CONTOUR CONTOUR TRENCH (CCT)

What?

Contour trenching is excavating trenches along a uniform level across the slope without any interruption.

Why?

- Slowing down the velocity of runoff
- Checking soil erosion
- Improving local soil moisture profile
- **Where?**
- In areas where there is an abundance of trees and vegetation, gaps in excavation are in any case essential to allow space for the roots of the trees to spread. In areas where slopes are in between 10 to 25 % and low rainfall.
- **How?**
- Design: Size of trench depends on the depth of soil and also on some other factors of watershed. In general, the most popular size has been used in the many watersheds is with a depth of 50 cm and a width of 50 cm.
- Berm: The mud excavated is piled up 20 cm away, downstream of the trench. This gap between the trench and mud is called the berm. This distance is essential so that this mud does not fill up the trench again.
- Plantation: If grass has to be planted along the trenches, then the excavated mud should be piled up in a 10cm. high rectangular layer. If trees have to be planted, they should be planted either in the space after the trench or on either side of the trench
- How much of the rainfall do we want to catch
- What length of trenches should there be to catch this amount

Continuous Contour Trenches: Step-by-Step:

1. Measure the slope in one section of the ridge area. Ensure that it is between 10 - 25%
2. Draw a straight line with wet lime between the highest and the lowest points along the slope
3. Decide the interval between successive lines of trenches
4. On the straight line, marks points at the decided interval

5. Starting from each mark, demarcate the contour line
6. Dig continuous trenches along these contour lines
7. Depending on the specific conditions (such as thick vegetation, rocks etc.),leave gaps in the excavation from place to place

Continuous Contour Trenches: Don'ts

1. Do not make trenches on slopes higher than 25%. Instead adopt vegetative measures
2. Do not make trenches on slopes less than 10%. Instead construct contour bunds
3. Do not excavate trenches where there is already dense vegetation
4. Do not plant inside the trench
5. Do not excavate if roots of a tree are encountered
6. Do not excavate trenches across large streams or drainage lines

Design Example

(Q). Design Continuous contour trenches in a 25 hectare area. The run-off coefficient of this area is 0.40. The daily quantum of rainfall is 100 mm and only 75 % of the run-off has to be stored in the trenches. Each trench gets filled twice in a day. The longest section of the ridge area is 2500m.

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(1) Find out the quantum of runoff

Q= CRA

Where Q = Runoff in cu.m

C = Coefficient of runoff

R = Daily rainfall in meters

A = Area taken up for design in Square meters

Given data:

C= 0.40

R= 100 mm = 0.10m

A= 25 ha x 10000 sq, m per ha = 250000 sq.m

Q = CRA = 0.40X0.10X250000 = 10000 cu.m

Since the contour trench has to catch only 75 % of the run-off then

Qd = 10000x 75/100 = 7500 cu.m

Qd is design runoff

(2) Find out number of contour trenches required

Usually a contour trench is made 0.5 m wide and 0.5 m deep.

Cross-sectional area of continuous contour trench= Ac = 0.5 * 0.5 = 0.25 sq.m

Since this trench gets filled twice in a day, length of contour trenches = L = Qd / (Ac * 2)

= 7500/ (0.25 * 2) = 7500 / 0.50 = 15000 m

(3) Find out distance between successive rows of contour trenches (d)

d = A/L = Area taken up for design in square meters / Total length of contour trenches

= 250000/ 15000 = 16.67 m

(4) Find out number of rows of contour trenches (N)

N= Length of the longest section of ridge area (L) / Distance between successive rows of contour trenches (d)

N= L/d = 2500/16.67 = 150