

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

**WATER AND SEDIMENT CONTROL BASIN**

(No.)  
Code 638



- Runoff and sediment damages land and works of improvement.
- Adequate outlets can be provided.

Do not use this standard in place of terraces. Where a ridge and/or channel extend beyond the detention basin or level embankment, use Florida NRCS conservation practice standards Terrace, Code 600 or Diversion, Code 362 as appropriate.

**DEFINITION**

An earth embankment or a combination ridge and channel generally constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable outlet.

**PURPOSES**

This practice may be applied for one or more of the following purposes:

- to reduce watercourse and gully erosion
- to trap sediment
- to reduce and manage onsite and downstream runoff.

**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.

**CRITERIA**

**General Criteria Applicable To All Purposes**

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

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, and property easements.

Install Water and Sediment Control Basins as part of a conservation system that adequately addresses resource concerns both above and below the basin. Where land ownership or physical conditions preclude treatment of the upper portion of a slope, a Water and Sediment

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

Control Basin may be used to separate this area from and permit treatment of the lower slope.

**Location.** Locate Water and Sediment Control Basins to control erosion in drainage ways. Basins may be installed singly or in series as part of a system. Adjust the location to fit the topography, maximize storage and accommodate farm equipment and farming operations.

**Earth embankment.** Minimum top widths are shown in Table 1. Construct embankments at least 5% greater than design height to allow for settlement. Measured from natural ground at the centerline of the embankment, the maximum settled height of the embankment must be 15 feet or less.

Table 1 - Minimum Top Width of Embankments

Fill Height (feet)	Top Width (feet)
0 - < 5	3
5 - <10	6
10 - 15	8

Design embankment slopes no steeper than two horizontal to one vertical (2:1). The sum of the horizontal components of the upstream and downstream slopes of the embankment must be five (5) or greater. Design all slopes to be farmed no steeper than those on which farm equipment can be operated safely.

**Foundation cutoff and seepage control.** Portions of basin ridges designed to impound more than a depth of three (3) feet of water must include foundation cutoff and if conditions warrant, seepage control. Refer to Florida NRCS conservation practice standard Pond, Code 378 for criteria for foundation cutoff and seepage control measures.

**Capacity.** As a minimum, design Water and Sediment Control Basins with sufficient capacity to control the runoff from a 10-year frequency, 24-hour duration storm using a combination of flood storage and discharge through the outlet. Where basins are used for flood control or to protect other works of improvement, if warranted, use larger design storms appropriate to the risk.

In addition to the above storage, Water and Sediment Control Basins must have the capacity to store at least the anticipated 10-year sediment accumulation, or periodic sediment removal is

required in the Operation and Maintenance Plan to maintain the required capacity.

**Outlets.** A Water and Sediment control basin must have an adequate outlet. The outlet must convey runoff water to a point where it will not cause damage. Outlets can be underground outlets, pipe drop structures, soil infiltration, stabilized channels or a combination of outlet types.

If the basin is cropped, design the outlet so that the flow release time does not exceed the inundation tolerance of the planned crops. If sediment retention is a primary design goal, adjust the release rate according to sediment particle size so that sediment is retained in the basin. Refer to Florida conservation practice standard, Underground Outlet, Code 620 for design criteria for underground outlets.

Outlets can include auxiliary spillways above the primary storage to handle large storm flows. If an auxiliary spillway is used, add freeboard to the design height of the embankment to provide for the safe operation of the spillway. The freeboard shall be at least 0.5 foot above the design flow depth through the auxiliary spillway. Auxiliary spillways must not contribute runoff to lower Water and Sediment Control Basins unless they are designed to handle the runoff. Refer to Florida NRCS conservation practice standard Pond, Code 378 for criteria to design auxiliary spillways.

**Topsoil.** Where necessary to restore or maintain productivity, spread topsoil over areas disturbed by construction. Topsoil can be salvaged and stockpiled from the site of the Water and Sediment Control Basin prior to construction.

