

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 peak rate of flow at downstream locations
- Improve downstream water quality

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where:

- The topography is generally irregular and precludes installing and farming terraces with reasonable effort.
- Watercourse or gully erosion is a problem.
- Sheet and rill erosion is controlled by other conservation practices.

The landowner shall obtain all necessary permissions from regulatory agencies, including the Illinois Department of Agriculture, US Army Corps of Engineers, US Environmental Protection Agency, Illinois Environmental Protection Agency and Illinois Department of Natural Resources – Office of Water Resources, or document that no permits are required.

Laws and Regulations. This practice must conform to all federal, state, and local laws and

- Runoff and sediment damage land and improvements.
- Soil and site conditions are suitable.
- 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, standards for Terrace (600) or Diversion (362) must be applied as appropriate.

CRITERIA

General Criteria Applicable To All Purposes

Practices applied as part of the resource management system must reduce soil loss in the interval above and below the basin to acceptable levels.

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 to prevent crop damage and/or other problems.

Utilities and Permits. The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

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.

Interval. Water and sediment control basins must generally be spaced at terrace intervals (see Conservation Practice Standard 600, Terrace). Adjust interval 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.

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

Cross section. Design embankment slopes no steeper than 2 horizontal:1 vertical, or flatter. The sum of the upstream and downstream slopes must be 5 or greater. Slopes may be flattened to permit cropping, or vegetated.

Earth Embankment. Minimum 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)	Top Width (feet)
0 – 5	3
5 - 10	6
10 –15	8

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 the 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 underground outlets or soil infiltration outlets that conform to Conservation Practice Standard 620, Underground Outlet.

Topsoil. Where necessary to restore or maintain productivity, topsoil shall 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.

Seedbed preparation, fertilizing, seeding, and mulching must be performed in accordance with Conservation Practice 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, 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.

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

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

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

Prepare plans and specifications for Water and Sediment Control Basins (WASCOBs) that 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 WASCOB system.
- Typical cross sections of the WASCOB(s).
- Profile(s) of the WASCOB(s).
- Details of the outlet system.
- For underground outlets, details of the inlet and profile(s) of the underground outlet.
- Seeding requirements, if needed.
- Construction specifications that describe in writing site-specific installation requirements of the WASCOB system.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for the 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 WASCOB ridge height and outlet elevations.
- Removal of sediment that has accumulated in the WASCOB 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 WASCOB.
- Where vegetation is specified, regular mowing and control of trees and brush.
- Notification of hazards about steep slopes on the WASCOB.

REFERENCES

National Engineering Handbook, Part 650
Engineering Field Handbook, Chapters 6, 8, 14,
USDA Natural Resources Conservation Service.

NATURAL RESOURCES CONSERVATION SERVICE
CONSTRUCTION SPECIFICATION
WATER AND SEDIMENT CONTROL BASIN

Scope

The work shall consist of constructing the basin channel and ridge, and excavating, filling and shaping as required by the construction plans.

Location

The location of the water and sediment control basin shall be as shown on the construction plans or as staked in the field.

Site Preparation

All dead furrows, ditches, and gullies shall be filled prior to or as a part of construction. Old terraces, fencerows, brush, and tall standing vegetation shall be removed from the area occupied by the terrace ridge and the area from which the earthen construction material will be taken.

For fill heights of 6 feet and greater, the foundation area of the ridge will be thoroughly scarified to a minimum depth of 4 inches before placement of the fill material and before moisture is added, if necessary, so that the first layer of fill material can be bonded to the foundation.

Material

Earth fill material shall be free from frozen particles, roots, sod, brush, and other objectionable materials that might endanger the performance of the basin. The fill material shall have no rock particles larger than 3 inches in diameter.

The moisture content of the earth fill material shall be sufficient to permit satisfactory compaction. The moisture content can generally be considered as satisfactory if the fill material can be molded into a round ball between the hands without readily separating or squeezing out free water.

For broadbase ridges, required fill material shall come from the channel unless otherwise specified. For grassed back and narrow base ridges, fill material shall come from the downhill side of the ridge, except for cuts that are required to construct the channel to the specified grade and cross section.

Placement of Earthfill

All ridges shall be constructed to the planned

alignment, grade and cross-section shown on the plans, with the specified overfill for settlement and the channel graded to drain reasonably well. Any ditch or depression at the bottom of the back slope shall be filled and smoothed so that drainage will be away from the ridge. All fill cross sections shall conform to that specified for all stations. The ridge shall be compacted by routing the hauling and spreading equipment over the fill material in such a manner that the entire surface of the completed ridge will be traversed by not less than one tread/track of equipment. The channel, side slopes, ridge, cut areas, and fill areas shall be finished to a smoothness so the surface can be readily traveled upon by farm-type equipment.

When topsoil salvaging is specified, areas to receive topsoil shall be brought to within 4 inches of final grade, or as specified on the construction plans. Topsoil shall be evenly placed and spread over specified area to bring it to final grade.

Outlets

Underground tile outlets are to be installed at locations shown on the drawings or as staked in the field. Provisions must be made to prevent piping if underground conduits are located under ridges. Mechanical compaction, water packing, trench sidewall sloping, and installation and backfill of conduit trenches early enough to allow adequate settlement are methods that can be used. Refer to Construction Specifications 620, Underground Outlet, for detailed installation requirements.

Vegetation

A protective cover of vegetation shall be established on steep back slope and narrow-based terraces when specified in the design plans. Refer to Construction Specification 342, Critical Area Seeding, for detailed seeding requirements.

Utilities

The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

NRCS, Illinois

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