

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WATER AND SEDIMENT CONTROL BASIN

(No.)

CODE 638

DEFINITION

An earth embankment or a combination ridge and channel generally constructed across the slope and minor water courses to form a sediment trap and a water detention basin.

PURPOSE

To improve the ability to farm sloping land, reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff and improve downstream water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where:

1. The topography is generally irregular.
2. Watercourse gully erosion is a problem.
3. Sheet and rill erosion is controlled by other conservation practices.
4. Runoff and sediment damage land and improvements.
5. Soil and site conditions are suitable.
6. Adequate outlets are available or can be provided.

This practice is not applicable where construction would destroy important woody wildlife cover or the present watercourse is not seriously eroding.

Water and sediment control basins shall not be used in place of terraces. When a ridge and channel extends beyond the detention basin or level embankment, the system shall be designed as a terrace.

CRITERIA

General Criteria Applicable to All Purposes

The installation and operation of water and sediment control basins shall comply with all Federal, State and local laws, rules and regulations.

**Section IV, FOTG
Standard 638**

Spacing

Water and sediment control basins shall generally be spaced at terrace intervals. The grade of the watercourse between basins shall be considered and the spacing set to prevent watercourse or gully erosion.

Water and sediment control basins can be used as a part of a terrace system to control small watersheds. They are intended to be utilized in the watershed and not at the outlet of a watercourse. Reference Standard 410, Grade Stabilization Structures or Standard 350, Sediment Basins for this purpose. The uncontrolled drainage area to each basin should not exceed 30 acres.

Cross Section

Embankments may consist of a broadbase (both slopes are farmable), narrow base (both slopes are vegetated) or steep backslope (front slopes are farmable backslopes are vegetated) configuration. Embankment slopes shall not be steeper than 2:1. Farmable slopes shall not be steeper than 5:1. The combined side slopes shall not be less than 5:1. The minimum effective top width of the dam is shown in the table below.

<u>Fill Height (ft)</u>	<u>Effective Top Width (ft)</u>
0-5	3
5.1-10	6
10.1-15	8

The constructed height of the embankment shall be at least 5 percent greater than the designed height to allow for settlement. The maximum settled height shall be 15 feet, measured from the natural ground at the centerline of the embankment to the top of the dam.

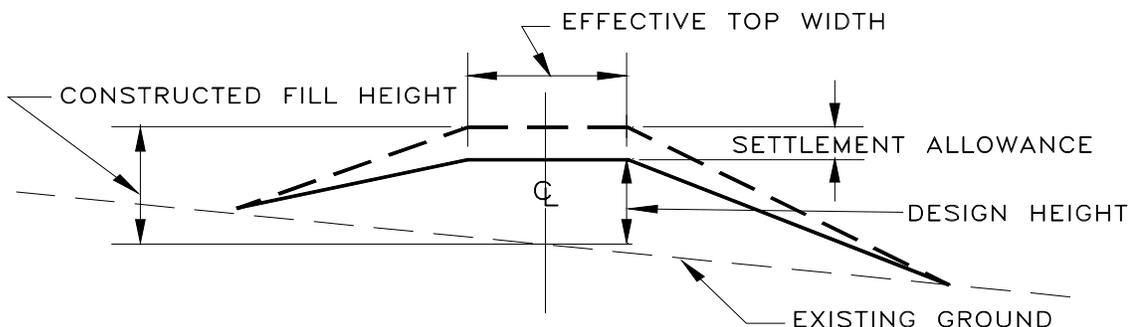


Figure 1. Typical Cross - Section

Capacity

The capacity of the basin shall be large enough to control the runoff from a 10-year, 24-hour frequency storm without overtopping. The capacity of basins designed to provide flood protection or to function with other structures may be larger and shall be adequate to control a storm of a frequency consistent with the potential hazard.

The basin capacity shall be increased to provide storage for the anticipated 10-year sediment accumulation, unless provisions are made for periodic sediment removal from the basin to maintain the design capacity and the landowner agrees to this provision in the operation and maintenance plan.

The drainage of each basin shall be limited so that the duration of flooding, infiltration, or seepage does not damage crops or create other problems. The maximum drawdown time for cropland shall be 24 hours and 48 hours for pastureland. Runoff shall not be ponded on a neighboring property without proper legal documentation.

