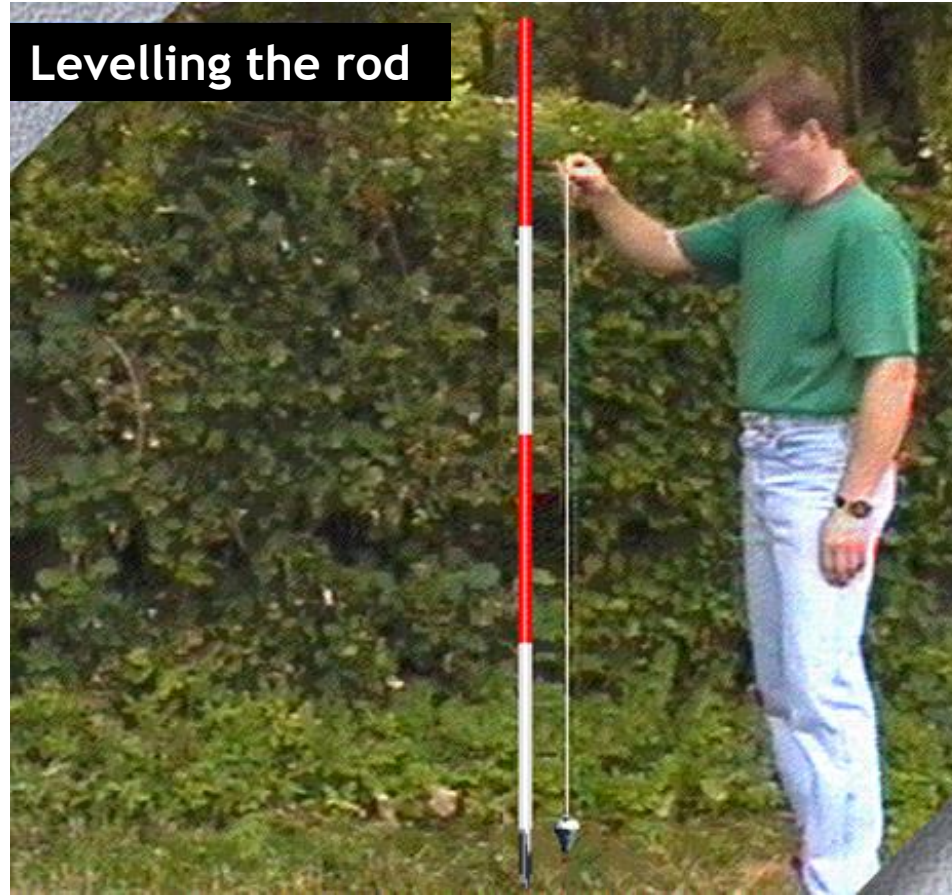


Rod

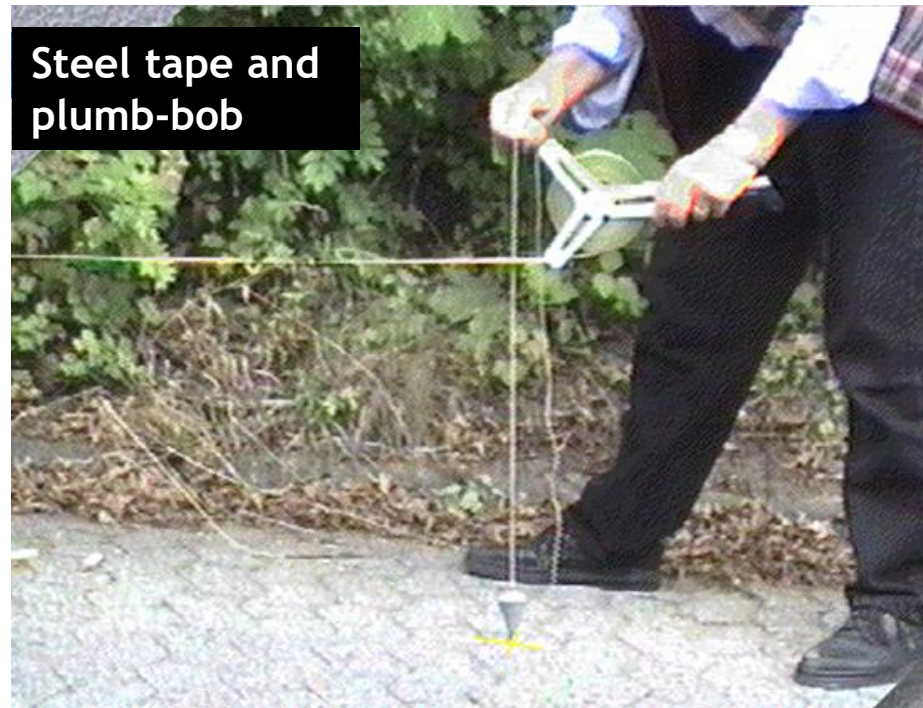


Tripod

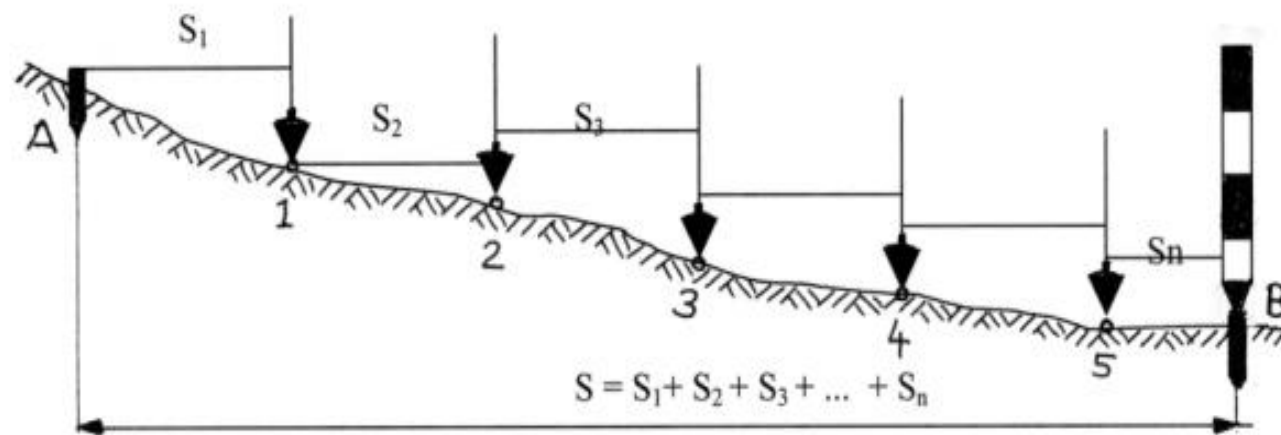
Distance Measurement Accessories



Distance Measurement Accessories



Steel tape and
plumb-bob

