

**GUIDANCE DOCUMENT**  
**Livestock Pipeline, Code 516**

**I. References**

A. Design Criteria

1. Georgia FOTG Section IV, conservation practice standard, Pipeline, Code 516.

B. Design/Layout Surveys

1. TR-62 Engineering Layout, Notes, Staking & Calculations.
2. NEFH Part 650, Chapter 1, Engineering Surveys.

C. Computer Software Design Aids

1. Georgia NRCS spreadsheet "Watering System Design".

**II. Documentation**

These instructions apply to a pipeline and required appurtenances.

A. Preliminary Investigation Determine the feasibility of the pipeline considering topography, source of water, location, etc.

B. Engineering Surveys All pipeline designs require sufficient topographic information to plan the pipeline location, determine quantity of pipe, need for appurtenances, and elevation differential to size the pipeline. Topographic maps are optional on land with slopes of 0.5 percent or flatter.

1. Engineering Surveys (when needed to adequately design the pipeline)

- a. Set and describe at least one temporary bench mark where necessary to determine elevation differences.
- b. Profile pipeline only where summits cannot be determined visually. Record location of water source and elevation of pump discharge pipe. Survey profile rod readings at all highs and lows and the distance between rod readings should not normally exceed 300 feet. The survey must be in sufficient detail to locate summits.

2. Aerial Topographic Maps

These may be used when they are in sufficient detail for all system components to be located and their elevations established within tolerances required by the conservation practice standard Pipeline, Code 516. Location of summits and control elevations on the pipeline are essential. A copy of the map must be a part of the system design.

3. Note the location of any utilities or utility markers.

C. Design

1. Determine the required capacity and quality of pipeline for the intended purpose(s).
2. Design shall be based on the required design flow rate and include friction losses and elevation head losses. Record all pipe sizing calculations, with references to tables, charts, and graphs used on NRCS-ENG-523A (or equivalent) or using approved computer programs.
3. Record design on form NRCS-ENG523A (or equivalent).
4. Develop engineering plans and specifications. As a minimum the plans and specifications shall include:
  - a. Location of pipeline.

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- b. Complete facility plan layout, cross sections and profiles showing dimensions and elevations.
- c. Material type, size, and pressure class for pipe and fittings.
- d. Location, size, type and pressure class for appurtenances (drains, vents, valves, outlets, pressure relief, thrust blocks, etc.).
- e. Depth of cover.
- f. Pipe trench/backfill requirements.
- g. Safety features for trenches, when applicable.
- h. Location of utilities and notification requirements.

5. Develop a site specific O&M Plan for the practice.

#### D. Construction Layout

Review the plans and specifications with the landowner and contractor prior to the start of construction. Ensure the landowner/contractor thoroughly understand their responsibilities including obtaining all permits, easements, etc. Record layout information in the engineering field book.

- 1. Set stakes at the beginning, changes in alignment or grade, and at the end.
- 2. Stake location of appurtenant structures.

#### E. Construction

Adequate site visits and checks shall be made during construction to verify that the plans and specifications are followed. Any changes in the design must be reviewed and concurred by the landowner and shall be approved by the designer and person with appropriate engineering design job approval authority.

#### F. Construction Checkout

##### 1. Pipeline

- a. Inspect the pipe to determine if it conforms to the specifications required in the design and plans with respect to manufacturer's identification, material type and grade, size, and working head.
- b. Record construction check data on the engineering plans, in the engineering field book, or other appropriate form. Construction documentation shall include the following:
  - (1) Lengths and size of each pipeline installed. The length of pipe will be measured by chaining, calibrated measuring wheel, GPS, or other equivalent method.
  - (2) Pipe class, pressure rating, etc. for all pipe installed.
  - (3) Size and location of all appurtenances such as air release valves, pressure release valves, etc.
- (4) Pipe depth of cover. Check depths at locations least likely to pass. A minimum of one check will be made on each pipeline but not less than one check for each 2,000 feet of pipe installed.

##### 2. Appurtenances

- a. Check appurtenant locations to make sure that they are installed according to plans. Record type, size, pressure setting, etc.

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- b. Check appurtenances as needed to determine if they will function as designed.
3. Compute quantities of pipeline and appurtenances.
4. Prepare as-built drawings showing final construction location, dimensions, details, etc., if significantly different from design drawings.
5. If the practice meets NRCS standards and specifications, then the statement "This practice meets NRCS practice standards and specifications" shall be placed on the checkout document and signed and dated by the responsible person with appropriate level of engineering job approval authority.

#### G. Reporting and/or Certifying

After it has been determined and documented that the practice meets NRCS plans and specifications, it can be reported and certified. The extent of the practice to be reported is the length in feet of pipeline installed. The extent of the practice certified is the quantities used as the basis for payment such as the length of each diameter pipe, fittings, etc.