

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
DRAFT
SURFACE DRAINAGE, FIELD DITCH
(Ft.)

CODE 607

DEFINITION

A graded ditch for collecting excess water in a field.

PURPOSE

Collect or intercept:

- excess surface water, such as sheet flow from natural and graded land surfaces or channel flow from furrows, and carry it to an outlet;
- excess subsurface water and carry it to an outlet.

CONDITIONS WHERE PRACTICE APPLIES

Federal, State and Local Laws and Permits

Design and construction activities shall comply with all federal, state, and local laws, rules, and regulations governing activities in or along streams, pollution abatement, health, and safety.

The owner or operator shall be responsible for securing all required permits or approvals and for performing all planned work in accordance with such laws and regulations. NRCS employees are not to assume responsibility for procuring these permits, rights, or approvals, or for enforcing laws and regulations. NRCS may provide the landowner or operator with technical information needed to obtain the required rights or approvals to construct, operate, and maintain the practice.

Permits may be required from the following agencies when obstruction removal is performed within the boundaries of a stream or floodplain or if burning is required:

1. U.S. Army Corps of Engineers
2. WV Department of Natural Resources
3. WV Public Lands Corporation
4. US Fish and Wildlife Service
5. Local state and county ordinances

Work near waters where there is a present or possible presence of endangered or threatened species require notification and collaboration with the USFWS prior to implementation.

Work in or adjacent to "Waters of the US" may require a WV Public Land Corporation Application, a Nation Wide Permit or appropriate Individual Section 404 permit from the USCOE prior to implementation of the project. All required permits shall be approved prior to construction implementation.

Applicable sites are flat or nearly flat and:

1. Have soils that are slowly permeable (low permeability) or that are shallow over barriers such as rock or clay, which hold or prevent ready percolation of water to a deep stratum. *Refer to the Drainage Handbook for West Virginia for applicability of surface drainage and design information.*

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Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide \(e-FOTG\)](#) located on our web site. *Note: Bold italics is information added or changes made to the National Conservation Standard by WV.*

2. Have surface depressions or barriers that trap rainfall.
3. Have insufficient land slope for ready movement of runoff across the surface.
4. Receive excess runoff or seepage from uplands.
5. Require the removal of excess irrigation water.
6. Require control of the water table.
7. Have adequate outlets available for disposal of drainage water by gravity flow or pumping.

CRITERIA

General Criteria Applicable to All Purposes

Drainage field ditches shall be planned as integral parts of a drainage system for the field served and shall collect and intercept water and carry it to an outlet with continuity and without ponding. Compliance with federal, State, and local laws and regulations is required.

Investigations. An adequate investigation shall be made of all sites.

Investigation surveys and design shall be in accordance with Chapters 1 and 5 of the Engineering Field Handbook. Installations shall be based on a plan showing locations, grades, depths, cross sections, soils, and other pertinent data.

Location. Ditches shall be established, insofar as topography and property boundaries permit, in straight or nearly straight courses. Random alignment may be used to follow depressions and isolated wet areas of irregular or undulating topography. Excessive cuts and the creation of small irregular fields shall be avoided.

On extensive areas of uniform topography, collection or interception ditches shall be installed as required for effective drainage.

Design. The size, depth, side slopes, and cross section area shall:

1. Be adequate to provide the required drainage for the site.
2. Permit free entry of water from adjacent land surfaces without causing excessive erosion.
3. Provide effective disposal or reuse of excess irrigation water (if applicable).
4. Conduct flow without causing excessive erosion.
5. Provide stable side slopes based on soil characteristics. ***Side slopes shall be 4:1 or flatter.***
6. Permit crossing by field equipment if feasible.
7. Permit construction and maintenance with available equipment.
8. ***Provide a non erosive ditch. The minimum grade shall be greater than 0.0005. The elevation of the bottom of the outlet for each ditch shall be no less than 0.5 ft below the elevation of the bottom of the ditch 20 ft. distant from point of discharge.***
9. ***The minimum depth is specified by the Drainage Handbook for West Virginia.***
10. ***Farming operations should be parallel to all ditches where feasible; in the case of cross slope ditches it is mandatory. Farm equipment may cross the field ditch. Where crossings are anticipated, 8:1 side slopes will facilitate usage.***

Drainage field ditches must have sufficient capacity to carry and dispose of the runoff from the contributing watershed in sufficient time to permit crop production on the area treated. Runoff will be determined from drainage runoff curves, Exhibit 14-2, or Exhibit 14-2.1 of the Engineering Field Handbook. The minimum drainage coefficient will be the curve "C" in accordance with the Drainage Handbook for West Virginia. Curves "A" and "B" may be used where a higher degree of drainage or protection from flooding is justified.

