

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

SEDIMENT BASIN

(No.)

CODE 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSE

- Preserve the capacity of reservoirs, wetlands, ditches, canals, diversion, waterways, and streams
- Prevent undesirable deposition on bottom lands and developed areas
- Trap sediment originating from construction sites or other disturbed areas
- Reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural waste solids, and other detritus

CONDITIONS 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.

CRITERIA

General Criteria Applicable to All Purposes

Sediment basin design and construction shall comply with all applicable federal, state and local laws and regulations.

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.

The design of dams, spillways, and drainage facilities shall be according to NRCS Conservation Practice Standard 378 (Pond), Conservation Practice Standard 410 (Grade Stabilization Structure) or according to the requirements in NRCS TR-60 (Earth Dams and Reservoirs), as appropriate for the class and kind of structure being considered.

All disturbed areas shall be treated as soon as possible after construction ends to control erosion and prevent excess sediment from leaving the site.

Provisions shall be made for dewatering sediment pools if necessary for safety and vector control.

Fencing and other safety measures shall be installed as necessary to protect the public.

Due consideration shall be given to good visual resource management.

Criteria Applicable to Temporary Basins

Scope: Any sediment basin designed to (1) function for 36 months or less, (2) have a maximum height of dam less than 15 feet, (3) have a drainage area of 200 acres or less, and (4) *will be removed within 36 months of construction* may be designed in accordance with the following minimum requirements.

These requirements apply to the installation of temporary basins on sites where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of the use or service of public roads or utilities, where the primary purpose is to trap and store

waterborne sediment and debris.

Temporary basins shall be classified according to Table 1:

Table 1. Temporary Basin Classification

| Type | Maximum Drainage Area (acres) | Maximum Height of Dam (feet) |
|------|-------------------------------|------------------------------|
| 1 | 5 | 5 |
| 2 | 50 | 10 |
| 3 | 200 | 15 |

Sediment Storage Capacity: The minimum volume of the sediment basin, measured from the bottom of the basin to the crest of the principal spillway, shall be not less than 0.5 acre-inches for each disturbed acre in the watershed. To maintain efficiency, sediment basins should be cleaned out when one-half of the volume for sediment has been filled up.

Principal or Mechanical Spillway Conduit: When a pipe conduit is used for the principal spillway, the minimum capacity shall be in accordance with Table 2. The principal spillway conduit shall be placed through the dam to extend beyond the downstream toe of the fill. The minimum size shall be 4 inch smooth pipe or 6 inch corrugated metal pipe. A perforated riser (vertical pipe) connected to the barrel at the upstream end shall be designed to provide for draining sediment pools if necessary for safety and vector control after each storm event. The minimum cross-sectional area of the riser shall be one and one-half times that of the conduit.

Table 2. Temporary Basin Design

| Type | Minimum Principal Spillway Capacity | Minimum Emergency Spillway Capacity |
|------|-------------------------------------|-------------------------------------|
| 1 | 0.15 cfs / ac | 10-yr, 24-hr |
| 2 | 0.15 cfs / ac | 25-yr, 24-hr |
| 3 | 0.21 cfs / ac | 25-yr, 24-hr |

The following types of pipe conduits are acceptable: cast iron, steel, corrugated metal, asbestos cement, plastic, reinforced concrete,

and rubber gasket vitrified clay. All pipe joints within the embankment shall be made watertight by use of watertight couplings or gaskets or by welding or caulking.

The pipe shall be capable of withstanding the external loading without yielding, buckling, or cracking.

Perforated Riser: When it is necessary to drain the sediment pool, the riser shall be perforated with 1/4" to 1/2" diameter holes with a minimum spacing of 3" centers in each outside valley. The lower one-third of the perforated riser shall be covered with suitable filter material that will allow complete drainage of pool and adequate filtration during periods of drainage.

The crest elevation of the riser shall be a minimum of 1.0 foot below the crest elevation of the emergency spillway.

Trash Guard: A trash guard shall be installed on the top of the riser to prevent trash or debris from clogging the conduit and provide safety when pond is temporarily full.

Antiseep Collars: Antiseep collars are not required for Type 1 and 2 basins. For Type 3 basins, antiseep collars are to be installed around the pipe conduit within the normal saturation zone when either of the following conditions exist:

1. The conduit is of smooth pipe larger than 8 inches in diameter.
2. The conduit is of corrugated metal pipe larger than 12 inches in diameter.

The antiseep collars and their connections to the pipe shall be watertight. The collar material shall be compatible with pipe materials. The maximum spacing shall be in accordance with Table 3.

Table 3. No. of Antiseep Collars Required

| Fill Height | Collar Projection 1.5 feet | Collar Projection 2.0 feet |
|-------------|----------------------------|----------------------------|
| 0 to 11 | 1 | 1 |
| 12 to 15 | 2 | 1 |

Emergency Spillway: Provisions shall be made for emergency bypassing of the minimum design storm in accordance with

Table 2 to avoid overtopping and possible washout of the embankment.

Embankment Top Width: The minimum top width of the dam shall be:

| <u>Fill Height</u> | <u>Minimum Top Width</u> |
|--------------------|--------------------------|
| 10 feet or less | 8 feet |
| 10 to 15 feet | 10 feet |

Freeboard: The settled top elevation of the dam for Type 1 sediment basins shall be a minimum of 1.0 foot above the natural ground elevation to allow emergency bypassing of flood flows around one or both ends of the dam.

The settled top elevation of the dam for Type 2 and 3 basins shall be a minimum of 1.0 foot above the maximum stage in the emergency spillway during the passage of the design storm.

Side Slopes: The combined upstream and downstream side slopes of the settled embankment shall not be less than 5 horizontal to 1 vertical with neither slope steeper than 2:1.

Settlement: The constructed height of the dam shall be increased by the amount needed to insure that the design top elevation will be maintained after all settlement has taken place but shall not be less than 5 percent.

CONSIDERATIONS

Large sediment basins may have an effect on the peak discharge rate from a watershed. Planners should consider this, and take steps to mitigate any potential negative effects this may have on riparian habitat downstream from the structure.

Visual aesthetics may be a concern, especially in urban or suburban areas. To address these concerns, the basin could be designed to blend with the surrounding topography, or plantings could be proposed to screen the view from surrounding homes or buildings.

The nesting success and survival rate of ground-nesting species will increase if mowing is delayed until after the nesting season during operation and maintenance operations.

Using native species for revegetation will increase habitat diversity.

PLANS AND SPECIFICATIONS

Plans and specifications for installing sediment basins shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Provisions for controlling erosion and reducing sediment loss will be included. Specify rates of seed, mulch, and fertilizer, appropriate planting dates, and method(s) of establishment.

OPERATION AND MAINTENANCE

The sediment basin will be inspected after major storms for damage that may affect its function and performance. Any damage will be promptly repaired.

Mow as need to maintain adequate vegetative cover and to prevent the establishment of undesirable species.