

When contracting for a dug seepage pond, obtain written agreement from the contractor as to the water depth that will be achieved. Contracting for a certain pit depth will do little good if the water doesn't rise sufficiently in it. Again, 15 feet or more depth during the low point of summer water levels is advisable, if soil conditions permit.

The type of equipment that is best for digging ponds depends largely upon pond size, site characteristics, and depth desired. Draglines or bulldozers are generally used. Bulldozers are more adapted to the dryer pond beds.

The material dug out of the pond, called the "spoil," should be smoothed back away from the pond edge or piled far enough from the pond that it won't erode back into the water. Using some of the spoil to build a gentle berm around the pond can be helpful in diverting unwanted overland runoff away.

Ponds dug by draglines are seldom wider than about 90 feet but

may be much longer. Excavation width is governed by the distance a dragline can move back before it is blocked by its spoil piles—unless the spoil can be moved.

Impoundments

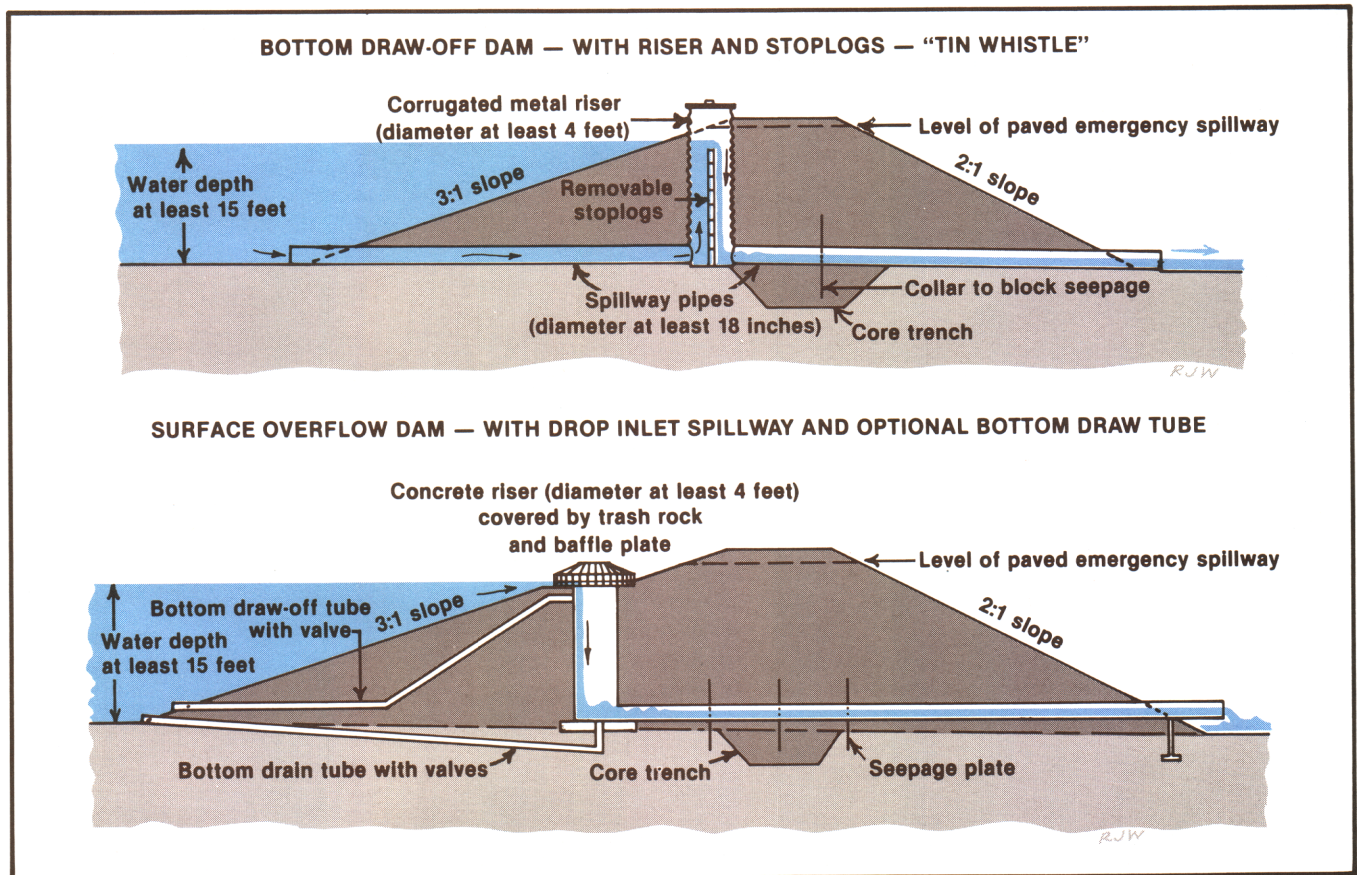
In "embankment" or "fill-type" ponds, water is impounded by an earthen dam containing a core of watertight material. Such ponds are suited to areas where slopes range from gentle to steep. It is best to have a site where a great volume of water can be stored by only a small amount of embankment fill. The ideal location is where the valley is narrow at the damsite, and the pond area is wide and flat but with steep sides.

For fishing ponds, avoid sites where the impoundment will have large areas of shallow water. There, evaporation losses will be greater, and aquatic plants will be more numerous. Also, avoid sites where there is flooding.

Wave erosion on the dam embankment can be a problem in large ponds. Try to choose a site where the prevailing wind doesn't blow along the length of the pond toward the dam.

A properly designed impoundment will have two outlets for the water—a trickle tube or mechanical spillway and a vegetated earthen emergency spillway. The emergency spillway is for flood flows.

As in the case of dug ponds, it will be best for fish if the water supply is from groundwater rather than from runoff. If, however, the impoundment must be designed to catch runoff water, the pond must be located so that its drainage basin is large enough to provide sufficient runoff to fill it—and to maintain it in the face of evaporation and seepage losses. Calculate surface runoff according to the area of land draining into the pond, amount of precipitation, and runoff characteristics involving land slope and porosity, vegetation, and human distur-



Two common types of outlet structures for dams that form fish ponds. Riser-and-stoplog construction is the simplest design that allows controlled bottom draw-off. A drop-inlet spillway can accommodate greater variation of flow. It is needed where run-off from large land area supplies the pond and where sudden high water is expected.