



Department of Civil and Environmental Engineering

Surveying Lab

Leveling- Introduction

Lab Number

(4)

Student Name :.....

Student Number :.....

Student Section :.....

Submission Date

...../...../.....

LAB 4: *Leveling- Introduction*

Objective:

- Get familiar with the leveling instruments and accessories.
- Get Familiar with different parts of the auto level and its functionality
- Set up the tripod and level the instrument .
- Taking reading on different staffs.

Instruments:

- Automatic level
- Staffs
- Tripods

Procedures:

A. Offsetting using Shortest Distance

- a. Get to know the parts of the level and accessories. **Figure 1**

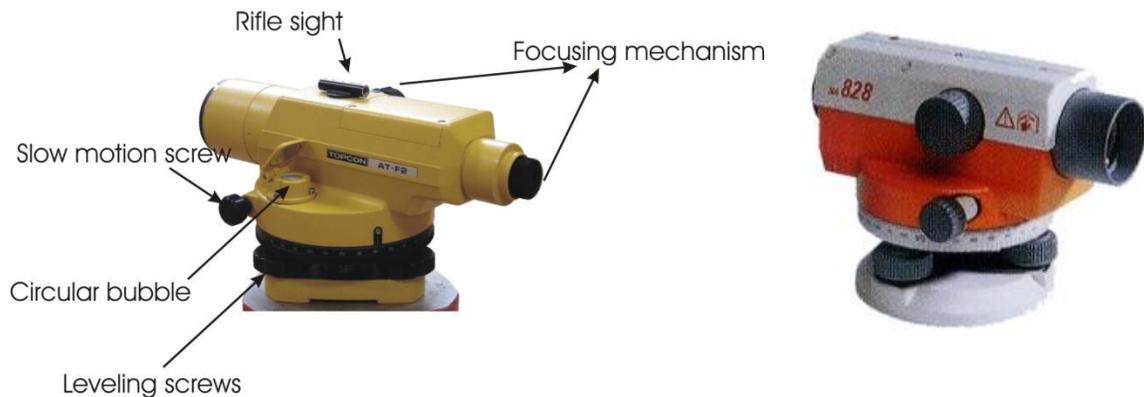


Figure 1: Automatic Level

1. Axes and telescope
2. Leveling screws
3. Circular bubble
4. Cross wires
5. Focusing mechanism
6. Rifle sight
7. Slow-motion screw
8. Tripod
9. Staff

b. Set up the tripod and level the instrument using the circular bubble

- 1) Unscrew the adjusting clamps so that a free movement up and down is allowed
- 2) Raise the tripod head to a suitable height, below your sight level and make sure that all the legs are touching the ground
- 3) Screw the adjusting clamps and spread the legs to form an equilateral triangle. If the ground is sloped, place two legs on the downhill side.
- 4) If necessary, make fine adjustments by changing the length of each leg and make sure that locking screws are well tight when finished. See Figure 2: Tripod



Figure 2: Tripod

- 5) Hold the auto level safely and place it on the tripod head
- 6) Align the Tripod Screw to the threaded hole in the auto level and tighten it
- 7) Facing the instrument, rotate both foot screws in opposite directions at the same time. Either thumbs moving inwards or thumbs moving outwards.
- 8) When the foot screws are well adjusted, the bubble will be against the side of the circular spirit level, and needs moving in to the centre
- 9) Adjust the third leveling screw to centre the bubble.

c. Measurements

- 1) Each Group (3 Student) Take 5 readings at different locations specified by the Instructor (A,B,C,D and E). Each group should set its different location of the tripod.
- 2) Record the readings, the point numbers and the name of the student who made the readings in field book.
- 3) Find the difference in reading between point (A and other points) what does the difference represent.
- 4) Find point (value) with maximum difference in elevation from Point A.
- 5) Find point (value) with minimum difference in elevation from Point A.
- 6) Compare your results with the other groups and set your conclusions.