ANSI/ASAE EP302.4 FEB1993 (R2012)
Design and Construction of Surface Drainage Systems On Agricultural Lands in Humid Areas

American Society of
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Developed by the ASAE Surface Drainage Committee; approved by the ASAE Soil and Water Division Steering Committee; adopted by ASAE as a Recommendation December 1966; revised March 1972, March 1973; reconfirmed December 1977; reconfirmed and reclassified as an Engineering Practice December 1978; reconfirmed December 1983, December 1984, December 1985; revised December 1986; reconfirmed December 1991; revised February 1993; approved as an American National Standard August 1993; reaffirmed by ASAE December 1997, December 1999; reaffirmed by ANSI June 2000; reaffirmed by ASAE January 2001, February 2003; reaffirmed by ANSI February 2003; reaffirmed by ASABE and ANSI February 2008; reaffirmed by ASABE December 2012; reaffirmed by ANSI February 2013.

Keywords: Drainage, Erosion, Humid, Surface

1 Purpose

1.1 This Engineering Practice is intended to improve the design, construction and maintenance of surface drainage systems which are adapted to modern farm mechanization. It is limited to agricultural or farm-size areas, 259 ha (640 ac) or less, in the humid region of the eastern USA (see Figure 1).

Figure 1 – Key map for drainage curves
(Humid areas for eastern USA where surface drainage may be needed)

1.2 Surface drainage is normally required for efficient crop production on slowly permeable soils with restrictive topography. It is not required when excess water is removed naturally. Typical problem areas are glaciated areas, coastal plains, bottomlands, deltas, and old lake beds. Surface drainage may eliminate the need for subsurface drains under certain conditions. Surface drains also apply to farm mains used to collect water from field drains and subsurface drains.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this Engineering Practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Engineering Practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below. Standards organizations maintain registers of currently valid standards.

ASAE S268.4, Design, Layout, Construction and Maintenance of Terrace Systems

ASAE S526, Soil and Water Engineering Terminology

3 Definitions and Terminology

3.1 The following terms used in this Engineering Practice are defined in ASAE S526:

— bedding

— berm

— crowning

— diversion

— field drain

— field lateral

— interceptor drain

— land grading

— parallel system

— reverse grade

— row drain

— row grade

— surface drainage

— water leveling

3.2 For the purpose of this Engineering Practice only, the following terms are defined herein:

3.2.1 land smoothing: The process of smoothing the land surface with a land plane or land leveler to eliminate minor depressions and irregularities without changing the general topography.

3.2.2 cross slope: The slope perpendicular to crop rows.

3.2.3 farm main: An outlet ditch serving an individual farm.

3.2.4 pipe drop: A pipe, with or without headwalls, used as an erosion control structure at a transition to drop water into a deeper drain.