

NATURAL RESOURCES CONSERVATION SERVICE  
VIRGINIA CONSERVATION PRACTICE STANDARD

**STRUCTURE FOR WATER CONTROL**

(No.)

CODE 587

**DEFINITION**

A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water.

**PURPOSE**

The practice may be applied as a management component of a water management system to control the stage, discharge, distribution, delivery or direction of water flow.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies wherever a permanent structure is needed as an integral part of a water-control system to serve one or more of the following functions:

- Convey water from one elevation to a lower elevation within, to, or from a water conveyance system such as a ditch, channel, canal or pipeline designed to operate under open channel conditions. Typical structures: drops, chutes, turnouts, surface water inlets, head gates, pump boxes and stilling basins.
- Control the elevation of water in drainage or irrigation ditches. Typical structures: checks, flashboard risers and check dams.
- Control the division or measurement of irrigation water. Typical structures: division boxes and water measurement devices.

- Keep trash, debris or weed seeds from entering pipelines. Typical structure: debris screen.
- Control the direction of channel flow resulting from tides and high water or back-flow from flooding. Typical structures: tide and water management gates.
- Control the water table level, remove surface or subsurface water from adjoining land, flood land for frost protection or manage water levels for wildlife or recreation. Typical structures: water level control structures, flashboard risers, pipe drop inlets and box inlets.
- Convey water over, under, or along a ditch, canal, road, railroad or other barriers. Typical structures: bridges, culverts, flumes, inverted siphons and long span pipes.
- Modify water flow to provide habitat for fish, wildlife and other aquatic animals. Typical structures: chutes, cold water release structures and flashboard risers.
- Provide silt management in ditches or canals. Typical structure: sluice.
- Supplement a resource management system on land where organic waste or commercial fertilizer is applied.
- Create, restore or enhance wetland hydrology.

Virginia Conservation Practice Standard *Structure For Water Control (Code 587)* does not apply to the structural components of

irrigation pipelines, subsurface drains, and grade stabilization structures.

### CRITERIA

Establish vegetation complying with Virginia Conservation Practice Standard *Critical Area Planting (Code 342)* on all disturbed earth surfaces. Where soil, climate or site specific conditions preclude establishing permanent vegetation, use other protective means such as mulches or gravels.

Construct fence to protect the vegetation when necessary.

Do not install structures that have an adverse effect on septic filter fields.

Do not raise the water level upstream of water control structures without adjacent landowners' permission.

Design the structure with a capacity appropriate for the intended practice or purpose. The capacity must not be less than the drainage removal rates for drain systems such as field ditches or mains and laterals.

### CONSIDERATIONS

When planning, designing, and installing this practice, the following items should be considered:

- Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation and ground water recharge.
- Potential for a change in the rate of plant growth and transpiration because of changes in the volume of soil water.
- Effects on downstream flows or aquifers that would affect other water uses or users.
- Effects on the field water table to ensure that it will provide a suitable rooting depth for the anticipated crop.
- Potential use for irrigation management to conserve water.
- Effect of construction on aquatic life.
- Effects on stream system channel morphology and stability as it relates to

erosion and the movement of sediment, solutes and sediment-attached substances carried by runoff.

- Effects on the movement of dissolved substances below the root zone and to ground water.
- Effects of field water table on salt content in the root zone.
- Short term and construction-related effects of this practice on the quality of downstream water.
- Effects of water level control on the temperatures of downstream waters and their effects on aquatic and wildlife communities.
- Effects on wetlands or water-related wildlife habitats.
- Effects on the turbidity of downstream water resources.

Design alternatives presented to the client should address economics, ecological concerns and acceptable level of risk for design criteria as it relates to hazards to life or property.

### PLANS AND SPECIFICATIONS

Plans and specifications for installing structures for water control must be in keeping with this standard and describe the requirements for applying the practice to achieve its intended purpose.

The plan must specify the location, grades, quantities, dimensions, materials, and hydraulic and structural requirements for the individual structure. Provisions must be made for necessary maintenance. Care must be used to protect the surrounding visual resources. If watercourse fisheries are important, special precautions or design features may be needed to facilitate continuation of fish migrations.

Record all required information in an engineer field book, on a plan sheet or design computation sheet, or in another appropriate location.

### DESIGN DATA

1. Completed Environmental Evaluation (Form VA-EE-1) and subsequent requirements.
2. Soils investigation.
3. Survey and plot data: profile, cross-sections, topography, as needed.
4. Design computations, including purpose of practice and references used, drainage area and flow calculations, design elevations, appurtenance design, as applicable.
5. Plan view of site with existing and planned features, including dimensions, distances, etc.
6. Standard Cover Sheet (VA-SO-100A).
7. Materials and quantities needed. Identify borrow material and/or spoil area, as needed.
8. Vegetation and/or ground cover requirements.
9. Identification of needed Erosion & Sediment Control measures.
10. Supplemental practices required.
11. Virginia Conservation Practice Specifications (700 Series).
12. Operation and Maintenance Plan.

#### CHECK DATA

1. As-built survey.
2. As-built plans including dimensions, types and quantities of materials installed, and variations from design. Include justification for variations.
3. Locations of appurtenant practices.
4. Adequacy of vegetation and/or ground cover.
5. Complete as-built section of Cover Sheet.

#### OPERATION AND MAINTENANCE

Develop, provide, and review a site specific operation and management plan with the land

manager. Include but do not limit the plan to the following: Structures will be checked and necessary maintenance, including removal of debris, will be performed after major storms and at least semi-annually.

Adequately describe the water level management and timing wherever applicable.

#### REFERENCES

USDA-Natural Resources Conservation Service. National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 1, Engineering Surveys, and Chapter 14, Water Management (Drainage).

USDA-Natural Resources Conservation Service. Technical Release 62- Engineering Layout, Notes, Staking and Calculations (January 1979).

USDA-Natural Resources Conservation Service. *Virginia Drainage Guide*.

NRCS, Virginia, *Plant Establishment Guide for Virginia*.

USDA-Natural Resources Conservation Service. Electronic Field Office Technical Guide (eFOTG), Section IV [Online]. Available at <http://www.nrcs.usda.gov/technical/eFOTG>.

USDA-Natural Resources Conservation Service. Virginia 700 Series Construction Specifications. [On-line]. Available at <http://www.nrcs.usda.gov/technical/eFOTG>

USDA-Natural Resources Conservation Service. Virginia, General Manual-190, Part 410, Compliance with NEPA.

USDA-Natural Resources Conservation Service, National Engineering Handbook, Part 624, Chapter 10, Water Table Control.

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