

Instructions for Completing Form KS-ENG-205

If designed by a professional engineer (PE) other than a Technical Service Provider (TSP), this certification statement is required to be signed: "To the best of my professional knowledge, judgment, and belief, these plans meet applicable Natural Resources Conservation Service (NRCS) standards." PE designs will be reviewed by NRCS and accepted.

In addition, the PE is responsible for construction inspection and checkout certification with this certification statement signed: "To the best of my professional knowledge, judgment, and belief this practice is installed in accordance with the plans and specifications and meets NRCS standards."

Non-PE designs will be checked, reviewed, and approved by NRCS. Construction inspection and checkout certification will be conducted by NRCS.

This form is to be filled out by NRCS personnel or the Technical Service Provider (TSP) working with the subsurface drip irrigation (SDI) dealer/supplier and the landowner as the design of the SDI system is developed.

The form lists the information that needs to be included in the design documentation including the following:

Name - Name of landowner/operator requesting design assistance

Ident. No. - Field or unit obtained from NRCS field office staff

Legal Desc. - Legal description of location where the microirrigation system is being installed

Designed by - Designer

Checked by - Person who checks this data sheet

Approved by - NRCS employee with proper engineering job approval authority or private PE in accordance with Conservation Practice Standard 441, Irrigation System, Microirrigation (in electronic Field Office Technical Guide [eFOTG], Section IV)

Date - Enter date when each item is signed. ("Designed by," "Checked by," and "Approved by")

Form KS-ENG-394 for irrigation water management - Required to verify that there is sufficient water to meet water needs during critical water use period of crops

Other items should be completed as listed on the form.

System Data

Water right - Indicate the gallon per minute (gpm) and acres water right for the land to be irrigated by the SDI system

Pump design flow rate - Reliable continuous water flow rate that will be available for the center pivot throughout the growing season. If the producer is unable to provide results from a pump test taken during the irrigation season within the past 3 years, then use a maximum of 80 percent of the pump flow rate provided. This should improve the probability of the zones functioning properly and maintaining the Coefficient of Uniformity (CU) throughout the irrigation season.

Irrigated by SDI system - Number of acres to be irrigated by the SDI system

Planned crops and rotation - Identify crops for use in determining peak water use requirements

Water quality analysis - Required for filtration system design and treatment of emitters (test to be performed at certified laboratory)

Application rate per zone - Water demand for each zone

Number of zones - Number of individual zones to be irrigated

No. watered concurrently - Number of separate zones combined for establishing maximum water demand

Planned irrigation rotation schedule - Frequency of irrigation for each zone

Mainline:

Pipe size - List the pipe size from the water source and filtration system to the submains.

Type - Is it polyvinyl chloride (PVC) or polyethylene (PE)?

Pressure rating - Stamped pressure rating of the pipe

Length - How long is the mainline?

Submain:

Pipe size - From the mainline to the head of the zones

Type - Is it PVC or PE?

Pressure rating - Stamped pressure rating of the pipe

Length - How long is the submain?

Submain (if different pipe size from other submain):

Pipe size - From the mainline to the head of the zones

Type - Is it PVC or PE?

Pressure rating - Stamped pressure rating of the pipe

Length - How long is the submain?

Flushline:

Pipe size - List the size for the flush lines at the lower end of the drip tape.

Type - Is it PVC or PE?

Pressure rating - Stamped pressure rating of the pipe

Length - How long is the flushline?

Drip tape (lateral):

Brand - Manufacturer of the drip tape

Inside diameter (ID) - If more than one size, provide all sizes.

Spacing - What is the spacing between drip tape lines?

Planned depth - How deep will the drip tape be placed?

Pressure rating - What is the pressure rating of the drip tape?

Maximum length - What is the maximum drip tape length (row length)?

Emitter:

Spacing - What is the distance between emitters?

Discharge - What is the design flow rate and the pressure associated with this discharge rate?

Factors - Manufacturer values for the specific drip tape. Cv - What is the coefficient of variability for the drip tape of the particular inner diameter? X - What is the X factor for the Darcy-Weisbach formula? K - What is the K factor for the Darcy-Weisbach formula?

Filter system:

Brand - Name of filter system and the model number

Capacity - What is the capacity of the filter system and what is the pressure loss across the filter?

Pressure at filter discharge - What is the pressure at the discharge of the filter?

Flow meter (water meter) - Brand of flow measurement device and the model number

Sand separator - What is the type of sand separator and the capacity of the unit?

Chemigation valve - Brand of the chemigation valve and the model number

Zone/Block Data

Zone number - Number of the zone to identify it from others for scheduling needs

Design zone inlet pressure (downstream of valve) - Pressure at the beginning of the zone

Average design (Qave) emitter discharge - Average flow rate and pressure for the emitters within the zone

Maximum emitter discharge - Maximum flow rate and pressure for any of the emitters within the zone

Minimum emitter (Qmin) discharge - Minimum flow rate and pressure for any of the emitters within the zone

Number of emitter (n) - Total number for the zone

Flow rate variation - Percent difference in the emitter flow rate from the average emitter flow rate

Emission uniformity (EU) - Calculated using the formula: $100 \times (1.0 - [1.27 (Cv/(n)^{1/2})]) \times (Qmin/Qave)$

Subsurface Drip Irrigation (SDI) - Checkout

Complete the last page of the form to document the checkout of the SDI irrigation system

SDI Installation Data

Complete and check the items listed - Provide documentation to support the installation procedures used, installed items, performance, and units installed

Complete remarks as needed

Checkout by - The person completing the checkout shall sign and date.

Audited by - The person reviewing the checkout documentation shall sign and date.