

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

STRUCTURE FOR WATER CONTROL

(No.)

CODE 587

DEFINITION

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

SCOPE

This standard applies to the structures normally installed in a well-planned irrigation or drainage system, wildlife facility or other management systems for the conveyance, flow control, or level regulation of water. It covers the planning and functional design of such water control structures but not the detailed design criteria or construction specifications for specific structures. It does not apply to structural components of IRRIGATION PIPELINES (430) or SUBSURFACE DRAINS (606) or GRADE STABILIZATION STRUCTURES (410).

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 or temperature regulation. 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 an irrigation, drainage, or other water-control systems to serve one or more of the following functions:

1. To conduct water from one elevation to a lower elevation within, to, or from a ditch, channel, or canal. Typical structures: drops, chutes, turnouts, surface water inlets, head gates, pump boxes, stilling basins.
2. To control the elevation of water in drainage or irrigation ditches. Typical structure: checks.
3. To control the division or measurement of irrigation water. Typical structures: division boxes and water measurement devices.
4. To keep trash, debris, or weed seeds from entering pipelines. Typical structure: debris screens.
5. To control direction of channel flow resulting from tides and high water or backflow from flooding. Typical structure: tide and drainage gates.
6. To control the level of a water table or to remove surface or subsurface water from adjoining land, to flood land for frost protection or to manage water levels for wildlife or recreation. Typical structures: water level control structures, pipe drop inlets, box inlets,
7. To provide water control for recreation or similar purposes.
8. To convey water over, under, or along a ditch, canal, road, railroad, or other barrier. Typical structures: bridges, culverts, flumes, inverted siphons.
9. To modify water flow to provide habitat for fish, wildlife, and other aquatic animals. Typical structures: deflectors, chutes, cold water release, or structures to make pools and riffles.

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

STRUCTURE FOR WATER CONTROL (587)-2 Statewide

DESIGN CRITERIA

The design of the structure shall comply with all state laws pertaining thereto.

Site Selection

The location will be such that the structure will give the desired protection or otherwise serve the purpose for which it is being designed. When structure is a part of a wildlife habitat development, the site location will be determined by the topography of the area and the wildlife habitat requirements.

Necessary foundation investigations shall be made as a part of site selection. The extent of these investigations will depend on the size and importance of the structures, the geology of the area and the findings during preliminary investigation. The foundation material shall have the required supporting strength, adequate resistance to sliding and piping and should be reasonably homogeneous so as to prevent differential or uneven settlement of the structure.

Runoff

Where the peak runoff is a necessary consideration in the design, it shall be calculated using the data and instructions contained in the Hydrology Section of the Engineering Field Manual.

Capacity

Structures shall have the capacity required to carry the design flow safely, control erosion where this may be one of its purposes, remain stable and maintain the upstream water surface within the allowable limits.

Calculations shall be made using current instructions including Engineering Field Manual. When structure is planned to increase crop (grass) production by controlling the water level, proper consideration must be given to the inlet (crest) elevation, and the area which will be inundated by structure in order to provide a sound ratio between area above that will be benefited and the area of crop (grass) lost by inundation.

Structural Design

Standard plans shall be used where applicable. Special designs as approved by the State Conservation Engineer shall be prepared for those structures which exceed the size or capacity of the standard applicable plans.

Materials

Structures may be constructed of reinforced concrete, rock, masonry, concrete blocks with or without reinforcing, metal or concrete pipe or treated lumber. Under certain conditions - depth of flow, bottom width of structure, and height of fall in water surfaces, as shown in Standard Structural Plans, Engineering Field Manual, Appendix No. 2 - non-reinforced concrete can be used in structures except in drive-thru irrigation structures, where reinforced concrete shall always be used. Any material used must meet the applicable material specification. Material selection shall be based on the following factors:

1. The required life of the structure.
2. The pH and salinity of the soil.
3. An annual cost comparison which recognizes all of the costs, including maintenance and replacement, for structures built of the different available materials.

PLANS AND SPECIFICATIONS

All specifications shown on standard plans will be followed.

Applicable specifications to be provided for each job will be selected from those listed in the index to Nebraska Construction and Material Specifications.