

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

**SPRING DEVELOPMENT**

(No.)

**CODE 574**

**DEFINITION**

Improving springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities.

**SCOPE**

This standard applies to springs and seeps developed as source of water. It does not apply to troughs or tanks (614) or to pipelines (516).

**PURPOSE**

Mainly to improve the distribution of water or to increase the quantity of water for livestock or wildlife. Also to obtain water for irrigation if water is available in a suitable quantity and quality.

**CONDITIONS WHERE PRACTICE APPLIES**

Developments shall be confined to springs or seepage areas that can furnish a dependable supply of suitable water during the planned period or periods of use.

The need for, and feasibility of, protection from flooding, sedimentation, and contamination shall be considered in determining the suitability of a site for development.

**DESIGN CRITERIA**

Fracture and Tubular Springs

If water issues from rock fractures, the individual openings shall be cleaned and enlarged, as needed, to provide an increase in flow. The water from these individual openings shall be collected and conveyed to a central sump or spring box by means of a tile or perforated pipeline or by a gravel-filled ditch. The collection works shall be constructed an adequate distance below the elevation of the openings to permit free discharge.

If water issues from a single opening, such as a solution channel in a soluble rock formation, the opening shall be cleaned or enlarged, as needed. A collection system usually is not required, but a spring box or a sump shall be installed at an elevation sufficiently low that water will not pond over the spring opening to a depth that will materially reduce the yield.

Perched or Contact Springs

Perched or contact springs occur where an impermeable layer outcrops beneath a water-bearing permeable layer. Intercepting and collecting the flow from the water-bearing formation shall develop these springs. Collection trenches are used for developing these types of springs.

### Artesian Springs

Artesian springs shall be developed by removing obstructions, cleaning or enlarging joints of fractures, or by lowering the outlet elevation. Sumps and spring boxes shall be located so as to hold ponding over the spring outlet to a minimum.

### Collection Systems

Where a collection trench along the outcrop of the waterbearing formation is to be used, the trench shall be at least 2 ft. wide and dug to a depth that extends into the impervious layer (except for solid rock or thin impervious layers) not less than 6 in. The trench shall be backfilled with 4 in. of well-graded gravel or stone filter material and smoothed to grade of the collector pipe. An impervious cutoff wall of well-tamped clay, masonry, concrete, plastic liner, or other suitable materials shall be constructed along the downstream side of the trench if needed to ensure that the flow enters the collection system. Filter material shall not be less than 6 in. thick on the sides and top of the collector pipe.

The collection system shall consist of drain tile or perforated pipe of not less than 3 in. in diameter. An exception is where the impervious layer is solid rock. In such cases, crushed rock or gravel at least 15 in. in both width and depth may be used in lieu of the tile or perforated pipe. The outlet pipe for the collection system shall be watertight and an impervious cutoff wall will be installed along the outlet pipe. The cutoff wall shall be of concrete at least 8 in. thick, tamped clay at least 2 ft. thick, or a plastic membrane at least 10 mill. thick. The minimum projection of the cutoff wall shall be 2 ft. and shall be installed perpendicular to the centerline of pipe. A grade of at least 0.1 percent shall be provided throughout the collection system. The collection system shall outlet into a spring box.

### Spring Boxes

Spring boxes shall be of durable material and shall have a tight, removable cover. The boxes shall have a minimum cross sectional area of 1-1/2 sq. ft.

The floor of the spring box shall not be less than 6 in. below the outlet of the collection system.

Spring boxes for perched springs shall be floored with concrete unless the underlying material is solid rock or other stable impervious material.

### Outlets

The outlet pipe from a spring box shall be placed not less than 6 in. above the floor of the box to provide a sediment trap. However, the outlet must not be so high as to cause a head on the spring that would reduce flow. The outlet pipe shall be installed so as to ensure a watertight connection with the spring box. The pipe shall comply with Engineering Standard 515-Pipeline. The outlet pipe shall be designed with a grade(s) of at least 0.5% without sags or high spots. Measures required to protect the development from damage by freezing, flooding, sedimentation, contamination, and livestock shall be included in the design.

For sites with strong spring flows that will exceed the capacity of the outlet pipe (to the tank), an overflow pipe shall be installed at the spring box. The overflow pipe shall conduct the excess water to a stable outlet. At the outlet of the overflow pipe, use a rigid pipe with a minimum length of 8 ft. and equipped with a suitable animal guard.

PLANS AND SPECIFICATIONS

**Plans and specifications for installing spring developments shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. All materials to be used on the job will be listed on the plan with the appropriate ASTM or other suitable designation. (Refer to Materials Specification of Engineering Standard 606.)**

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSTRUCTION SPECIFICATION**

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All loose rock, sediment, logs, and vegetation than can obstruct the free discharge of the spring shall be removed and disposed of so that it will not endanger the spring development.

Collection trenches, drain tiles, perforated pipe lines, sumps, and spring boxes shall be constructed to the elevations and grades shown on the plans.

Crushed rock or gravel for collection systems and sand-gravel material for filters shall be composed of clean, hand particles. O.D.O. T. Aggregate Specifications for size 67, 68, and 78 meet the requirements for a well-graded filter material.

Construction operations shall be carried out in such a manner that erosion and soil and water pollution are minimized and held within legal limits.