

**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 Standard \(CPS\) 466, Land Smoothing](#), or [CPS 464, Irrigation Land Leveling](#).

**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. A topographic or grid map will be prepared with enough detail to make an adequate design of the system. 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 must 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.

Minimum field slope shall be 0.1 percent for a soil in the 0.1 intake family. Refer to [Section KS652.0204 in National Engineering Handbook Part 652 \(NEH 652\), Irrigation Guide](#), for a listing of soil intake families. If a soil is not listed, a soil scientist can make this determination. Maximum field slope for all soils should not exceed 0.7 percent.

Reverse grades in the direction of planned water flow shall not be permitted. Short, level sections are permissible to meet field conditions. Depending on cultural practices, cross slopes shall be such that water can be contained within the furrows to prevent "breakthroughs" from rainfall runoff.

**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.

**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.

Collection drains shall conform to the requirements of [CPS 607, Surface Drainage, Field Ditch](#). For surface drainage, use the requirements outlined in [CPS 464](#).

**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

Items to consider include the following:

- 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.
- Locating and avoiding 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

An operation and maintenance (O&M) plan shall be developed and reviewed with the landowner or individual responsible for operation and maintenance. The plan shall include periodic checks to ensure that siltation is not occurring on drainage structures (field ditches, grassed waterways, etc.) and shall require minor maintenance to maintain the required field slopes.

The [O&M plan sheet](#) can be used. Add site-specific recommendations as needed.