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Soil-Water Conservation Engineering and Structures

Presented By-

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PERCOLATION POND

- ❖ A percolation pond is a small water storage structure constructed across a water body to harvest the runoff from the catchment and impounded for a longer time thereby recharging ground water storage in the zone of influence of pond .
- ❖ Such ponds are very useful in harvesting the unutilized balance of the surface flow during period of availability and conserving it in the underground reservoirs.
- ❖ It has been observed that the percolation ponds are effective up to a distance of 1000 meters on the downstream side and wells within this range are benefited with more replenishment of water.



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SITE SELECTION

- ❖ The site should be such that largest storage volume is available with the least amount of earth fill .
- ❖ A narrow section of the valley with steep sides slopes is preferable . It is important as the cost of construction as well as the utility of the pond depend upon the site .
- ❖ Percolation ponds are found in abundant in **Tamil Nadu , Andhra Pradesh , Gujarat , Karnataka.**



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DESIGN AND CONSTRUCTION

- Capacity of the percolation tank has to be calculated on the basis of the rainfall and catchment area of the tank . Also the weir length to be calculated . The procedure is as follows;
- Select the site for the percolation pond
- A percolation pond was constructed at VES location.
- An approximate slope of 45degree was maintained for the sides of the pond .
- A wired fence was erected at a distance of 2.5m around the pond to prevent unauthorized entry of people and to keep the instruments safe.
- Three piezometers namely , P1 , P2 , P3 with diameter of 0.2m each, distance of seperation of 0.5 m and respective depths of 2, 4 and 6m were constructed .
- From the toposheet , find out the correct catchment area of the watershed at that location .
- Compute catchment yield from rainfall and runoff coefficient or strange's table .



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- Make suitable assumptions such as number of fillings per year, utilization of yield per filling etc.
- Development of stage –capacity curve ; - Draw the contour lines at every 50cm interval between the bed level and highest ground level at the site . From these contour lines , the capacity of the tank at 0.5m, 1.0m, 1.5m, 2.0m, height above the bed level is calculated.
- Compute full tank level from stage-capacity curve.



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DESIGN CONSIDERATIONS OF NALA BUNDS

- Nala bunds are embankments constructed across nalas for checking velocity of runoff , increasing water percolation and improving soil moisture regime. In fact nala bunds and percolation tanks both terms are synonymous but still they are being called differently at different places.
- The water stored in these structures is mostly confined to stream course and the height is normally less than 2m. These are designed based on stream width and excess water is allowed to flow over the wall. Nala bunds are constructed across bigger streams of second order in areas having gentler slopes.
- The width of nala bed should be atleast 5 meters and not exceed 15 meters and the depth should not be less than 1 meter.
- The soil downstream of the bund should not be prone to water logging and should have pH between 6.5 to 8 .