SRI RAAJA RAAJAN COLLEGE OF ENGINEERING AND TECHNOLOGY
AMARAVATHIPUDUR – 630 301

Department of Civil Engineering

Date: 03.03.2022

DETAIL REPORT FOR SURVEY CAMP

1. INTRODUCTION

Surveying is an art of determining the relative positions of point on above or beneath the surface of the earth by means of angular and linear measurements. The main objective of surveying is to prepare plans and maps of areas. Thus the subject emerges out to be the most important before and during all engineering works like civil engineering works such as designing and construction of highways, water supply systems, irrigation projects, buildings etc. The B.E. Survey Camp 2022 organized by the Department of Civil Engineering, Sri Raaja Raajan College of Engineering and Technology. It is a part of the four-year Bachelor's degree in Civil Engineering course, third year first semester, carrying a total of 100 marks. The total duration of the survey camp was 05 days, from 17.08.2022 to 21.08.2022.

This is a detailed report of the works performed by the students during the camp period. It briefly explains the working procedures and techniques. In addition, it also contain the main problem faced during work and their solution, results of all calculations.

The work done during the camp duration can be categorized into:

1. Topographical survey
2. Site survey
3. Road alignment survey

2. OBJECTIVES OF SURVEY CAMP

The main objectives of the survey camp are as follows:

1. To fix Horizontal control and vertical control survey
2. To produce topographic map in coordinate system.
3. Linear segment survey practice through Road Alignment Survey.

3. ABOUT CAMP VENUE

The **Vaigai Dam** is built across the Vaigai River near Andipatti, in the Theni district of Tamil Nadu, southern India. Near the dam, the Government of Tamil Nadu has constructed an Agricultural Research Station for researching the growing of a variety of crops, including rice, sorghum, blackgram, cowpea and cotton

PRINCIPAL

Vaigai Dam measures 111 ft in height and can store water up to 71 ft, with a total storage capacity of 6,143 mcft

Vaigai Dam is maintained by Water Resources Department which in turn managed by the Tamil Nadu Public Works Department.

The dam is illuminated every Sunday as it is one of the premier picnic destinations in the region.

A significant improvement needed on the important spot of the park required on the elephant slide and painting the map model in the children park will definitely attract more visitors.

Vaigai Hydroelectric Power Plant was design capacity of 6 MW. It has 2 unit(s) of 3 MW each. The first unit was commissioned in 1990. It is operated by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO).

GIS - MAPPING

21.02.2022 - DAY 1 ACTIVITY

Name of the Experiment: Fly levelling and check levelling

Fly levelling

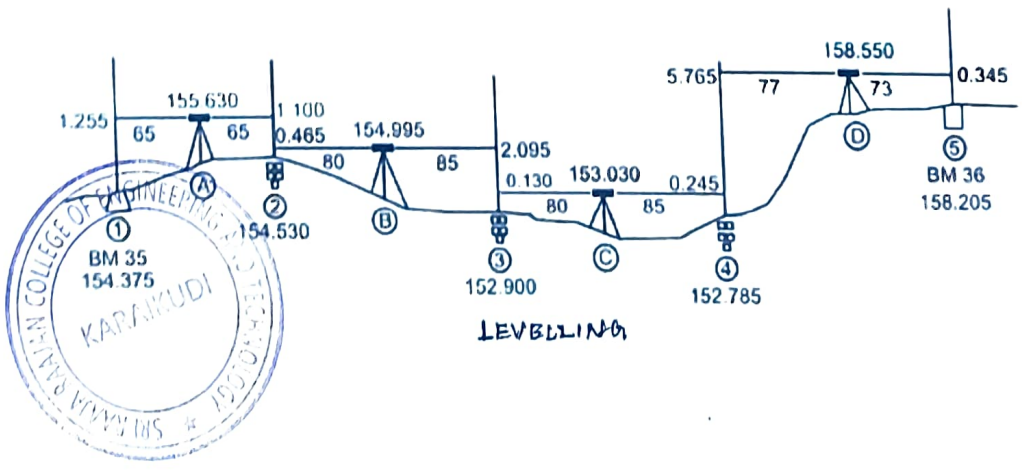
Fly levelling is a process of finding the level difference between two points and the levelling consists of taking back sights and fore sights only and not intermediate sights.

