

**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.

**SCOPE**

This standard covers the planning, design and construction of water and sediment control basins. It does not apply to DIVERSIONS (362), GRADE STABILIZATION STRUCTURES (410), SEDIMENT BASINS (350) or TERRACES (600).

**PURPOSE**

Water and sediment control basins are constructed to reduce on-site erosion, reduce sediment content in water, intercept and conduct surface runoff through subsurface conduits to stable outlets, reduce peak rate or volume of flow at downslope locations, reduce flooding, prevent gully development, reform the land surface, and improve farmability.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice is applicable to sites where:

- The topography is such that terraces cannot be installed and farmed with reasonable effort.
- Runoff and sediment from higher-lying areas will damage land or improvements downstream.
- Watercourse, gully and ephemeral erosion are a problem, and grassed waterways cannot be constructed and maintained.

- Sheet and rill erosion are controlled by other conservation practices.
- Soils are suitable for practical and economical construction and maintenance.
- Suitable outlets can be provided.
- The basins are a part of a resource management system.

**DESIGN CRITERIA**

**General**

Systems of water and sediment control basins shall generally be used on cropland fields where the topography is such that terrace systems cannot be constructed and farmed with reasonable effort. In no case shall systems of water and sediment control basins be used in place of terrace systems.

**Water and Sediment Control Basins as Part of Management Systems**

All water and sediment control basins will be constructed as part of a resource management system for cropland.

Where gradient terraces would be applicable, a system of water and sediment control basins, when combined with planned cultural and management practices, will be adequate to reduce soil loss in the area above and between basins to the permissible limits.

Usually, some of the area draining to an individual basin will not be farmed on the contour, and the direction of erosive slope will seldom be perpendicular to the basin ridge. Good residue management systems and crop rotations are to be used in conjunction with this practice.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service.

**NE-T.G. Notice xxx  
Section IV  
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## WATER AND SEDIMENT CONTROL BASIN (638)-2 Statewide

Where level terraces would be applicable, systems of water and sediment control basins, when combined with planned cultural and management practices, will be adequate to prevent soil eroded from the area above or between basins from leaving the field, without requiring excessive maintenance of the basins. Good residue management systems and crop rotations are to be used in conjunction with this practice.

In each case, the plan for the system will document the additional components of the resource management system needed to meet the conservation objectives.

### Spacings

Spacing of water and sediment control basins will depend on the predominant land slope, cross-sections, tillage and management system used, and type of terrace that normally would be used on the site. The spacing of water and sediment control basins will comply with those tabulated in the Standard for TERRACES (600).

Where land ownership or physical conditions preclude treatment of the upper portion of a slope, a water and sediment control basin may be used to separate this area from, and permit treatment to, the lower part of the slope. The uncontrolled drainage area above the basins used for this purpose shall not exceed 30 acres.

A water and sediment control basin also may be used in series with, and downstream from, the lowest terrace in a series at locations, such as field boundaries and fence lines. The spacing below the lowest terrace shall not exceed 1.5 times the applicable terrace spacing.

### Alignment

The ridge or embankment of each basin shall be nearly perpendicular to the principal land slope, permitting rows to be farmed as closely as possible to the contour. Systems of water and sediment control basins should be made parallel where feasible.

### Cross-section

For uncontrolled drainage areas not exceeding 5 acres, the cross-sections used shall be those

specified for TERRACE (600) and may be either broad-based or grassed backslope, as applicable.

For uncontrolled drainage areas exceeding 5 acres, the effective top width shall be as follows:

Fill Height	Effective Top Width
0 - 5'	3'
5 - 10'	6'
10 - 15'	8'

The maximum fill height for water and sediment control basins shall be 15 feet, measured from natural ground at centerline of ridge. The constructed height of the embankment shall be at least 5% greater than the design height to provide for settlement. Combined side slopes shall not be less than 5:1.

### Capacity

Water and sediment control basins shall be constructed to store, as a minimum, the runoff from a 10-year frequency, 24-hour-duration storm from the contributing drainage area. In addition, capacity shall be provided to store at a minimum the anticipated 5-year sediment accumulation and provisions made to maintain the design capacity through maintenance.

### Nonstorage Sections

Water and sediment control basins may be extended as short nonstorage sections, consisting of a ridge and/or channel. The velocity in the channel shall not exceed that which is nonerosive for the soil and planned treatment when subjected to the runoff from a 10-year frequency, 24-hour-duration rainfall.

### End Closures

All water and sediment control basins shall have ends closed to the elevation needed for the design capacity. A maximum of 1 foot of freeboard may be added to the design height to provide for an emergency spillway around one or both ends of the basin. When such an emergency spillway is used, it shall not contribute runoff to a lower basin in series not similarly provided with an emergency spillway.

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### **Outlets**

All water and sediment control basins shall have underground outlets or will have soil infiltration meeting the requirements of those shown in TERRACE (600) and UNDERGROUND OUTLET (620). The soil interpretations data in Section II of the Technical Guide may be used to evaluate the permeability of the soils.

Underground conduits shall have the capacity to discharge the design storm in not less than 6 hours nor more than 72 hours following the storm period. Shorter periods may be necessary for some crops, depending on soil characteristics and the water tolerance of the crops to be grown.

Basins should be cleaned out or the ridge raised to restore capacity when the storage provided for sediment has been used. Borrow for additional fill material should be made in a manner that will enhance the topography and farmability of the area.

### **CONSTRUCTION SPECIFICATIONS**

Water and sediment control basins shall be constructed to the line, grade, and dimensions as staked in the field.

Cuts and fills along the line of the basin may be necessary to improve alignment and to make the system parallel. Where deep cuts will expose unfavorable subsoil, the topsoil should be stripped, stockpiled, and replaced.

Cuts and fills should be made in such a manner that topography will be enhanced. Excessive cuts should not be made in depressions to secure borrow to build the basin ridge through these areas, since this accentuates the undulations of the field. Borrow for large fills across depressions should be taken from the intervening ridges, preferably immediately below the basin ridge, which will tend to smooth out the area to be farmed.

Construction operations shall be carried out in such a manner that erosion and air and water pollutions will be minimized.

### **Vegetating Slopes**

Seed immediately after construction, if possible. Seeding and Fertilizing will be according to CRITICAL AREA PLANTING (342).

### **MAINTENANCE**

All water and sediment control basins should be checked after each large storm and needed maintenance performed.