

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**IRRIGATION WATER CONVEYANCE  
RIGID GATED PIPELINE**

(Ft.)

**CODE 430HH**

**DEFINITION**

A rigid pipeline with closely spaced gates installed as part of a surface irrigation system.

**PURPOSE**

To efficiently convey and distribute water to the land surface for better water management without causing excessive erosion, water losses, or reduction in water quality.

**CONDITIONS WHERE PRACTICE APPLIES**

This standard applies to the design and installation of rigid gated pipe. It includes aluminum and polyvinyl chloride (PVC) plastic gated pipe.

The rigid gated pipeline shall be planned and located to serve as an integral part of an irrigation distribution system that has been designed to help conserve soil and water resources on a farm. This practice shall not be used in lieu of buried pipelines for conveyance systems; however, reaches of ungated pipe may be used to obtain necessary working pressure for the system or to convey the water to various points.

**CRITERIA**

**General Criteria Applicable to All Purposes**

The water supply, water quality, and rate of irrigation delivery for the area shall be sufficient to make irrigation practical for the crop to be grown and for border, furrow, corrugation, or contour water application methods.

**Laws, rules, and regulations.** This practice shall conform to all federal, state, and local laws, rules, and regulations. Laws, rules, and regulations of particular concern include those involving water rights, land use, pollution control, property easements, wetlands, preservation of cultural resources, and endangered species.

**Working pressure.** The maximum working pressure shall be 10 psi or 23 feet of head. Design working heads in excess of 23 feet shall be controlled by installing orifice plate head reducers, butterfly valves, standpipes, or other appurtenances for head control.

**Friction losses.** For design purposes, friction head losses shall be no less than those computed by the Hazen-Williams equation, using a roughness coefficient of  $C = 130$  for aluminum pipe and  $C = 150$  for plastic pipe. A multiple outlet factor shall be used in computing losses only when it affects the design pipe size.

**Flow velocity.** The design velocity in the pipeline when operating at system capacity shall not exceed 7 ft/s.

**Capacity.** The design capacity of the pipelines shall be sufficient to deliver an adequate irrigation stream to the design area for the planned irrigation method.

**Outlet gates.** Individual outlet gates shall have the capacity at design working pressure to deliver the required flow to a point at least 0.3 foot above the field surface.

**Head requirement.** The working head shall not be less than 0.5 foot above the outlet gates unless a detailed design is complete to

indicate that a lower head requirement is adequate. Where stream flows are erosive, a "sock" shall be installed on each gate; or some other means of erosion control shall be provided.

**Flushing.** A surface outlet shall be installed at the terminal end of the pipeline if needed for flushing the line free of sediment or other foreign material.

**Quality of water.** Water quality shall be evaluated for all aluminum pipeline installations. A copper content in excess of 0.02 ppm produces nodular pitting and rapid deterioration of pipe if water is allowed to become stagnant. The pipeline should be drained after use. Provisions shall be made to prevent trash inflow into the gated pipeline.

**Materials.** Pipe materials shall equal or exceed the physical requirements specified under "Plans and Specifications."

## **RELATED STRUCTURES**

On-farm irrigation delivery systems shall meet or have a plan for improving the system to meet the appropriate Conservation Practice Standard 430, Irrigation Water Conveyance.

Appurtenances used to join the gated pipeline to the delivery system outlet must have adequate capacity at design working head to deliver the required flow.

## **PLANS AND SPECIFICATIONS**

Plans and specifications for installing gated pipelines shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.