

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

- 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:

1. The topography is generally irregular.
2. Watercourse or 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 can be provided.

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, Florida NRCS conservation practice standards Terrace, Code 600 or Diversion, Code 362 must be applied as appropriate.

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).

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

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

be used to separate this area from, and permit treatment of the lower slope.

The design must limit inundation, infiltration, and seepage to prevent crop damage and/or other problems.

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, and property easements.

Spacing. Water and sediment control basins must generally be spaced at terrace intervals (see Florida NRCS conservation practice standard Terrace, Code 600). 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.

Embankment cross section. For portions of the basin controlling only flowing water 3.0 feet in depth or less, embankment slopes must be two horizontal to one vertical (2:1), or flatter. For all other portions of the basin, the sum of the upstream and downstream slopes must be five horizontal to one vertical (5:1) or flatter with a maximum of two horizontal to one vertical (2:1) in either slope. Slopes may be vegetated or flattened to permit cropping.

The maximum design height must be 15 feet or less measured from natural ground at centerline to the top of the embankment. Constructed embankment height must be at least 5% greater than design height to allow for settlement. Additional design settlement may need to be added based on type of construction methods used to construct the embankment.

Embankment top width. Minimum effective top widths are given in Table 1.

Table 1 - Minimum Top Width of Embankments

| Fill Height (feet) | Effective Top Width (feet) |
|--------------------|----------------------------|
| 0 – 5 | 3 |
| 5 - 10 | 6 |
| 10 –15 | 8 |

Foundation cutoff and seepage control. Portions of basin ridges designed to impound more than a depth of 3.0 feet of water must include foundation cutoff and seepage control as required by Florida NRCS conservation practice standard Pond, Code 378.

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 where needed for flood control or other purposes.

In addition to the above storage, basins must have capacity to store at least the anticipated 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 may be added to design height to provide for safe operation of auxiliary spillways. Auxiliary spillways must not contribute runoff to a lower basin (or pond) except where the lower basin (or pond) is designed to control the flow.

Outlets. Water and sediment control basins must have spillways, underground outlets or soil infiltration outlets that conform to Florida NRCS conservation practice standards Pond, Code 378; Grassed Waterway, Code 412; Diversion, Code 362; or Underground Outlet, Code 620 as appropriate.

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

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 food and habitat needs. Seedbed preparation, fertilizing, seeding, and mulching must be in accordance with Florida NRCS conservation practice standards for Critical Area Planting, Code 342 and Mulching, Code 484.

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.

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 streams and wetlands must be considered. Mitigation may be required where water is diverted or degraded for downstream uses.

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.

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 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.

As a minimum, the plans and specifications shall include:

- Location of structure.
- Typical profile and cross-section of embankment and principal spillway.
- Type, quality, and quantity of materials used for structures.
- Compaction requirements.
- Vegetative requirements.

OPERATION AND MAINTENANCE

A site specific operation and maintenance (O&M) plan must be prepared for and reviewed with the landowner or operator. The O&M 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. When sediment storage is full, accumulated sediment must be removed or the basin must be redesigned and modified to restore capacity.

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

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