

## NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

### Precision Land Forming (ACRE) No. 462

#### Definition

Reshaping the surface of land to planned grades.

#### Purpose

To improve surface drainage, provide more effective use of rainfall, facilitate installation of more workable drainage systems, reduce the incidence of mosquito infestation, control erosion, improve water quality, and prevent damage to land by water-logging.

#### Conditions where Practice Applies

On all land that is suitable for the purpose required and where precision land forming is practical. Soils shall be of sufficient depth and of suitable textures so that after precision land forming is completed an adequate root zone remains to permit the planned use of the land and application of proper conservation measures, soil amendments, and fertilizer.

All precision land forming shall be planned as an integral part of an overall system to facilitate the conservation use of soil and water resources.

#### ***Federal, State, and Local Laws<sup>1</sup>***

***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***

NRCS, October 1980

***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***

#### Planning Considerations

##### Water Quantity

1. Effect on the water budget, especially on volumes and rates of runoff, infiltration, deep percolation, and evaporation.
2. Potential for changes in plant growth and transpiration resulting from changes in the volume of soil water.

##### Water Quality

1. Effects on erosion and the movement of sediment and soluble and sediment-attached substances carried by runoff.
2. Effects from the use and management of nutrients and pesticides on surface and ground water quality.
3. Short-term and construction effects of installation on downstream water resources.
4. Potential for earth moving to uncover or redistribute toxic materials, such as saline soils, and make them available to water or plants.
5. Downstream temperature changes.

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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.

6. Effects on the visual quality of downstream water resources.

### **Design Criteria**

Design and installation shall be based on detailed engineering surveys, investigation, and layout. If the land is to be formed for more than one purpose, it must be formed to meet the requirements of the most restrictive purpose and crop.

All forming work must be designed within the slope limits required for the proposed use and provide for the removal of excess surface water. If other conservation practices such as grassed waterways, drainage field ditches, and filter strips are needed to accomplish the stated purpose, they shall be included in the plans for improvement.

**Slope requirements.** Slope may be uniform in the direction of flow or may increase or decrease.

Reverse grades in the direction of planned water flow shall not be permitted. Short level sections are permissible to meet field conditions. Cross slopes must be designed so that "breakthroughs" from rainfall runoff are held to a minimum.

***Slopes of graded surfaces shall not exceed 2.0 percent nor be less than 0.1 percent except for short level sections. Slope lengths shall be limited to that which will confine soil losses within the allowable limits for the land use intended.***

**Slope to control erosion caused by runoff from rainfall.** Design field grades shall be such that erosion caused by runoff from rainfall can be controlled within the limits permissible for conservation farming. When benching between land-formed plots exceeds 1 ft (304 mm) a permanent grassed area or border ridge must be left between the plots to reduce the possibility of gully erosion.

**Surface drainage.** All precision land-forming systems shall include plans for removing or otherwise providing for control of excess water.

Designs must provide field elevations and field grades that will permit proper functioning of the planned drainage facilities.

***Adequate outlets shall be available. Outlets shall be designed according to practice standards for Drainage (607 or 608).***

**Borrow computations.** Excavation and fill material required for or obtained from such structures as ditches, ditch pads, and roadways shall be considered part of the precision land-forming design, and the appropriate yardage shall be included when balancing cuts and fills and determining borrow requirements.

### **Plans and Specifications**

Plans and specifications for precision land forming shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purposes.

### **Operation and Maintenance**

***An operation and maintenance plan shall be developed which will insure that the area remains in a condition suitable for its intended use. Surface drainage shall be maintained. Outlets shall be maintained in their original condition.***

***<sup>1</sup>Bold italics is information added to the National standard by West Virginia.***

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

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**Site Preparation**

The land to be formed shall be cleared of brush, crop residue, trash, and vegetative material that can materially reduce the effectiveness of forming operations.

All construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits.

After cuts and fills are completed, the land shall be smoothed to remove minor irregularities.

**Borrow Location**

Soil for land-forming operations shall be obtained from the designated cut areas in the field or from other designated borrow areas as specified in the plan.

**Finished Grades**

All land-forming work shall be finished according to the design and to the tolerances specified. The completed job shall be workmanlike and present a good appearance.

**Land Forming Operations**

The land shall be formed to the designed grade or grades. Fills of more than 6 in. (152 mm) shall be placed by spreading the soil in successive layers. Land-forming operations shall not be performed when the ground is frozen or if soil moisture conditions are such that they could cause excessive damage to the soil structure, resulting in poor crop growth or detrimental settlement.