Fly levelling procedure

1. Set up the level on a firm ground and do the temporary adjustments. The instrument should be set up approximately midway between the change points.
2. Direct the telescope towards the staff, which is held vertically on the point.
3. Focus the telescope.
4. Bring the staff between the two vertical hairs.
5. Check the bubble. If it is not in the exact centre, use the screw in line with the telescope and bring it to the centre.
6. Read the staff when the horizontal hair of the diaphragm appears to cut it and record the correct reading.
7. Take the first reading on the benchmark and enter the reading in the backsight column of the field book.
8. Take fore sight-reading on the change point, if the second benchmark is far away, and enter the reading in the foresight column of the next horizontal line.
9. Shift the instrument and do all the temporary adjustments.
10. Take back sight on the same change point and enter the reading in the backsight column of the same horizontal line.
11. Take foresight reading on another change point, if the next benchmark is far away, and enter the reading in the foresight column of the next horizontal line.
12. Shift the instrument near to the next benchmark and again take readings on the change point and enter it in the backsight column of the same horizontal line.
13. Repeat the above process for a number of benchmarks.
14. If possible close the fly level at the starting point.
15. Record all the reading and data in the field book.

Check Levelling

It is conducted for the purpose of checking a series of levels, which have previously been fixed. At the end of each day's work a line of levels starting from the point and returning to the starting point of that day is run with the object of checking the work done on that day.



SURVEYING LOCATION

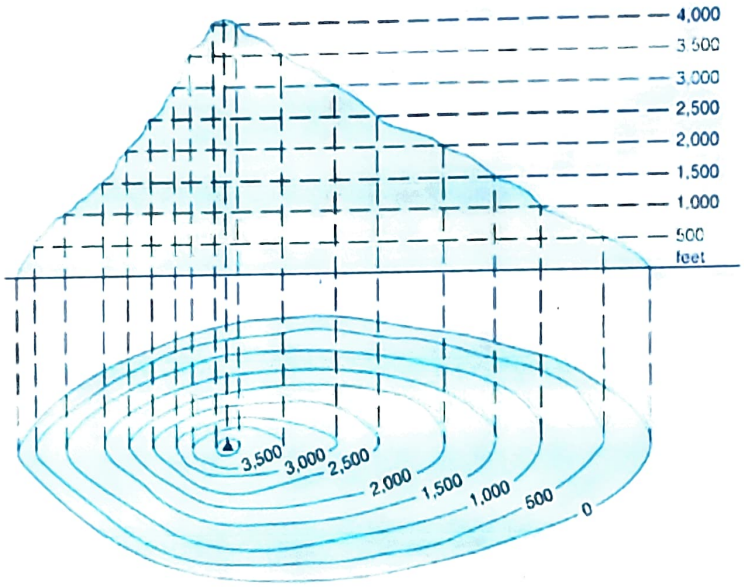
22.02.2022 - DAY 2 ACTIVITY

Radial Line Method of Contouring

The contouring small hilly areas, radial line method of contouring are run from the peak to cover the area. The guide points are taken on the radial lines and the elevations are calculated. The contour lines are then drawn by interpolation.

The following is the procedure for the radial line method of contouring:

- A benchmark is located near the peak by fly levelling from an available benchmark from a nearby site.
- Radial lines laid out from the peak conveniently to cover the area suitably.
- Staff readings are taken at some definite interval on each radial line and the elevations of the stations are determined.
- The contours of the required elevations are determined by interpolation.



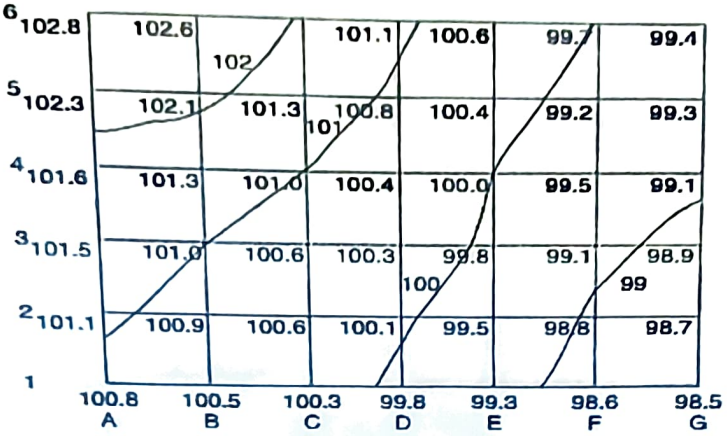
Radial Line Method of Contouring

Grid Method of Contouring

The grid method of contouring is used when the area is not very large and where the ground is not very much undulating.

