Engineering Surveying -1 CE212 Contouring Lectures

Lecture
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Contour

An Imaginary line on the ground surface joining the points of equal elevation is known as contour.

In other words, Contour is a line in which the ground surface is intersected by a level surface obtained by joining points of equal elevation. This line on the map represents a contour and is called Contour line.

A map showing Contour Lines is known as Contour Map.
Contouring

• The process of tracing contour lines on the surface of the earth is called Contouring.
Purposes of Contouring

Contour survey is carried out at the starting of any engineering project such as a road, a railway, a canal, a dam, a building etc.

1. For preparing contour maps in order to select the most economical or suitable site.
2. To locate the alignment of a canal so that it should follow a ridge line.
3. To mark the alignment of roads and railways so that the quantity of earthwork both in cutting and filling should be minimum.
4. For getting information about the ground whether it is flat, undulating or mountainous.
5. To locate the physical features of the ground such as a pond depression, hill, steep or small slopes.
Contour Interval & Horizontal Equivalent

**Contour Interval**: The constant vertical distance between two consecutive contours is called the contour interval.

**Horizontal Equivalent**: The horizontal distance between any two adjacent contours is called as horizontal equivalent.

The contour interval is constant between the consecutive contours while the horizontal equivalent is variable and depends upon the slope of the ground.
Characteristics of Contours

1. All points in a contour line have the same elevation.

2. Flat ground is indicated where the contours are widely separated and steep-slope where they run close together.

3. A uniform slope is indicated when the contour lines are uniformly spaced and

4. A plane surface when they are straight, parallel and equally spaced.

5. A series of closed contour lines on the map represent a hill, if the higher values are inside
Characteristics of Contours

6. A series of closed contour lines on the map indicate a depression if the higher values are outside
Characteristics of Contours

7. Contour line cross ridge or valley line at right angles.
If the higher values are inside the bend or loop in the contour, it indicates a Ridge.
If the higher values are outside the bend, it represents a Valley.
Characteristics of Contours

8. Contour lines cannot merge or cross one another on map except in the case of an overhanging cliff.

9. Contour lines never run into one another except in the case of a vertical cliff. In this case, several contours coincide and the horizontal equivalent becomes zero.
METHODS OF CONTOURING

There are mainly two methods of locating contours:-
(1) Direct Method and (2) Indirect Method.

Direct Method:
In this method, the contours to be located are directly traced out in the field by locating and marking a number of points on each contour. These points are then surveyed and plotted on plan and the contours drawn through them.
METHODS OF CONTOURING

Indirect Contouring:

In this method the points located and surveyed are not necessarily on the contour lines but the spot levels are taken along the series of lines laid out over the area. The spot levels of the several representative points representing hills, depressions, ridge and valley lines and the changes in the slope all over the area to be contoured are also observed. Their positions are then plotted on the plan and the contours drawn by interpolation. This method of contouring is also known as contouring by spot levels.
Comparison of Direct and Indirect Contouring

<table>
<thead>
<tr>
<th>Direct Method</th>
<th>Indirect Method</th>
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<tbody>
<tr>
<td>Most accurate but slow and tedious</td>
<td>Not so accurate but rapid and less tedious</td>
</tr>
<tr>
<td>Expensive</td>
<td>Cheaper</td>
</tr>
<tr>
<td>Not suitable for hilly area</td>
<td>Suitable for hilly area</td>
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<tr>
<td>During the work calculations can be done</td>
<td>Calculations are not required in the field</td>
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<tr>
<td>Calculations can not be checked after Contouring</td>
<td>Calculation can be checked as and when required</td>
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</tbody>
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Thank you