

## SOIL CONSERVATION SERVICE

## WEST VIRGINIA

## ENGINEERING STANDARD

## SEDIMENT BASIN (no.)

Definition

A basin constructed to collect and store debris or sediment.

Scope

This standard applies to the installation of all basins where the primary purpose is to trap and store waterborne sediment and debris.

Purpose

To preserve the capacity of reservoirs, ditches, canals, diversions, waterways, and streams; to prevent undesirable deposition on bottom lands and developed areas; to trap sediment originating from construction sites; and to reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural wastes, and other detritus.

Condition Where Practice Applies

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion-control measures to keep soil and other material in place or where a sediment basin offers the most practical solution to the problem. It may be used as a permanent or temporary measure during grading and development of areas.

Federal, State, and Local Laws

All federal, state, and local laws, rules, and regulations governing water use, pollution abatement, health, and safety shall be adhered to. The owner or operator shall be responsible for securing all required permits or approvals and for performing in accordance with such laws and regulations. SCS employees are not to assume responsibility for procuring these permits, rights, or approvals or for enforcing laws and regulations. They may provide the landowner or operator with technical information needed to obtain the required rights, or approvals to construct, operate and maintain the practice.

Permits may be required from the following agencies:

1. U.S. Army Corps of Engineers
2. West Virginia Department of Natural Resources
3. West Virginia Public Lands Corporation

## 350-2 SEDIMENT BASIN

Embankments for nonagricultural use that will be 6 feet or more in height, measured from the stream bottom at the downstream toe and that will or can impound 50 acre-feet or more of water will require that the owner submit an application for a certificate of approval. Embankments that will be 25 feet or more in height and that will or can impound 15 acre-feet or more of water will require that the owner submit an application for a certificate of approval from the state. Farm ponds constructed and used primarily for agricultural purposes including, but not limited to, livestock watering systems, irrigation, retention of animal wastes, or fish culture, and having no potential for loss of human life are exempt from the certificate of approval.

### Design Criteria

#### Embankments

The design of dams, spillways, and drainage facilities shall be according to WV standards for ponds (378) and grade stabilization structures (410) or according to the requirements in TR-60, as appropriate for the class and kind of structure being considered.

Temporary basins having drainage areas of 5 acres or less and a total embankment height of 5 ft. or less may be designed with less conservative criteria if conditions warrant. The embankment shall have a minimum top width of 4 ft. and side slopes of 2:1 or flatter. An outlet shall be provided of earth, pipe, stone, or other devices adequate to keep the sediment in the trap and to handle the 10-year-frequency discharge without failure or significant erosion.

#### Sediment Storage

The capacity of the sediment basin shall equal the volume of sediment expected to be trapped at the site during the planned useful life of the basin or the improvements it is designed to protect. If it is determined that periodic removal of sediment will be practicable, the capacity may be proportionately reduced.

Procedures contained in Erosion and Sediment Control Handbook for Developing Areas West Virginia will be used to determine sediment yield from disturbed areas. When the contributing drainage area consists of 10 ac. or more of undisturbed land, procedures contained in NEH-3, Chapter 8 will be used to determine sediment yield from the undisturbed area. Total sediment volume will be the sum of the yield from both disturbed and undisturbed areas.

#### Detention Storage

In addition to the required sediment storage, the basin shall store the runoff from a 2 yr.-24 hr. storm to the top of the riser or principal outlet. The water stored from this storm will be released by a lower stage, nonclogging, dewatering device. The complete release of the stored water shall be accomplished no sooner than 24 hours after the storm and no later than 8 days after the storm. The elevation of the low stage shall not be lower than the maximum elevation of the design sediment storage volume.

Drain

Provision shall be made to drain the sediment pool to provide for maintenance or insect control.

Safety

Guardrails, fencing and signs should be used to control access to sediment basins. Fencing shall meet the requirements of WV Standards for Livestock Exclusion (472) or Fencing (382).

Vegetation

Vegetation of all disturbed areas shall be accomplished in accordance with the Critical Area Planting Standard (342).

Sediment Removal and Removal of the Basin

Sediment removed during intermediate clean out of the basin will be spread uniformly above the pool area or in other areas where it will not enter the stream. The area will be immediately fertilized, limed, seeded and mulched.

The same procedure will be applicable when the basin has reached its design life and removal is required.

Operation and Maintenance

An operation and maintenance plan shall be developed for the installed basin. The plan shall outline the minimum maintenance necessary to ensure the basin functions for its design life.

Plans will be prepared in conformance with operation and maintenance criteria contained in WV Engineering Standard 378, Pond, or 410, Grade Stabilization Structure for dams or structures falling under the criteria in those standards. Dams built under TR-60 criteria shall have plans prepared in conformance with the National Operation and Maintenance Manual.

Plans and Specifications

Plans and specifications for installation of Sediment Basins shall be in keeping with this standard and shall describe the requirements for application for the practice to achieve its intended purpose.

Specifications for dams to which the criteria in WV Engineering Standards 378 or 410 apply shall be developed in accordance with those standards.

Dams designed under TR-60 criteria shall have specifications developed in accordance with National Engineering Handbook Section 20.

Removal and disposal of sediment and removal of the sediment basin will be addressed in the drawings or specifications.

**Planning considerations for water quantity and quality**

*Quantity*

1. Effects on the water budget, especially volumes and rates of runoff, infiltration, evaporation, deep percolation, and ground water recharge.
2. Effects on downstream flows and aquifers that would affect other water uses and users.
3. Effects on volume of discharge flow on the environmental, social, and economic conditions.
4. Effects on the water table downstream and the results of changes of vegetative growth.

*Quality*

1. Effects on erosion, movement of sediment, pathogens, and soluble and sediment-attached substances.
2. Effects on the visual quality of onsite and downstream water resources.
3. Effects of construction and early establishment of protective vegetation on the surface and ground water.
4. Effects on wetlands and water-related wildlife habitats.