The following procedure is adopted for the grid method of contouring:

- The area is dived into squares of regionable directions. Usually, 5m to 20m squares are adopted. The dimensions of the squares depend upon the nature of the ground and the number of the contour lines of required.
- The staff readings are taken at the corners of the squares only.
- Once the levels are available, the contours of different elevations are determined by interpolation.



Grid Method of Contouring

SURVEYING - VENUE

VAIGAI DAM

23.02.2022 - DAY 3 ACTIVITY

Rain index and evaporation loss measurements

A **rain gauge** (also known as **udometer, pluvia metior, pluviometer, ombrometer,** and **hyetometer**) is an instrument used by meteorologists and hydrologists to gather and measure the amount of liquid precipitation over a predefined area, over a period of time. It is used for determining the depth of precipitation (usually in mm) that occurs over a unit area and thus measuring rainfall amount.

An **evaporation pan** is used to hold water during observations for the determination of the quantity of evaporation at a given location. Such pans are of varying sizes and shapes, the most commonly used being circular or square. The best known of the pans are the "Class A" evaporation pan and the "Sunken Colorado Pan".In Europe, India and South Africa, a Symon's Pan (or sometimes Symon's Tank) is used. Often the evaporation pans are automated with water level sensors and a small weather station is located nearby.

Evaporation is measured daily as the depth of water (in inches) evaporates from the pan. The measurement day begins with the pan filled to exactly two inches (5 cm) from the pan top. At the end of 24 hours, the amount of water to refill the pan to exactly two inches from its top is measured.

If precipitation occurs in the 24-hour period, it is taken into account in calculating the evaporation. Sometimes precipitation is greater than evaporation, and measured increments of water must be dipped from the pan. Evaporation cannot be measured in a Class A pan when the pan's water surface is frozen.

The Class A Evaporation Pan is of limited use on days with rainfall events of >30mm (203mm rain gauge) unless it is emptied more than once per 24hours. Analysis of the daily rainfall and evaporation readings in areas with regular heavy rainfall events shows that almost without fail, on days with rainfall in excess of 30mm (203mm Rain Gauge) the daily evaporation is spuriously higher than other days in the same month where conditions more receptive to evaporation prevailed.

The most common and obvious error is in daily rainfall events of >55mm (203mm rain gauge) where the Class A Evaporation pan will likely overflow.

The less obvious, and therefore more concerning, is the influence of heavy or intense rainfall causing spuriously high daily evaporation totals without obvious overflow.

Single plane method

Trigonometry is the process of determining the differences of elevation of the stations from observed vertical angles and known horizontal distance either measured directly or computed trigonometrically.

Procedure:

1. Set up the theodolite at A, level it carefully and observe the angle of elevation a_1.
2. Set the vertical vernier to zero, and take a reading on a staff held vertically on a BM. Let it be S1
3. Transit the telescope, so that the line of sight is reversed.
4. Mark a point B in the line of sight at a convenient distance d, Measure it accurately,

5. Shift the theodolite to the point B, Centre it and level it. Observe the angle of elevation a_2
6. Set the vertical vernier to zero and take again a B.M., reading as S2.

Double plane method

Procedure:

1. Let the given point is "B"
2. Set up the theodolite station A, centre it carefully and fix the ranging rod at C of known distance "d"
3. Measure horizontal angles BAC, Let it be q_1, in angles BAC should be individually equal to 30° to 75°.
4. Sight 'B' the top of the object and observe the angle of elevation a_1 ensuring that altitude bubble is center of its run.
5. Setting the vertical vernier to zero take a reading on a staff held vertically on a benchmark. Let the reading be S_1.
6. Shift the theodolite the station C at a known distance 'd' and centre it over the mark and observe that the horizontal angle BCA. Let it be q_2.
7. Sight 'B' the top of the object and observe the angle of elevation a_2, ensuring that the altitude bubble is central of its run.
8. Setting up the vertical vernier to zero takes a reading on a staff on the same benchmark. Let it be S_2.
9. Measure the horizontal distance 'd' between stations A and C.

RAIN GAUGE

SRI RAAJA RAAJAN COLLEGE OF ENGINEERING AND TECHNOLOGY
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SURVEY CAMP

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12	912520103314	Kartheeswaran E	
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