

**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 watercourses to form a sediment trap and water detention basin.

**PURPOSES**

A water and sediment control basin may be established to:

- Improve farmability of sloping land
- Reduce watercourse and gully erosion
- Trap sediment
- Reduce and manage onsite and downstream runoff
- Improve downstream water quality

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to sites where:

- The topography is generally irregular,
- Watercourse or gully erosion is a problem,
- Sheet and rill erosion is controlled by other conservation practices,
- Runoff and sediment damage land and improvements,
- Soil and site conditions are suitable, and
- Adequate outlets can be provided.

It does not apply to Practice Standards 362, Diversions; 410, Grade stabilization Structures; or 350, Sediment Basins; or 600, Terrace.

**CRITERIA**

Water and sediment control basins shall not be used in place of terraces. Where a ridge and/or channel extend beyond the detention basin or level embankment, Practice Standard 600, Terrace, or 362, Diversion, may be used.

The resource management system must reduce soil loss in the interval above and below the basin to prevent excessive maintenance and operation problems.

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 of the lower slope.

The design must limit inundation, infiltration, and seepage.

**Safety.** Operational safety of vehicle and farming equipment must be considered when selecting cut and fill slopes, especially where cropping or haying is planned.

**Laws and Regulations.** This practice must conform to all federal, state, and local laws and regulations. Laws and regulations of particular concern include those involving water rights, dam construction, land use, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.

Effects on streams and wetlands must be considered and mitigation may be required.

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

**Capacity.** Basins must have capacity to prevent overtopping by runoff from a 10-year frequency, 24-hour duration storm. Larger design storms may be used for flood control or other purposes.

Additionally, basins must have capacity to store at least a planned 10-year sediment accumulation, or periodic sediment removal must be provided to maintain the required capacity.

Basin ends must be closed to an elevation that will contain design capacity. Freeboard must be added to design height to provide for safe operation of auxiliary spillways. Auxiliary spillways must not contribute runoff to a lower structure except where the lower structure is designed to control the flow.

**Outlets.** Water and sediment control basins must have spillways, underground outlets or soil infiltration outlets that conform to Standard 378, Pond; 412, Grassed Waterway; 362, Diversion; or 620,

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Underground Outlet; as appropriate.

**Spacing.** Water and sediment control basins must be spaced at terrace intervals as per Practice Standard 600, Terrace. Adjust spacing or include other measures needed to prevent erosion in the watercourse between basins.

The system of basins and row arrangements must be parallel and spaced to accommodate farm machinery, where needed, to fit row crop spacing.

Spacing design must consider embankment slope lengths, top width, and outlet location.

**Cross-section.** For portions of the basin controlling only flowing water 3 feet or less deep, embankment slopes must be two horizontal to one vertical, or flatter. For all other portions of the basin, the sum of the upstream and downstream slopes must be 5:1 or flatter with a maximum of 2:1 in either slope. Slopes may be vegetated or flattened to permit cropping.

**Earth Embankment.** Minimum effective top widths are given in **Table 1**. Constructed embankment height must be at least 5% greater than design height to allow for settlement. The maximum settled height of the embankment must be 15 feet or less measured from natural ground at centerline of the embankment.

**Table 1**  
**Minimum Top Width of Embankments**

Fill Height (feet)	Effective Top Width (feet)
0 – 5	4
5 - 10	6
10 –15	8

**Foundation cutoff and seepage control.** Portions of basin ridges designed to impound more than a 3-foot depth of water must include foundation cutoff and seepage control as required by Standard 378, Pond.

**Topsoil.** Where necessary to restore or maintain productivity, sufficient topsoil must be stockpiled and subsequently spread over disturbed areas to a depth of at least 6 inches.

**Vegetation.** Disturbed areas that are not cropped must be established to appropriate vegetation or otherwise protected from erosion using organic or gravel mulch or other measures.

Selection of vegetation species must consider environmental quantity and quality, endangered species needs, and wildlife habitat needs. Seedbed preparation,

fertilizing, seeding, and mulching must be in accordance with Standards 342, Critical Area Planting; and 484, Mulching.

### CONSIDERATIONS

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

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

Effects on downstream water quality and temperature may be critical for some species. This practice can be used to develop/enhance seasonally ponded areas for migratory waterfowl and habitat for native and endangered species.

### PLANS AND SPECIFICATIONS

Plans and specifications for installing sediment and water control basins must conform to requirements of this standard and must describe requirements for applying the practice and achieving its intended purpose.

### OPERATION AND MAINTENANCE

A site specific O&M plan must be prepared for and reviewed with the landowner or operator. The plan shall contain guidance to maintain the embankment, design capacity, vegetative cover and outlet.

All plans shall include a provision that after each large storm, basins must be inspected and needed maintenance performed.

Where designs include underground outlets, O&M plans should include checking for clogging and/or pipe damage.