**Vegetation.** After construction of the Water and Sediment Control Basin, vegetate disturbed areas that will not be cropped as soon as possible. In non-cropland settings other erosion protection, such as gravel or organic mulches, can also be used. Refer to Florida NRCS conservation practice standard Mulching, Code 484 for criteria on mulching.

Refer to Florida conservation practice standard Critical Area Planting, Code 342 for criteria on seed selection, seedbed preparation, fertilizing, liming, seeding, and mulching.

## CONSIDERATIONS

Water and Sediment Control Basins can be spaced at intervals down a slope, similar to terraces, in order to control erosion. Refer to Florida NRCS conservation practice standard Terraces, Code 600 for methods to determine spacing. Additional conservation measures may be needed in the water course between basins to prevent erosion.

When choosing the location of a Water and Sediment Control Basin be sure to consider the extent of ponding that will occur from the basin. If the basin will cause water to pond near or across property lines both land owners should agree in writing on the elevation and expected duration of ponding.

The soil survey can be a valuable resource when planning and designing water and sediment control basins. The soil survey can identify potential problems such as the presence of limiting layers to plant growth in the soil profile. Field investigations can then identify problem areas to avoid such as shallow bedrock or dense, acid or saline layers that will adversely affect plant growth if construction brings them into the root zone.

Sediment retention within the basin can be enhanced by using flow deflectors, inlet and outlet selection, and by increasing the length to width ratio of the basin.

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.

Underground outlets from Water and Sediment Control Basins can provide a direct conduit to receiving waters for contaminated runoff from crop land. To reduce the impact of this runoff, Water and Sediment Control Basins should be installed as part of a conservation system that includes such practices as grassed waterways, contouring, a conservation cropping system, conservation tillage, nutrient and pest management, crop residue management and filter areas to reduce or mitigate contaminated runoff.

Seasonal water sources can be very important for migratory waterfowl and other wildlife. Partially blocking the outlet of a basin during

non-cropping times of the year will allow water to pond in the basin to provide water for wildlife.

The construction of Water and Sediment Control Basins can introduce steep and potentially dangerous slopes into crop fields. When designing Water and Sediment Control Basins that will be farmed, choose flat slopes that will be safe for operating farm equipment. Where steep slopes are unavoidable, make sure that the farmer is aware of the location of the basin and the potential danger.

## PLANS AND SPECIFICATIONS

Plans and specifications for Water and Sediment Control Basins must describe the requirements for applying the practice according to this standard. As a minimum the plans and specifications shall include:

- A plan view of the layout of the Water and Sediment Control Basin system.
- Typical cross sections of the basin(s).
- Profile(s) of the basin(s).
- Details of the outlet system.
- For underground outlets, details of the inlet and profile(s) of the underground outlet.
- Seeding requirements, if needed.
- Earthfill and compaction requirements.

## OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan and review with the landowner/operator. The minimum requirements to be addressed in the operation and maintenance plan are:

- Periodic inspections, especially immediately following significant runoff events.
- Prompt repair or replacement of damaged components.
- Maintenance of basin ridge height and outlet elevations.
- Removal of sediment that has accumulated in the basin to maintain capacity and grade.
- Regular cleaning of inlets for underground outlets. Repair or replacement of inlets damaged by farm equipment. Removal of sediment around inlets to ensure that the inlet remains the lowest spot in the basin.

- Where vegetation is specified, regular mowing and control of trees and brush. Vegetative disturbance should be scheduled to avoid the peak nesting season.
- Notification of hazards about steep slopes on the basin

#### REFERENCES

Florida NRCS Conservation Practice Standards,  
Critical Area Planting, Code 342  
Diversion, Code 362  
Grassed Waterway, Code 412  
Mulching, Code 484  
Pond, Code 378  
Terrace, Code 600  
Underground Outlet, Code 620  
General Manual  
Title 420-Part 401  
Title 450-Part 401  
Title 190-Parts 410.22 and 410.26  
National Cultural Resources Handbook  
National Engineering Field Handbook, Part 650,  
Chapter 5  
National Environmental Compliance Handbook  
National Food Security Act Manual  
National Planning Procedures Handbook, Florida  
Supplements to Parts 600.1 and 600.6