

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

HILLSIDE DITCH

(Ft.)

CODE 423

DEFINITION

A channel that has a supporting ridge on the lower side, constructed across the slope at defined gradient and horizontal or vertical interval, with or without a vegetative barrier.

PURPOSE

To safely control the flow of water by diverting runoff from upland sloping areas to a stable outlet.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to steeply sloping sites where surface flow is damaging sloping upland, and there is sufficient soil depth for constructing a hillside ditch system. Hillside ditches shall not be used to provide protection to buildings, roads, or other improvements.

CRITERIA

Location. Locate hillside ditch systems to fit land conditions, soil texture, and field slope, and to drain to a stable outlet.

Outlets. Locate or establish adequate outlets prior to the construction of hillside ditches, with enough capacity to dispose of discharged water without creating an erosion hazard. An outlet may be a grade control structure, a natural or constructed waterway, a stable watercourse, or a stable disposal area such as a well-established pasture. Criteria for grassed waterways are found in NRCS Conservation Practice Standard, Grassed Waterway (412).

Length. The maximum allowable length of ditch draining in one direction is 400 feet, unless an extension is necessary to reach a stable outlet.

In no case shall a ditch exceed 500 feet in length.

Permissible velocities. Design the ditch to be compatible with the erosion resistance characteristics of soils of the site.

Maximum channel velocities shall not exceed those recommended in NRCS National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 9, Diversions.

Horizontal spacing

Use Table 1 to determine the maximum horizontal spacing.

TABLE 1

Land Slope (percent)	Maximum Spacing (feet)
<12	40
12-25	35
25-40	25
>40	20

Capacity

At a minimum, hillside ditches shall safely carry the peak discharge from a 10-year frequency, 24-hour duration, rainfall event.

CONSIDERATIONS

When planning this practice, consider the following as applicable:

Effects upon components of the water budget, especially effects on volumes and rates of runoff, infiltration, evaporation, transpiration,

deep percolation, and ground water recharge.

Filtering effects of vegetation on movement of sediment and dissolved and sediment-attached substances.

Short-term and construction-related effects of this practice on the quality of downstream water.

Steep fields with sandy soils may benefit more from NRCS Conservation Practice Standard, Vegetative Barrier (601), than from hillside ditches.

Potential for development of saline seeps or other salinity problems resulting from increased infiltration in the presence of restrictive layers.

Potential to affect significant cultural resources.

Cultural Resources

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

<http://www.nrcs.usda.gov/technical/cultural.html> is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects.

Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing hillside ditches 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 locations, grades, dimensions, quantities, and materials requirements for the hillside ditch. Provisions must be made for necessary maintenance.

OPERATION AND MAINTENANCE

An Operation and Maintenance plan shall be prepared for use by the landowner or operator. The plan shall include provisions to address the following, as a minimum:

Maintain hillside ditch capacity, ridge height, and the outlet capacity.

Remove vegetative growth or debris interfering with the proper functioning of the ditch, as necessary.

Remove debris interfering with the outlet operation, as necessary.

Maintain well-established vegetation in the outlet at all times, to provide stability.

Maintenance and repairs should be done on a routine basis with special emphasis on inspection as soon as possible after heavy rainfall events. Sediment accumulated in the ditches shall be removed and disposed of properly, as needed, to maintain the required minimum cross section and grade.

REFERENCES

Temple, D.M., K.M. Robinson, R.M. Ahring, A.G. Davis. 1987. Agriculture Handbook 667, Stability Design of Grass-Lined Open Channels. USDA-Agricultural Research Service.