

**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**

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.

Temporary basins having drainage areas of 5 acres or less and a total embankment height of 5 feet or less may be designed according to NRCS [Conservation Practice Standard 638 - Water and Sediment Control Basin](#).

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.

**ADDITIONAL CRITERIA**

Sediment basins can be used to trap solids from concentrated livestock areas prior to entering storage, buffer, or filter systems. Detention storage, in excess of the minimum required, shall be added as needed to reduce basin outflows for the system being designed. The design loadings and quality of materials for wood and concrete walls shall be in accordance with the [Conservation Practice Standard 313 - Waste Storage Facility](#).

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Runoff shall be based on 25-year, 24-hour duration storm rainfall. The recommended runoff curve numbers are 90 for unpaved lots and 95 for paved lots. The minimum runoff curve number for unpaved lots shall be 85.

Flood routing of the sediment basin shall utilize procedures contained in TR-55, Chapter 6, NRCS national Engineering Handbook (NEH), Part 650, Engineering Field Manual, Chapter 11.

The sediment basin shall have sufficient capacity to store or safely route a 25-year, 24-hour storm.

The bottom elevation of the settling basin shall be at least 2 feet above bedrock or groundwater.

Temporary Sediment Barriers are used to trap sediment from construction or other disturbed areas where the barriers are needed for less than 2 years and the drainage are less than 2 areas. Temporary sediment barriers include synthetic fabric silt fences, straw bale barriers, coarse aggregate barriers, and other appropriate materials.

A temporary sediment barrier may be used where the minimum barrier height is less than 5 feet, and where failure of the barrier would not cause loss of life or damage to high-value property or significant damage to lower-value property. The barrier shall be adequate to retain the sediment and handle the 10-year, 24-hour storm frequency discharge without failure or significant erosion for the anticipated life of the barrier.

### **Straw Bale Sediment Traps**

Straw bale sediment traps should only be used in situation where a life span of less than 3 months is required.

Straw bale sediment traps shall be installed on the contour, except that the ends shall be turned uphill 1-2 feet in elevation to prevent water from bypassing the ends.

The maximum length of uncontrolled slope upstream from a straw bale sediment trap shall not exceed 150 feet.

The straw bales must be entrenched at least 4 inches into the ground and anchored with two stakes driven through the bale and at least 8 inches into the ground. The stakes shall be 2"

X 2" (nominal) wooden stakes or standard steel posts or equivalent.

Soil shall be compacted against the upstream base of the bales to prevent undermining by runoff. Gaps between bales must be filled by wedging them full of loose straw.

Straw bale sediment traps shall not be used in channels or other areas of concentrated flow.

### **Silt Fences**

Where a geotextile fabric is used to trap sediment from disturbed areas, it shall be installed on the contour, except that the ends shall be turned uphill 1-2 feet in elevation to prevent water from bypassing the structure.

The maximum length of uncontrolled slope upstream from the silt fence shall not exceed 150 feet.

The geotextile fabric silt fence shall not be used in channels or others of concentrated flow.

The geotextile shall consist of either woven or nonwoven fabric with the following requirements:

- Woven fabric shall have the minimum strength values in the weakest principal direction.
- Nonwoven fabric may be needle punched, heat bonded, resin bonded or a combination thereof.
- Material properties in accordance with ASTM D 1682, ASTM D 3786, Corp of Engineers, CW-02215-77, ASTM D 4491 and ASTM D 4355.

Geotextile fabric with support netting shall be reinforced with an industrial polypropylene netting with a maximum mesh spacing of three-quarter (3/4) inches or equal. A heavy-duty nylon top support cord or equivalent shall be required. Posts shall be installed at a spacing of 8 feet or less.

A wire support fence may be attached to the geotextile fabric to increase the spacing between posts. The wire support fence shall be a minimum of 14 ½ gage woven wire with a maximum mesh spacing of 6 inches.

The top of the geotextile fabric shall be secured to the top of the fence with staples or wire rings spaced at 12 inches center to center. The geotextile fabric shall be folded a minimum of 3 inches over the top of the wire fence. Posts shall be installed at a spacing of 10 feet or less.

Posts shall be either wooden or steel with a minimum length of 4 feet. Wooden posts shall be a minimum dimension of 2"x2" (nominal). Steel posts shall be studded "Tee" or "U" types with a minimum weight of 1.3 pounds per lineal foot. Anchors sufficient to resist post

deep by 4 inches wide on the upslope side of the posts. The fabric shall be folded to fit the trench and backfilled and compacted to existing ground line.

Geotextile fabric attached directly to wooden posts shall be secured with wire staples or with wooden lath and nails.

#### Storm Drain Inlet Protection

For temporary barriers that are installed around storm drain inlets, perimeter length of the barrier must be at least 4 times the perimeter of the storm drain inlet. Where storm flows could overtop the barrier, the top of the barrier needs to be level throughout the perimeter length.

Barriers shall be located where a traffic hazard will not be created and where traffic and

**Table 1**

**Minimum Silt Fence Fabric Properties**

Test	Method	Minimum Requirements <sup>1</sup>
Grab Tensile strength (pounds)	ASTM D 1682	100
Mullen Burst strength (pounds/square inch)	ASTM D 3786	200
Apparent opening size	Corp of Engineers CW-02215-77	50-80 fine soils <sup>2</sup> 30-60 coarse soils <sup>3</sup>
Water flow rate (gal/min/sq feet at 50 mm constant head)	ASTM 4491 <sup>4</sup>	10
Ultraviolet radiation	ASTM D 4355	90

<sup>1</sup>All numerical values represent minimum average roll values (i.e., the average of test results on any roll in a lot should meet or exceed the minimum values in the table.

<sup>2</sup> Fine soli refers to soils with more than 50 percent by weight passing the No. 200 sieve.

<sup>3</sup> Coarse soil refers to soils with less than 50 percent by weight passing the No. 200 sieve.

<sup>4</sup>Water flow rate can be determined by multiplying permittivity as determined by ASTM D 4491 in l/second by conversion factor of 74. movement are required. All posts shall be driven at least 2 feet into the ground.

The bottom edge of the silt fence fabric must be anchored by burying in a trench 6 inches

construction activities will not destroy or cause constant need for maintenance of the barriers. Barriers shall be located so that any resulting ponding of storm water will not cause

excessive inconvenience or damage to adjacent areas or structures.

### **Seeding**

All embankments and other disturbed areas shall be vegetated in accordance with [Conservation Standard 342 - Critical Area Planting](#).

## **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 needed to maintain adequate vegetative cover and to prevent the establishment of undesirable species.

## **REFERENCES**

USDA, NRCS, Arkansas Field Office Technical Guide, Section IV, Conservation Practice Standards and Specifications.

[USDA, NRCS, National Engineering Handbook, Part 650, Engineering Field Handbook.](#)

[USDA, NRCS, National Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook.](#)

USDA, NRCS, Technical Release 55, Urban hydrology for small Watersheds.