

ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY



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COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE and affiliated to Anna University, (An ISO Certified Institution)

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DEPARTMENT OF AGRICULTURAL ENGINEERING

AI3402 SOIL AND WATER CONSERVATION ENGINEERING

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AI3402 SOIL AND WATER CONSERVATION ENGINEERING

2.1.1 Farm Ponds

Farm ponds are small tanks or reservoirs constructed for the purpose of storing water essentially from surface water. Farm ponds are useful for irrigation, water supply for the cattle, fish production, etc. Farm ponds have a significant role in areas of rainfed agriculture. They are used for storing water during the rainy season and using the same for irrigation subsequently.

2.1.1.1 Components of a Farm Pond:

The pond consists of the storage area, earthen dam, mechanical spillway and an emergency spillway. The mechanical spillway is used for letting out the excess water from the pond and also as an outlet for taking out the water for irrigation. The emergency spillway is to safeguard the farm pond from overtopping when there are inflows higher than the designed values.

2.1.1.2 Design of Farm Pond

The design of farm ponds consists of

- (1) Selection of site
- (2) Determination of the capacity of the pond
- (3) Design of the embankment
- (4) Design of the mechanical spillway
- (5) Design of the emergency spillway
- (6) Providing for seepage control from the bottom



Construction of farm pond

Selection of suitable site for the pond is important as the cost of

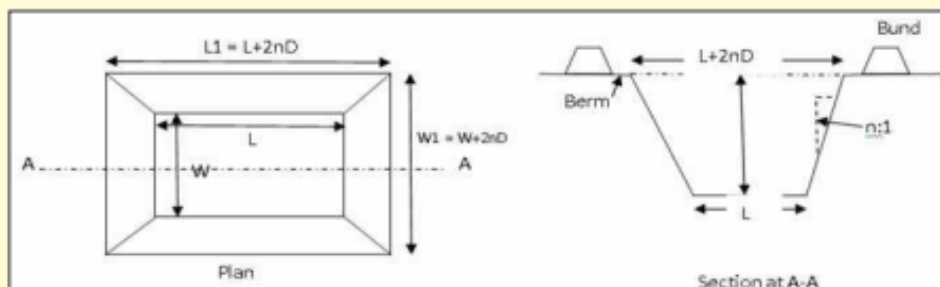


Figure: Cross section of the dug out pond

construction as well as the utility of the pond depend upon the site. The site for the pond is to be selected keeping in view the following considerations:

1. 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.
2. Large areas of shallow water should be avoided as these will cause excessive evaporation losses and also cause water weeds to grow.
3. The site should not cause excessive seepage losses.
4. The pond should be located as near as possible to the area where the water will be used. When the water is to be used for irrigation, gravity flow to the areas to be irrigated is preferable.

The capacity of the pond is determined from a contour survey of the site at which the pond is to be located. From the contour plan of the site the capacity is calculated for different stages using the trapezoidal or Simpson's rule.

2.1.1.3 Depth and Side Slope

The depth of the farm pond is decided by considering soil depth, soil type and equipment used in excavation. Though, the evaporation loss component can be minimized by increasing the depth but, from practical point of view the ideal depth is limited to 3 to 3.5 meter. Any depth beyond 4.0 meter will be uneconomical if human labour is employed in excavation.

Based on experience, it is observed that the side slope of the pond should not be steeper than the natural angle of repose of the excavated material. Another factor while considering the side slope is duration of standing of water in the farm pond. For higher duration, flatter side slope is recommended to avoid the slippage due to saturation particularly for unlined pond.



Farm ponds