The design for capacity and stability will be calculated by Manning's equation in accordance with the procedures outlined in detail in Chapter 14 in the Engineering Field Handbook. Capacities may be determined from Exhibit 14-6.2, Chapter 14, Engineering Field Handbook, in lieu of computed values. The shape of the ditch shall be "V" type.

CONSIDERATIONS

When planning this practice, the following items should be considered where applicable:

- Potential impacts on downstream flows or aquifers that would affect other water uses or users.
- Potential water quality impacts for soluble pollutants, sediments and sediment-attached pollutants.
- Potential for uncovering or redistributing toxic materials.
- Impacts on cultural resources
- Effects on wetlands or water-related wildlife habitats.
- Effects of water level control on soil water, downstream water temperature or salinity of soils.
- The need for riparian buffers, filter strips and fencing.
- Effects on water budget components, especially the relationships between runoff and infiltration.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing drainage field ditches shall be in keeping with this standard and shall describe the requirements for properly installing the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

A site-specific operation and maintenance plan shall be provided to and reviewed with the landowner(s) before the practice is installed.

The plan shall adequately guide the landowner(s) in the routine maintenance and operational needs of the ditch(es). The plan shall also include guidance on periodic inspections and post-storm inspections to detect and minimize damage to the ditch(es).

Operation and maintenance considerations for field ditches shall be included in a management plan for the whole drainage system, including ditches, outlets, and appurtenances. These considerations should include, but not be limited to, the following:

1. ***Periodic inspection.***
2. ***Repair of rills, gullies, and washouts, as needed.***
3. ***Mowing or selectively grazing ditches in pasture or hayland.***
4. ***Removing sediment deposits, as needed.***
5. ***Reshaping of ditches if necessary after several years.***

REFERENCES

WV5-Engineering Field Handbook, Appendix A- Quick Reference Design and Construction Support Data for Conservation Practices

Drainage Handbook for West Virginia

Conservation Practice Surface Drainage, Field Ditch (607) Scope of Work

NEH-20 or WV "700" Series Specifications

**NRCS Conservation Practice Standard,
Channel Bank Vegetation, Code 322.**

**NRCS National and State Utility Safety
Policy (NEM Part 503-Safety, Subpart A -
Engineering Activities Affecting Utilities
503.00 through 503.06)**

**<http://policy.nrcs.usda.gov/> Handbooks:
Title 210 – Engineering; NRCS National
Engineering Handbook; Section 5 –
Hydraulics, Part 630 Hydraulics
Part 630 Hydrology
Part 650 Engineering Field Handbook
Chapter 14, Engineering Field Handbook**

**Title 190- Ecological Sciences; Part 601-
National Cultural Resources Procedures
Handbook**

610- Environmental Compliance Handbook

**WV e-FOTG Section IV- Practice Standards
and Specifications**

**<http://www.nrcs.usda.gov/technical/efotg/>
(click on WV from the US map)**

**NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION
PRACTICE GENERAL SPECIFICATIONS
Surface Drainage, Field Ditch
(FT)
No. 607**

Field Ditch Specifications

Areas to be excavated and areas to be occupied by spoil shall be cleared of trees, brush, and other debris as required for construction and maintenance.

Ditches shall be constructed to the line, grade, and section shown on the drawings. The excavated surfaces shall be reasonably uniform and smooth.

Spoil shall be placed or graded in such a manner that surface water may enter the ditch freely without scour. Spoil shall be used to fill depressions or wasted on down slope side of ditch.

All combustible refuse shall be burned or buried. When buried, all roots, brush, stumps, stones, and similar material shall be placed a minimum of 18 inches below finished grade.

Construction shall be carried out in such a manner that erosion and air and water pollution will be minimized and held within legal limits. This shall be done by:

- 1. Placing spoil to prevent sloughing or washing into the ditch or water course.*
- 2. Keeping chemicals, fuel, lubricants, sewage, and waste materials out of the ditch and drainage ways.*
- 3. Establishing vegetation on all designated areas as soon as possible after exposure or disturbance, especially on ditch side slopes.*
- 4. Establishment of vegetation shall be in accordance with the CP Critical Area Planting (342).*

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