

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

**IRRIGATION SYSTEM, MICROIRRIGATION  
SUBSURFACE DRIP IRRIGATION**

*(No. and Acre)*

*Code 441*

**1. SCOPE**

This **General Specification** shall apply to **Subsurface Drip Irrigation (SDI) Systems** with permanent controller, filter, and appurtenance locations. The system shall include buried lateral lines, buried main and submain pipelines, buried supply manifold lines, buried flush manifold lines, flowmeter, and backflow prevention equipment.

The work shall consist of designing, furnishing and installing a SDI System including lateral lines, main and submain pipelines, supply manifold lines, flush manifold lines, filter system and control station plus needed fittings and appurtenances.

**2. LOCATION**

The Subsurface Drip Irrigation System and its components shall be located as shown on furnished drawings/map or as staked in the field.

**3. PUBLIC AND PRIVATE UTILITIES**

Utilities are defined to be overhead and underground power or communication lines, and pipelines. All utilities discovered to be in the work area are shown on the drawings or sketches. However, the absence of indicators on the drawings or sketches does not assure the nonexistence of utilities in the work area. The contractor is alerted to conduct his/her own search and discovery for utilities in order to lessen or avoid potential damages. **The owner/operator shall complete TX-ENG-80A UTILITIES INVENTORY and TX-ENG-80B COOPERATOR CONFIRMATION OF THE ONE-CALL SAFETY SYSTEM prior to layout or any ground disturbance and return it to a NRCS representative.**

**4. INSTALLATION AND MATERIALS**

All materials used in the installation of the Subsurface Drip Irrigation system shall be new and free from defects.

SDI Systems shall be designed using the lateral manufacturer's hydraulic design program or by other methods as approved by NRCS. All applicable manufacturer recommendations on the installation, flushing, and initial pressurizing of the system and individual system components shall be followed. Installation of all components of the SDI system will be in accordance with the design. Items such as lateral length and type, number of laterals per zone, and pipe size and location all affect the hydraulic performance and system efficiency. Any changes or additions to the design layout will be done in consultation with the designer and approved by NRCS prior to installation.

Laterals will have a minimum wall thickness of 12 mils and will be buried 10 inches or deeper. The emitter shall be installed with the orifice pointing up, allowing sediments and organic particles to settle along the bottom of the lateral line. Lateral line spacing shall be based on type of product, soil type and planned crop.

The irrigation water supply shall be tested by a certified water testing lab and assessed for physical and chemical constituents to determine suitability, compatibility, and treatment requirements for use in a microirrigation system in accordance with criteria in Reference A.

The components that comprise the control and filter station shall be constructed over a concrete pad with a minimum thickness of 4" inches using concrete with a 28-day compressive strength of 3,000 pounds per square inch. The concrete shall be reinforced with 6-inch by 6-inch by 10 gage welded wire mesh placed no more than 3- inches from the outer slab edge or with #3 or larger steel rebar placed in a maximum 1-foot by 1-foot square grid placed no more than 3- inches from the outer slab edge. The welded wire mesh or rebar shall be placed near the vertical center of the slab. Supports for filter station components, when utilized by the installer, will be constructed of durable materials such as steel, fiberglass, and high density polyethylene. PVC pipe and wooden blocks are not acceptable supports.

All electrical components, including wiring, boxes, and connectors at the control and filter station shall be supported off the concrete slab, installed in a workmanlike manner, and grounded with a grounding rod to insure safe operating conditions.

All electrical components, including wiring, boxes, and connectors, shall meet the requirements of the National Electrical Code based on the location and type of installation. Local electrical requirements may exceed those set by NEC.

After installation, the system shall be pressure tested at the system operating pressure. All leaks shall be repaired to insure a leak-free system.

#### ***5. SYSTEM AIR VACUUM RELIEF***

Adequate air/vacuum relief must be provided for in the SDI system to minimize soil ingestion back into the emitters during shutdown. This vacuum effect on shutdown and draining can be reduced by ensuring that properly sized air/vacuum valves are installed at all high points and summits of 2 feet or greater in the zone or block. Flush manifolds with 2 feet or greater elevation change shall be provided with air/vacuum relief at the high point. Air/vacuum relief valves shall be installed on both sides of all block or manifold control valves.

#### ***6. MAIN AND SUB-MAIN PIPELINES***

Main and sub-main lines shall be designed and installed according to NRCS, Conservation Practice Standard, Irrigation Water Conveyance, High-Pressure, Underground, Plastic Pipeline, Code 430DD and NRCS, Conservation Practice Standard, Irrigation Water Conveyance, Low Pressure, Underground, Plastic Pipeline, Code 430EE.

Minimum Depth of Cover: The pipe shall be installed at a sufficient depth below the ground surface to provide protection from hazards imposed by traffic crossings, farming operations, freezing temperatures, or soil cracking. The minimum depth of cover for pipe susceptible to any of these hazards shall be:

<u>Pipe Diameter</u> (Inch)	<u>Depth of Cover</u> (Inch)
½ through 2 ½	18
3 through 5	24
6 or more	30

Air-and-vacuum and pressure relief valves shall be installed at the end of the supply pipeline(s), upstream of the filter station components, to protect the filter station and supply pipeline(s) from air and water surge.

Main, submain, and supply manifold velocities shall not exceed 5 ft/sec velocity during normal system operation. During flushing, manifold (pipelines located downstream from a control valve) velocities shall not exceed 7 ft/sec velocity.

An automatic or manually operated valve shall be installed above ground at the ends of all mains, submains, and laterals to facilitate flushing.

Each flush manifold discharge outlet shall include a pressure gauge and/or Schrader valve tap.

### **7. CHEMIGATION SAFETY**

All applicable Federal, state and local laws and regulations in regards to backflow prevention shall be followed in the installation of the system) All irrigation distribution systems into which any type of chemical (except disinfecting agents) or other foreign substances will be injected into the water pumped from water wells shall be equipped with an in-line, automatic quick-closing check valve capable of preventing pollution of the ground water in accordance with TAC Title 16, Part 4, Chapter 76.1007.

### **8. OPERATION AND MAINTENANCE PLAN**

An operation and maintenance (O&M) plan shall provide specific instructions for operating and maintaining the system to ensure that it functions properly, including reference to periodic inspections and the prompt repair or replacement of damaged components. This O&M plan can be furnished by the installing dealer and/or product manufacturer.

### **9. MEASUREMENT**

The amount of the Subsurface Drip Irrigation System completed as specified will be determined by measuring the area, in acres to the nearest 0.1 acres.

**10. CONSTRUCTION DETAILS****REFERENCE**

- A. Fact Sheet for Water Testing (Assessment of Water Quality for Microirrigation),  
NRCS-Texas, 2009.

This construction specification, attached construction details, and the requirement for completion of a TX-ENG-80A UTILITIES INVENTORY and TX-ENG-80B COOPERATOR CONFIRMATION OF THE ONE-CALL SAFETY SYSTEM have been reviewed with me and I agree to install my SDI Microirrigation System according to these construction specifications.

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Landowner / Operator

\_\_\_\_\_  
Date