

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

Land Smoothing (ACRE) No. 466

Definition

Removing irregularities on the land surface by use of special equipment.

Purpose

Improve surface drainage, provide for more effective use of precipitation, obtain more uniform planting depths, provide for more uniform cultivation, improve equipment operation and efficiency, improve terrace alignment, and facilitate contour cultivation.

Conditions Where Practice Applies

This practice applies on areas where depressions, mounds, old terraces, turn rows, and other surface irregularities interfere with the application of needed soil and water conservation and management practices.

It is limited to areas having adequate soil depth or where topsoil can be salvaged and replaced.

Planning Considerations

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, evaporation, and infiltration.
2. Potential for changes in plant growth and transpiration because of changes in the volume of soil water.

Water Quality

NRCS, October 1980

1. Effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff.
2. Effects on the use and management of nutrients and pesticides.
3. Effects on downstream water quality.
4. Potential for earth moving to uncover or redistribute toxic materials, such as saline soils.
5. Effects on the visual quality of downstream water resources.

Federal, State, and Local Laws¹

Design and construction activities shall comply with all federal, state, and local laws, rules, and regulations governing pollution abatement, health, and safety. The owner or operator shall be responsible for securing all required permits or approvals and for performing 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:

1. ***West Virginia Department of Health***
2. ***West Virginia Department of Agriculture***

Design Criteria

The extent of rough grading required and tolerances of the finished smoothing job shall be

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in keeping with the requirements of the planned cropping system.

An adequate field investigation and survey shall be done to determine the following:

- 1. Location and scope of the land smoothing operation.***
- 2. Limitations due to soil depth. (soil borings may be necessary).***
- 3. Location of any appurtenant structures, conservation practices, and erosion and sediment control measures to be installed in conjunction with the land smoothing operations.***

Depth of cuts shall be controlled so that exposure of subsoil and parent material is minimized. Surface soils shall be removed and stockpiled for reapplication to areas where subsoil or parent material are exposed.

Compaction of fill areas will be done by routing the construction equipment over these areas. Compaction will be adequate to prevent ponding that would result from settlement but not so intense that overcompaction and poor subsurface drainage results.

The length and degree of finished slopes shall be suited to the final land use and particular soil type.

Erosion shall be controlled within allowable limits using vegetative and structural measures as required. When the smoothed land will not immediately be planted to crops, or when no further construction activity will occur, the establishment of vegetation shall be planned. This may be accomplished by using the WV Standard for Critical Area Planting (342) or the WV standard for Pasture and Hayland Planting (512).

Plans and Specifications

Plans and specifications for land smoothing shall be in keeping with this standard and shall

describe the requirements for applying the practice to achieve its intended purpose.

Specifications may be developed from NEH-20 or the West Virginia 700 Series, but normally the attached specification will suffice.

Plans and specifications should show or describe the following, as a minimum.

- 1. Limits of construction activity.***
- 2. Extent of removal and disposal plans for excess vegetative matter and trash.***
- 3. Depth of removal and stockpiling requirements for surface soil.***
- 4. Extent and depth of disking required.***
- 5. Requirements for fill areas including lift thickness, compaction specified, overfill, and moisture content.***

6. Vegetative measures.

7. Erosion control measures.

8. Pollution abatement for water and air.

Operation and Maintenance

Land smoothing is normally done as preparation for, or in conjunction with, other conservation practices. The operation and maintenance of smoothed land may be incorporated into the O&M plan for those other practices. Items that should be considered include:

- 1. Periodic inspections.***
- 2. Repair of eroding areas.***
- 3. Filling of minor depressions that result from settlement or tillage.***
- 4. Repair, fertilization, and liming of vegetation (if vegetation is part of the permanent practice).***

¹Bold italics is information added to the National standard by West Virginia.

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE GENERAL SPECIFICATIONS

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The land to be smoothed shall be cleared of excess vegetative matter and trash.

Surface soil shall be removed from the area to the depth shown on the drawings and stockpiled on the outer perimeter of the work area.

If required, the ground surface shall be plowed or disked prior to the smoothing operation.

At least three passes of a land plane or leveler should be made over the land to be smoothed. The passes should consist of one on each diagonal and one generally in the direction of drainage.

Irregularities that would not be removed by three passes of a land plane or leveler should be rough graded to a more uniform topography prior to the smoothing operation.

Lift thickness, compaction, overfill allowance, and moisture content of the fill material shall be as described on the drawings.

All smoothing operations shall be done to the neat lines and grades shown on the drawings.

Construction shall be done in such a way that chemicals, fuels, lubricants, and waste materials will not pollute air and water. Erosion, air pollution, and water pollution shall be minimized and held within legal limits.

Construction methods and vegetative measures that prevent erosion and control sediment shall be used.

A protective cover of vegetation shall be established on all exposed surfaces where soil and climatic conditions permit. Lime and fertilizer shall be spread at the specified rate and shall be disked into the soil to a depth of 4 inches to prepare a seedbed. Seed and mulch shall be applied at the specified rate. In some cases, temporary vegetation may be used for protection until conditions are suitable for establishment of permanent vegetation.

Where soil or climatic conditions do not permit the establishment of vegetation, and protection is needed, nonvegetative means such as mulches or gravel may be used.

All work shall be done such that the installed practice gives a completed and finished appearance.