

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**STRUCTURE FOR WATER CONTROL**

(No.)  
CODE 587

**DEFINITION**

A structure in an irrigation, drainage, or other water management systems that conveys water, controls the direction or rate of flow, or maintains a desired water surface elevation.

**PURPOSES**

This practice may be applied as part of a resource management system to accomplish the following purpose:

To control the stage, discharge, distribution, delivery, or direction of flow of water in open channels or water use areas. Also used for water quality control, such as sediment reduction, debris exclusion or temperature regulation, as well as exclusion of fish from diversion flows. These structures are also used to protect fish and wildlife and other natural resources.

**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:

- To convey water from one elevation to a different 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.
- To control the division or measurement of irrigation water. Typical structures: division boxes and water measurement devices.
- To control the direction of channel flow resulting from tides and high water or backflow from flooding. Typical structures: tide and flood gates.
- To 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.
- To 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.
- To provide silt management in ditches or canals. Typical structure: sluice.
- To supplement a resource management system on land where organic waste or commercial fertilizer is applied.
- To create, restore, or enhance wetland hydrology
- To control the elevation of water in drainage or irrigation ditches. Typical structure: checks.
- To keep trash, debris, weed seeds, or fish from entering pipelines and channels. Typical structure: debris or fish screens.
- To modify water flow to provide habitat for fish, wildlife, and other aquatic animals. Typical structures: deflectors, chutes, cold

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water release, or structures to make pools and riffles.

- To allow the withdrawal of water while providing for the safety and relatively unimpeded movement of anadromous and resident fish. Typical structures: rotary drum screens, vertical and non vertical fixed plate screens, vertical traveling screens, pump screens, portable screens, and infiltration galleries.

## CRITERIA

Planned work shall be in conformance with all federal, state, and local laws, rules and regulations.

The planned work shall comply with General Manual 420 part 401, Cultural Resources.

Structures shall be designed on an individual job basis, or applicable NRCS standard drawings shall be adapted, to meet site conditions and functional requirements. They shall be part of an approved and overall engineering plan for irrigation, drainage, wildlife, recreation, channel improvement, or similar purposes.

The plan shall specify the location, grades, dimensions, materials, and hydraulic and structural requirements for the individual structure. Provisions must be made for necessary maintenance. Care must be used to insure that the area's visual resources are not damaged.

If soil and climatic conditions permit, a protective cover of vegetation shall be established on all disturbed earth surfaces. If soil or climatic conditions preclude the use of vegetation and protection is needed, nonvegetative means, such as mulches or gravel, may be used. In some places, temporary vegetation may be used until permanent vegetation can be established. The structure can be fenced, if necessary, to protect the vegetation. Seedbed preparation, weeding, fertilizing, and mulching shall comply with the instructions in technical guides.

Vegetation shall be established in compliance with Critical Area Treatment Standard (342).

Structures shall not be installed that have an adverse effect on septic filter fields.

The water level upstream of water control structures shall not be raised on adjacent landowners without their permission.

Structures which divert flow from waters that support fish will require screens to keep fish out of the diverted flow unless otherwise exempted by the Washington Department of Fish and Wildlife. These screens will be designed and installed in accordance with the "Fish Protection Screen Guidelines for Washington State."

In addition, if the above structure by itself, or in combination with a dam or weir, blocks the flow of a channel which supports fish, safe upstream and downstream fish passage will be provided past the structure(s) unless otherwise permitted by the Washington Department of Fish and Wildlife. See "Fishway Design Guidelines" and "Fish Passage at Road Culverts" for information. Also, see Practice 396, Fish Passage and 348, Dam, Diversion.

## 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.
- Short-term and construction-related effects of this practice on downstream 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 the potential temperature effects on aquatic and wildlife communities.
- Effects on wetlands or water-related wildlife habitats.
- 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 shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

The plan shall 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.

## OPERATION AND MAINTENANCE

- An operation and management plan shall be provided to and reviewed with the land manager. The plan shall be site-specific and include, but not be limited, to the following:
- Structures will be checked and necessary maintenance, including removal of debris, shall be performed after major storms and at least semi-annually.

- Water level management and timing of water use shall be adequately described where applicable.
- Fish screen operation and maintenance plans must meet requirements as stated in "*Fish Protection Screen Guidelines for Washington State.*"
- Where fish passage is required at a water control structure or at a dam to which it is attached, minimum passage flows and maximum jump heights for the targeted fish shall be adequately described.

## REFERENCES

The following references can be found at:  
<http://www.wa.gov/wdfw/hab/ahg>

Bates, Ken. 1999. Fish Passage Design at Road Culverts. *for* Washington Department of Fish and wildlife (WDFW)

Bates, Ken. 2000. Fishway Guidelines for Washington State. *for* WDFW

Easterbrooks, John and K. Bates. 1998. Screening Requirements for Water Diversions. *for* WDFW