NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

DAM, FLOODWATER RETARDING

(No. and Acre-Feet)

CODE 402

DEFINITION

A single-purpose structure providing for temporary storage of floodwater and for its controlled release.

SCOPE

This standard covers dams constructed to retard floodwater.

PURPOSE

Floodwater-retarding structures are installed to reduce flood damages downstream by controlling the release rate from flood flows of predetermined frequencies. They may also permit the use of more economical channel improvements or stabilizing structures in the channel downstream and reduce environmental hazards and pollution.

CONDITIONS WHERE PRACTICE APPLIES

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

- Topographic, geologic, and soils conditions at the proposed site are satisfactory for the development of a feasible dam and reservoir.
- The drainage area above the pond must have not less than 50 percent land adequately protected against erosion to the extent that expected sedimentation will not shorten the planned effective life of the structure. Refer to SEDIMENT BASIN (350) in Section IV of the Field Office Tech Guide.

DESIGN CRITERIA

All dams designed under this standard shall meet or exceed the criteria for PONDS (378) or TR-60, as appropriate, except as specifically modified by this standard.

Storage Requirements

The total storage shall include the combined floodwater storage requirements and the sediment storage requirements.

Floodwater Storage Requirements

The retarding storage requirements shall be sufficient to contain the runoff expected to occur at a frequency consistent with the level of protection to be provided to the downstream-benefited area, with proper allowance made for discharge through the principal spillway. The minimum volume to be controlled will be computed using the 24-hour duration storm for PONDS (378) or 1-day/10-day duration storms for TR-60 for the frequency selected.

Sediment Storage Requirements

The sediment storage volume to be provided shall be not less than the expected sediment accumulation during the design life. Principles and criteria specified in Engineering Field Manual Chapter 2A, or Technical Release 12 and 51, shall be followed in determining this volume.

The elevation of the crest of the lowest stage of the principal spillway shall be set at the elevation of the sediment pool. For dry dams, the riser shall be designed to permit design discharge at the sediment pool elevation with provisions for discharging water at lower elevations to satisfy the functional requirements of the structure.

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However, 15 percent or less of the total volume of sediment may be stored above the riser crest or opening as aerated sediment and this volume must be deducted from the storage available for floodwater storage.

The installation of gates, ports, or drawdown pipes at an elevation below the elevation of the sediment pool for the purpose of reducing the conservation pool size or for legal requirements will not be considered to reduce the sediment and detention volume requirements.

Principal Spillway

The capacity of the principal spillway shall be adequate to discharge, in 10 days or less, the floodwater storage needed to provide the desired level of protection to the downstream benefited area. Storage provided primarily for the purpose of reducing the frequency of use of the emergency spillway need not be included in this 10-day drawdown limitation. The determination of capacity must be based on consideration of the benefits that accrue to the reduction in the discharge rate, damages that may result from prolonged storage in the retarding pool, damages that may result from prolonged outflow, and limitations in water rights or other legal requirements. The discharge through gated outlets shall not be considered in determining the emptying time of the retarding pool. The minimum diameter of a conduit used for a principal spillway shall be 10 inches.

All parts of the principal spillway, except attached gates and trash racks, shall have an expected service life equal to or greater than the design life of the structure or provisions made for replacement. Materials for principal spillways shall meet the requirements for PONDS (378) or TR-60, as appropriate.

Structural Features

For all other components or structural requirements including freeboard, foundation treatment, emergency spillway(s), etc. refer to the standards for PONDS (378) or TR-60.

PLANS AND SPECIFICATIONS

Plans and specifications for installation of floodwater-retarding structures shall be in keeping with this standard and shall describe the requirements for application of the practice to achieve its intended purpose. Construction and material specifications applicable to floodwater-retarding structures will be selected from those listed in Nebraska Construction and Materials Specifications.