

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**PRECISION LAND FORMING**

(Ac.)

**CODE 462**

**DEFINITION**

Reshaping the surface of land to planned grades.

**PURPOSE**

To improve surface drainage and control erosion.

**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.

This standard does not apply in areas needing Conservation Practice Land Smoothing (466) or Conservation Practice Irrigation Land Leveling (464).

**CRITERIA**

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

Design and installation shall be based on adequate engineering surveys and investigations. Laser equipment may be used for making necessary surveys. 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 not exceeding 200' are permissible to meet field conditions. The planned row grade shall not exceed 0.5 foot per 100 feet. A range of 0.1 to 0.3 foot per 100 feet is usually recommended, depending on soil conditions and the crops to be grown. On easily eroded soils, row grades above 0.3 foot per 100 feet shall not be used.

Cross grades or grades approximately perpendicular to the row grade shall not exceed 0.5 foot per 100 feet. The allowable cross grade depends largely upon the type and stability of the soil, the size of the furrows to be used, and the planned row lengths.

Depending on cultural practices, cross slopes shall be such that water can be contained within the furrows to prevent breakthroughs from rainfall runoff.

Row lengths may vary but, where the minimum grade is planned, the following maximum lengths may be used as a guide: 660 feet for soils in Group 5 (Drainage Guide), up to 1,320 feet for better drained soils in Group 1. Where the row grade is 0.2 to 0.5 foot per 100 feet, the lengths of the rows can be 1,320 feet for any of the soil groups.

**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 foot, a permanent grassed area or border ridge must be left between the plots to reduce the possibility of gully erosion.

Where rows carry runoff directly into drainage channels over 2.0' deep, special erosion control measures, such as pipe drops, shall be considered.

**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.

**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.

## CONSIDERATIONS

Effects on the water budget, especially on volumes and rates of runoff, infiltration, deep percolation, and evaporation.

Short-term and construction effects of installation on downstream water resources.

Potential for earth moving to uncover or redistribute toxic materials, such as saline soils, and make them available to water or plants.

Effects on wetland hydrology and/or wetland wildlife habitat.

Potential impacts to existing utilities.

Locate and avoid underground utilities.

Effects on soil loss due to increased wind erosion potential and subsequent deposition.

## 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 purpose.

## OPERATION AND MAINTENANCE

Actions shall be carried out to insure that this practice functions as intended. Such actions include periodic checks of drainage structures (field ditches, grassed waterways, etc.) to insure that siltation is not occurring and performing minor maintenance to maintain the required field slopes.