Auto- Level

Experiments

HYDROGEOLOGY LAB

CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING

UET, LAHORE

To PERFORM TEMPORARY ADJUSTMENT OF AN AUTOMATIC LEVEL

PURPOSE

The basic purpose of this job is that how to set instrument at station point while taking measurements.

INSTRUMENT/ ACCESSORIES USED:

Auto level with tripod stand

Leveling staff

PROCEDURE:

- A suitable position is selected for setting the level.
- Fix the level on top of the tripod stand.
- Centering is to be carried out.
- Do approximate leveling by legs of tripod stand.
- After approximate leveling, perfect leveling is to be carried out by foot screws.
- Focusing the eyepiece until the cross hair can be seen clearly.
- Focusing the object glass until graduation of the staff is distinctly visible.
- Finally, the staff readings are taken.

DETERMINE THE HEIGHT, DISTANCE AND ANGLE MEASUREMENT OF TWO POINTS BY USING AUTOMATIC LEVEL

PURPOSE

The purpose of this job is to determine the height of an object, horizontal distance between instrument station and staff station and horizontal angle between any two points on the surface of earth.

INSTRUMENT/ ACCESSORIES USED:

- Auto level with tripod stand
- Leveling staff / rod
- Ranging rods

PROCEDURE

- Put leveling staff at bottom of the object whose height is to be determined and note down the staff reading.
- Invert leveling staff in such a way that it touches at the top of object and note down the staff reading then add these two readings to get height of the object.
- Put leveling staff at the desired point and note down upper and lower staff readings.
- Multiply staff intercept with multiplying constant in order to get horizontal distance between instrument station and staff station.
- Put ranging rods at points A and B.
- Sight the ranging rod at point A then rotate auto level towards point B and note down the horizontal angle at circular graduated ring.

OBSERVATIONS & CALCULATIONS:

Staff reading at the bottom = a1= ……

Invert staff reading at the top = a2 = ……..

Height of object = a1 + a2 =…….

Staff intercept = S = …….

Horizontal distance = H.D = f/ i *S

Horizontal angle at A = …….

Horizontal angle at B = …….

Horizontal angle between two points = Angle at A – Angle at B

RESULTS:

Height of object = _____ meter.

Horizontal distance between instrument station and staff station = _____ meter.

Horizontal angle between two points = ...

PRECAUTIONS:

The instrument should be levelled properly.

The readings should be taken with care from the staff rod.

There should be no parallax.

DETERMINATION OF ELEVATION OF VARIOUS POINTS WITH AUTOMATIC LEVEL BY COLLIMATION PLANE METHOD AND RISE & FALL METHOD

PURPOSE

The basic purpose of this job is to obtained data which is required for calculation of volume of earth work in road construction (LXQ CAD software).

INSTRUMENT/ ACCESSORIES USED:

- Auto level
- Levelling staff
- Measuring tape.

PROCEDURE:

- The level Instrument is set up on tripod stand.
- Set auto level at any station and set Benchmark.
- The levelling instrument is placed at suitable position.
- After temporary adjustments, the staff readings are taken at regular intervals.
- The first staff reading of any set-up is entered in the BS column, and the last in the FS column and the last in FS column. The other readings are entered in the IS column.
- RLs of different points are calculated by Rise and Fall method/ HI method.

RESULTS:

Station Pt.	B.S	I.S	F.S	Height of instrument	R.L	Remarks

Station Pt.	B.S	I.S	F.S	Rise	Fall	R.L	Remarks