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Operation of Controlled Drainage Systems in Humid Regions

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Developed by the ASAE Design and Installation of Subsurface Drainage Committee; approved by the Soil and Water Division Standards Committee; adopted by ASAE March 1990; reaffirmed December 1994, December 1995, December 1996; reaffirmed for five years December, 1999; revised editorially March 2000; reaffirmed July 2005; periodic review extended two years January 2010; revised December 2013.

Keywords: Controlled drainage, Drainage Water Management

1 Scope and Purpose

1.1 This Engineering Practice is intended as a guide for the design, installation and operation of a drainage system and head control structures whose purpose is the efficient management of the free water surface in the soil for drainage. This Engineering Practice is limited to systems utilizing pipe drains or open ditches to effect artificial subsurface drainage.

1.2 Water management systems, when operated in a drainage mode, have the potential of improving surface water quality by increasing soil water storage available for infiltration thereby reducing runoff that may carry sediment and undesirable chemicals. When operated in the controlled drainage mode, reduction in drainage depth or volume may occur, thereby reducing nutrient export, specifically nitrate-nitrogen. In open ditch systems, reduction in phosphorus loss can occur due to sedimentation in the channel upstream of the control structure.

2 References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies unless noted. For undated references, the latest approved edition of the referenced document (including any amendments) applies.

ANSI/NFPA No. 70, National Electrical Code

ASAE EP480, Design of Subsurface Drains in Humid Areas*

ASAE EP481, Construction of Subsurface Drains in Humid Areas*

ASAE EP302, Design and Construction of Surface Drainage Systems on Agricultural Lands in Humid Areas

ASAE EP407.1, Agricultural Drainage Outlets- Open Channels.

*ASAE EP480 and ASAE EP481 under revision. To be replaced with ASAE EP260.

3 Definitions

3.1 Terminology common to controlled drainage is defined below.

3.1.1 controlled drainage mode: Mode of operating a water-table management system with water-table control structures adjusted to different depths at different times of the year to limit system discharge resulting from rainfall to maintain a free water surface within the soil profile and reduce nitrate delivery.

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