

NATURAL RESOURCES CONSERVATION SERVICE
DOCUMENTATION REQUIREMENTS FOR
IRRIGATION WATER CONVEYANCE, PIPELINE

CODE 430

Design Criteria

Design in accordance with the criteria listed in Conservation Practice Standard 430DD (Irrigation Water Conveyance, High-Pressure, Underground, Plastic Pipeline) or 430EE (Irrigation Water Conveyance, Low-Pressure, Underground, Plastic Pipeline) and National Engineering Handbook Part 652 (NEH 652), Irrigation Guide, KS652.0710(c) and KS652.0710(d). The pipeline should be installed at the location and serve the area as shown on the irrigation development plan or plan map for the irrigation system.

Surveys

Run a ground surface profile survey along the centerline of the proposed pipeline using standard engineering notes. Record notes on loose-leaf field notebook sheets (Forms NRCS-ENG-28 and NRCS-ENG-29), or field note sheets (Forms KS-ENG-37 and KS-ENG-37a). Take and record ground elevation shots at 100-foot intervals and at all significant breaks in grade that occur between the regular stations. The shots can be extended to 200-foot intervals if the ground is uniformly sloped or level. When tying on and extending existing pipelines, take ground elevation shots along these lines at all critical locations and at the water delivery point of the underground pipe system if this information is not known. Also, determine pipe diameter, type, pressure, and pressure rating of the old line.

Set at least one permanent bench mark (tie back to the bench mark used on the irrigation development plan). Set reference hubs or temporary bench marks as needed.

Locate and identify special conditions such as buried utility lines, roads, etc., which may affect the design and installation of the pipeline. Safety procedures listed in National Engineering

Manual (NEM) Part 503 should be strictly followed.

Layout

Generally, sufficient stations, alignment, and grade stakes will be set when the design survey is made to establish the location of the pipeline. In some cases, it will be necessary to set special reference stakes along the line after design and prior to pipe installation. These should be described in the survey notes.

Design and Plans

Develop the design in accordance with the "Design Criteria" Section. Design documentation may be in the form of a worksheet and plotted profiles. The final documentation for the pipeline design should show the following:

- Water requirements for the planned use, proposed capacity of the system, and required pumping time per day and month to meet needs - Complete Form KS-ENG-394 or equivalent.
- A ground surface profile along the centerline outlined in the "Surveys" Section.
- The design of the system at the maximum operating condition - Show the hydraulic grade line when the pipeline is operating at this condition. Plot extra grade lines as needed for lateral lines or special conditions. Calculate and list the maximum head or pressure in the pipeline. Also check and list the standing head or static head in any connecting pipelines that are subjected to pressure under the maximum operating condition. The hydraulic grade lines do not have to be plotted when the maximum operating conditions are shown adequately in the calculations.

Record design information on Form KS-ENG-23b as follows:

- Name of the owner and/or operator and location information
- Identify and show location of all fixture locations such as pump stands or doglegs, water source, air-vacuum relief valves, pressure relief valves, riser valves and gate valves, and other appurtenances. Show location and description of the pipe and appurtenances on the front side and details of the kind and amounts of materials in the "Table of Quantities" on page 2 - Additional sheets should be used as needed to show all details.
- The location map showing the plan view of the proposed pipeline with stations and important fixture locations - An attached map may be needed for larger systems.
- Any special instructions needed for installation of the pipeline

- Name of persons doing the layout and design and dates completed
- Signatures of persons responsible for the design check and design approval with the appropriate dates

Checkout

Complete Form KS-ENG-23b by recording the following:

- Linear feet of pipe installed for each pipe size
- Depth of cover over pipeline
- Installed location, size, and pressure rating of all appurtenances
- Record any observed markings from the pipe and appurtenances
- Signature of person doing checkout and date