

ENGINEERING STANDARD

FOR

552-B - IRRIGATION PIT OR REGULATING RESERVOIR (NO.)
(Regulating Reservoir)

Definition

Small storage reservoir constructed to regulate or store the supply of water available to the irrigator.

Scope

This standard applies to reservoirs created by impounding structures and pits excavated below ground surface for the short-period storage of either diverted surface waters or waters from pumped or flowing wells or water from an irrigation delivery system.

Regulating reservoirs created by earth embankments shall be within the scope of the standard for Ponds (378). This standard also applies to concrete and steel regulating reservoirs used to collect water from two or more small irrigation wells for application with a sprinkler or drip irrigation system.

This standard establishes the minimum acceptable quality level for the planning and functional design of irrigation regulating reservoirs. It does not include detailed design criteria or construction specifications for individual reservoirs or components of the regulating facility.

Purpose

To store water for relatively short periods of time to:

1. Provide for the regulation of fluctuating flows in streams or canals.
2. Provide suitable (usually larger) irrigation streams.
3. Provide for improved management of irrigation water.
4. Provide more efficient use of available labor.
5. Avoid nighttime operation, and
6. Provide storage for reuse irrigation systems.

Conditions Where Practice Applies

This practice applies only to sites meeting all of the following criteria and conditions:

1. The existing available irrigation stream is of such a size that regulation is necessary to accomplish the intended purposes. For small irrigation wells, collection facilities are needed for more efficient operation of pumping plants.
2. Water must be stored to be used between times of rotation deliveries.
3. An adequate and dependable volume of good quality water is or can be made available.
4. Topographic, geologic, and soils conditions are suitable for the practical construction of a regulating reservoir with an adequate storage capacity. Pervious soils encountered in the reservoir area can be sealed to such degree that seepage losses will not be excessive.
5. Where surface runoff enters the reservoir, the contributing drainage area is or can be protected against erosion to the extent that normal sedimentation will not materially shorten the planned life of the reservoir.
6. The owner will have, or be able to obtain, a valid right to use the water.

Design Criteria

Compliance with State Laws

The design, construction, and registration of all regulating reservoirs shall be in strict compliance with all State water laws and regulations pertaining thereto.

Capacity Requirements

Irrigation regulating reservoirs shall have a usable capacity sufficient to permit the existing irrigation stream to be regulated so that irrigation water may be applied with a reasonably high efficiency. In computing capacity requirements, due consideration shall be given where applicable to diverted inflow, surface runoff, precipitation, evaporation, and seepage. Excessive seepage losses shall be prevented by the use of an adapted method of sealing or lining. Additional capacity shall be provided as necessary for sediment storage.

Capacity requirements for regulating reservoirs used as part of a system for collecting water from two or more small wells shall be based on the discharge capacities of the contributing wells and on the operation frequency of the sprinkler system.

Reservoir Design

For impounding structures, the foundation, the embankment, and all needed related appurtenances shall be designed to comply with the standard for Pond (378) and with other SCS standards applicable to the type and class of structure involved. Concrete and steel regulating reservoirs shall be designed according to the standard for Troughs or Tanks.

Inlet Protection

Where the inflow enters the reservoir, the side slope of the reservoir shall be protected against erosion by the use of a pipe inlet or some other suitable structure. The capacity of the inlet structure shall be no less than that required to accommodate the maximum anticipated rate of inflow.

Overflow Protection

A trickle tube, pipe drop inlet, or other suitable device shall be provided for the protection against overflow resulting from flows of long duration. The capacity of the overflow structure shall be at least equal to the normal inflow stream. Overflow protection structures may be designed and installed in combination with the outlet works.

Outlet Works

Outlet works shall be provided for the controlled release of irrigation water. The outlet works may consist of a gated conduit through or over the embankment for gravity flow to the irrigated area or to a pumping plant. They may also consist of a pumping plant designed to lift water directly from the reservoir basin. The capacity of the outlet works shall be no less than that required to meet peak period irrigation system demand.

Side Slopes

Side slopes of excavated regulating reservoirs shall be no steeper than those required to maintain slope stability in the type of material encountered, and in no case shall they be steeper than 1 horizontal to 1 vertical.

Placement of Waste Material

In the case of excavated regulating reservoirs, the waste material shall be placed or disposed of in such a manner that its weight will not endanger the stability of the side slopes and where it will not be washed back into the reservoir as a result of rainfall. To accomplish these objectives, the waste material may be placed in one of the following ways:

1. Uniformly spread to a height not exceeding 3 feet with the top surface graded to a continuous slope away from the reservoir. In such cases, no berm is required.
2. Uniformly stack to a depth of 3 feet with side slopes assuming the natural angle of repose for the excavated material behind a berm equal in width to the maximum depth of the reservoir but not less than 12 feet.
3. Haul from the site.

Vegetation

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Vegetation shall be established on all exposed surfaces of the embankment, the excavated pit or regulating reservoir, spillway, borrow area, and spoil areas. Where drainage area around the pit or reservoir is not protected by sod or other permanent vegetation, a vegetative strip of not less than 30 feet in width shall be provided around the pond. Vegetative treatment shall be applied in accordance with Field Office Technical Guide for Critical Area Planting (342).

References: National Engineering Field Manual for Conservation Practices
-Ponds and Reservoirs
National Engineering Handbooks

CONSTRUCTION SPECIFICATION

FOR

552-B - REGULATING RESERVOIR

Scope

All designs and plans will be in keeping with the standard for irrigation regulating reservoirs and will describe the requirements for proper installation of the practice to achieve its intended purpose. Construction operations shall be done in such a manner that erosion, air, water, and noise pollution will be minimized and held within the legal limits as established by State regulations.

Construction

Irrigation regulating reservoirs shall be constructed to achieve its intended purpose. Construction of structures within the scope of Technical Release No. 60 shall be in accord with the guide specifications contained in the specifications for contracts, SCS, South.

Structures below the scope of Technical Release No. 60 shall be applied under the construction specifications applicable to ponds, (Code 378) or have specifications prepared by the Area Engineer.

Construction specifications for excavated pond (Code 378) shall apply for excavated irrigation regulating reservoirs.

Completed jobs shall be workmanlike and present a good appearance.

Vegetation

Vegetation treatment shall be established or specified or as shown on the plans. Vegetation shall be applied as a critical area planting and will include seedbed preparation, seeding, liming, fertilizing and, when needed, mulching. When specified, the fill slopes, spillway, spoil area and ramp shall be fenced to provide protection to the pond and vegetation.