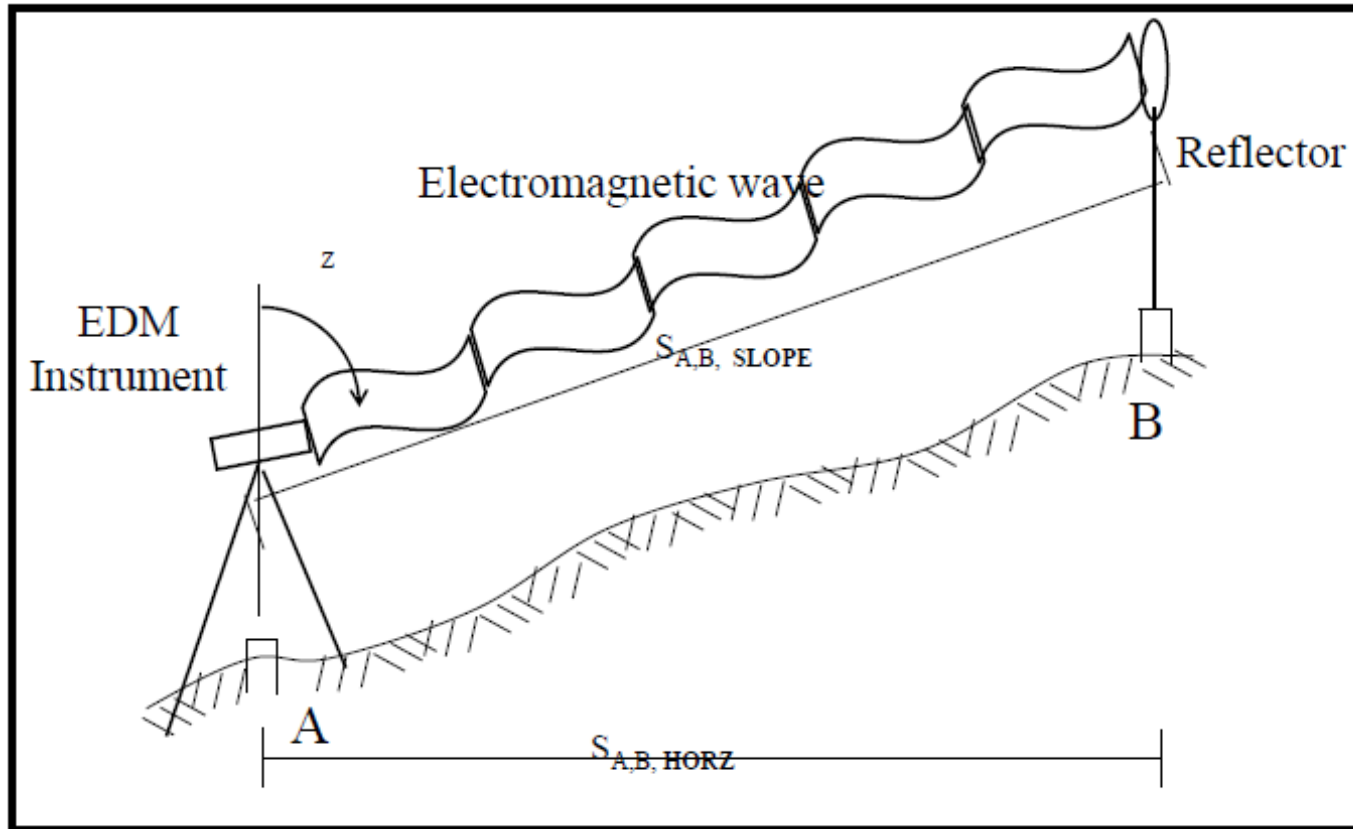


If the ground is not level, plumb-bob is used for measuring the horizontal distance.

Electronic Distance Measurement



Electronic Distance Measurement



Week-6

Direction Measurements and Geodetic Fundamental Computations