End enclosures may be necessary to obtain the design capacity. A maximum 0.5-ft of freeboard may be added to the design height to provide for an emergency spillway around one or both ends of the basin. The emergency spillway should not outlet to a lower basin in series that does not have an emergency spillway.

Outlets

Water and sediment control basins shall have underground outlets that meet the requirements for Standard 620, Underground Outlets.

Topsoil

Where necessary to restore or maintain productivity, topsoil must be stockpiled and spread over disturbed areas.

Vegetation

Slopes and disturbed areas that are not to be farmed shall be established to suitable erosion resistant vegetation. Environmental quality and wildlife food and habitats shall be considered in selecting the species of vegetation. Seedbed preparation plus seeding, fertilizing and mulching rates shall comply with Standard 342, Critical Area Planting.

Considerations

Water and sediment control basins should be part of a resource management plan including such practices as terraces, grassed waterways, contouring, a conservation cropping system, conservation tillage, and crop residue management.

Where possible, the basin should be configured to enhance sediment deposition. This can be accomplished by using flow deflectors, inlet and outlet selection, and by adjusting the length to width ratio.

Section IV, FOTG Standard 638

For cropped fields, embankment orientation and crop row direction should be approximately perpendicular to the land slope to support contour farming. The design should support farmability by limiting short point rows or sharp curves. Field boundaries and row lengths should also be considered in planning basin location and row direction.

This practice can be used to develop/enhance seasonally ponded areas for migratory waterfowl.

Where possible, the design should enhance habitat for native and endangered species.

Effects on downstream water quality and temperature may be critical for some species.

This practice may adversely affect cultural resources. Planning, installation, and maintenance must comply with GM 420, Part 401.

Operation safety of vehicle and farming equipment should be considered when selecting cut and fill slopes, especially where cropping or haying is planned.

Plans and Specifications

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

Operation and Maintenance

A maintenance plan shall be provided for each planned conservation system and practice. The maintenance plans for the water and sediment control basin shall include maintenance requirements for the embankment, design capacity, vegetative cover, and the outlet. Maintenance should include provisions for inspection of inlets, outlets and embankments after each storm event. Any damage to the basin should be corrected as soon as possible to prevent major damages.

The sediment and design capacity shall be maintained at intervals specified in the O&M plan by cleaning the basin or, where practical, by raising the embankment height. Excavated material spread on the cropland shall be placed to enhance topography and maintain fertility. Fill material, for increasing the embankment height, shall be obtained in a manner that enhances topography and maintains productivity of the cropland. The vegetation shall be maintained to prevent sheet and rill erosion or gulying of the embankment. Trees and woody cover generally create problems on embankments and should be controlled.

**NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION**

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Earth Embankment

Water and sediment control basins shall be constructed as designed, staked and/or flagged in the field. Fill material shall be free of sod, roots, organics, and stones larger than six (6) inches (0.15 m) or other objectionable material. Fill shall be placed in approximately horizontal lifts no greater than 6 inches prior to compaction. Each lift shall be compacted using excavating equipment or equivalent. At least two (2) passes of compaction equipment, covering each lift, shall be required. Fill material shall have a moisture content that will allow a ball of soil to hold together when squeezed by hand. The fill material shall not be frozen or placed on a frozen foundation.

Borrow Area

If cuts expose unfavorable subsoil in the borrow, the topsoil shall be stockpiled and replaced. Cuts and fills should be made in a manner that enhances the topography. Excessive cuts, to secure borrow to build the basin ridge through depressions, should be avoided. Borrow, when taken from adjacent ridges, should level the field and improve farmability.

Underground Outlets

If underground outlets are located under embankments, provisions shall be made to prevent piping, which may include hand tamping or installing the outlet during the previous construction season to allow for settlement. The materials used for the inlet and underground outlet shall be as specified in the design. Backfill material within 6 inches of the pipe shall be free of clods and stones greater than 3 inches to avoid crushing.

General

Construction operations shall ensure that erosion, air, and water pollution is minimized. Any changes in the plans or specification shall be approved by the local NRCS office. The landowner or his/her designated representative is responsible for obtaining approval for any changes.